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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. Direct inquiries to USDA NRCS, Plant Materials Center, 98 South River Road, Bridger, MT 59014, Phone 406-662-3579, Fax 406-662-3428; or Larry Holzworth, Plant Materials Specialist, USDA NRCS Montana State Office, Federal Bldg., Rm 443, 10 East Babcock Street, Bozeman, MT 59715-4704, Phone 406-587-6838, Fax 406-587-6761.

A Call for Field Plantings

The Plant Materials (PM) Program depends on landowner participation to field-test new selections of grasses, forbs, and woody plants. This happens by working with local conservation districts and NRCS field offices that are routinely in contact with local cooperators who show interest in looking at new plants and technologies. This unique relationship allows us to field-test new plant materials in a "real world" setting on farms and ranches in Montana and Wyoming.

The PM program has eight grasses, two forbs, two shrubs, and two trees in need of field testing in Montana and Wyoming. The grasses include switchgrass *Panicum virgatum* (9005439), Foothills Canada bluegrass *Poa compressa*, High Plains Sandberg bluegrass *Poa secunda,* Garnet mountain brome *Bromus marginatus,* 'Rush' intermediate wheatgrass *Thinopyrum intermedium,* 'NewHy' hybrid wheatgrass *Elymus hoffmannii,* 'Goldar' bluebunch wheatgrass *Pseudoroegneria spicata* ssp*. spicata,* and 'Bannock' thickspike wheatgrass *Elymus lanceolatus* ssp*. lanceolatus.* The two forb species are Great Northern western yarrow *Achillea millefolium* var. *occidentalis* and Stillwater prairie coneflower *Ratibida columnifera*. The shrubs are Open Range winterfat *Krascheninnikovia lanata* and Trapper Germplasm western snowberry *Symphoricarpos occidentalis*. The trees include Hunter Germplasm ponderosa pine *Pinus ponderosa* and Bridger Select Germplasm Rocky Mountain juniper *Juniperus scopulorum*.

The accessions of switchgrass, Canada and Sandberg bluegrass, and mountain brome, plus the forbs, shrubs, and trees, are all the newest plant materials identified to help solve the resource concerns listed in the Bridger PM long-range plan. Additional information on these plants can be found on the Montana or Wyoming NRCS home page under plants, then "field plantings and seed collections" or under "Bridger Plant Materials Center," then publications, then technical notes.

The 2007 list of seed availablility for field plantings can be accessed via the Montana NRCS website under plant materials, then field planting and seed availability. Montana applicants must submit requests on the form, MT-ECS-9 Field Planting Plan, which can also be accessed on the Montana NRCS website, under plants, then plant materials forms. Applications are due to Larry Holzworth no later than February 15, 2007. The Montana State Plant Materials Committee meeting is scheduled to occur jointly with the Montana State and Area Technology meeting planned for April 10-12.

In Wyoming, the 2007 list of seed availability for field plantings can be accessed via the Wyoming NRCS website under plants. Wyoming applicants will need to submit requests on the form, WY-ECS-54 Field Planting Plan, which also can be accessed on the Wyoming NRCS website, under government forms, then Wyoming ECS forms. Also complete and attach the form, WY-ECS-25 Seeding Application/As-built Spreadsheet. Applications are due to Larry Holzworth by February 15, 2007. The Wyoming State Plant Materials Committee meeting is tentatively scheduled for March 6-7.

By Larry Holzworth, Plant Materials Specialist.

Establishment and Seed Production of Native Wildflowers for Restoration Projects

Scientists and students in the Department of Land Resources and Environmental Sciences at MSU-Bozeman are collaborating with the NRCS Bridger PMC, in an evaluation and assessment of different weed management practices on the establishment, growth, and seed production of native wildflower species suitable for restoration projects. The information generated in this project will be valuable to professionals interested in commercially growing native forbs, as weeds represent a major threat in wildflower seed production, and there are very few recommendations for successful management.

The study will test a number of pre- and post-emergence herbicides for weed control and crop safety in two replicated wildflower seed production fields located at the Post Agronomy farm in Bozeman, MT, and at the PMC in Bridger, MT. At each site, five wildflower species, white prairie clover *Dalea candida*, blanketflower *Gaillardia aristata,* fuzzytongue penstemon *Penstemon eriantherus*, silverleaf phacelia *Phacelia hastata*, and prairie coneflower *Ratibida columnifera* were planted in October 2006. Prior to planting, trifluralin (Treflan), a pre-emergence herbicide was applied to the studied sites.

A screening of post-emergence products is currently being conducted in a greenhouse at MSU-Bozeman. Post-emergence herbicides being considered for use include, but are not limited to, imazapic (Plateau), halosulfuron (Sandea), clethodim (Envoy), and fluazifop P-butyl (Fusilade), linuron (Lorox), bromoxymil (Buctril), bentazon (Basagran), pendimethalin (Prowl) and clopyralid (Stinger). The four chemicals that show the least wildflower injury will be selected and applied as early as possible in 2007. The economic outcome of the different weed management programs will be evaluated to obtain an understanding of their cost trade off.

Overall, these studies will provide growers and land managers valuable information that will improve their ability to commercially grown native wildflowers in an economically feasible way. It will also clarify the impact of pre-existing weeds on the emergence and growth of native wildflowers.

By Jessica Wiese & Fabian Menalled, MSU-Bozeman.

New Release of Copperhead Germplasm Slender Wheatgrass

Copperhead Germplasm slender wheatgrass was released, as a selected seed class, by the Bridger Plant Materials Center in the summer of 2006. This release was made in cooperation with the Deer Lodge Valley Conservation District, and the Montana Agricultural Experiment Stations at Montana State University-Bozeman, and the Wyoming Agricultural Experiment Station at University of Wyoming-Laramie. A brochure is being developed and should be available by the summer of 2007.

Copperhead Germplasm slender wheatgrass is a selection from the Development of Acid/Heavy Metal Tolerant Releases (DATR) Project. The DATR Project operates under a state-funded grant, with the purpose of testing and selecting superior plant materials growing in heavy metal-contaminated soils on the Environmental Protection Agency's Clark Fork River Superfund Site at Butte and Anaconda. Copperhead Germplasm slender wheatgrass showed exceptional survival, growth, and vigor in study plots located on Stucky Ridge adjacent to the Moto-X area, just north of Anaconda.

Copperhead Germplasm slender wheatgrass produced 115 pounds of foundation-grade seed in 2006 that has been distributed to certified seed growers. Barring environmental disasters, commercial seed should be available in the fall of 2007.

By Shannon Majerus, DATR Project Leader.

Sub-Irrigation Tubes for Semi-Arid Environments

A sub-irrigation tube study was installed at the BPMC in May 2005 investigating the use of PVC pipe to deliver subsurface supplemental water to trees and shrubs. The project was initiated by Robert Kilian, NRCS Area Rangeland Specialist in Miles City, Montana, and funded in part by a Grazing Lands Conservation Initiative grant. The Montana Conservation Seedling Nursery in Missoula, Montana, is also partnering on the project. The Bridger study supports and supplements wildlife clump plantings installed in 2004 in eastern Montana that are testing sub-irrigation tube applicability on range sites. This concept is based on similar work conducted at the Los Lunas Plant Materials Center in New Mexico.

The potential benefits of and applications for sub-irrigation tubes is several fold. Deep, sub-surface watering may encourage deep rooting that may increase woody plant survival and growth, especially during periods of drought stress. It is possible deep watering may result in reduced soil surface evaporative losses, as hydraulic conductivity is reduced when moisture content of the surface strata dry out. In addition, sub-irrigation tubes may facilitate faster and more efficient supplemental watering, allowing landowners to drive up, apply water quickly, and then move on to the next tree without having to wait for infiltration. This would be particularly beneficial on heavy textured soils.

The Bridger study includes four species; green ash *Fraxinus pennsylvanica*, bur oak *Quercus macrocarpa*, ponderosa pine *Pinus ponderosa*, and Rocky Mountain juniper *Juniperus scopulorum*. These species were selected because they represent a good mix of root system habits and rates of growth. One study was installed under fallow conditions while the other was planted under a predominantly 'Critana' thickspike wheatgrass cover. Tubes were installed within approximately 10 inches of each seedling, and initially consisted of one, 4-inch diameter, 36-inch long PVC pipe with 2-inch horizontal slits spaced 2 inches apart along the length of the tube. A softball-size sphere of moistened bentonite clay was dropped into each tube to prevent excessive basal draining. Each tube was capped and held 1.9 gallons of water. Fifty percent of the trees were watered with tubes, the other half were

hand watered on the soil surface. The tube design was amended in 2006 with a solid 36-inch extension coupled to the existing tube, allowing greater storage capacity and a better distribution of water near the root zone of establishing seedlings.

Although it is too early to draw firm conclusions, several trends did emerge over the 2005 and 2006 growing seasons. The tubes did not improve the survival or growth rate on either site (vegetated or fallow) in 2005. Test excavations revealed that little water was reaching the small establishing root system in 2005. Almost no water appeared to be reaching the upper levels of the soil profile. To address this issue without relocating the tubes, extensions were added as previously described. In 2006, only green ash seedlings with tubes at the fallow site showed any superior growth over trees without tubes. It is presumed the fast growing green ash root systems were better positioned to take advantage of the supplemental moisture. An interesting development is the dramatic difference in height growth and vigor rating between the fallow and vegetated sites. All species, with the exception of the ponderosa pine in 2005, grew much taller and had higher vigor ratings, regardless of the manner in which supplemental water was delivered, on the fallow site. These results are a prime example of the benefits of herbaceous vegetation control when establishing tree and shrub seedlings – at least given Bridger site conditions (climate, soils, precipitation, etc.) and the amount of supplemental water we provided. Look for more detailed results later this summer in a Technical Note on the subject.

Although refinement of this technique will be necessary, the study should answer some fundamental questions regarding the potential usefulness of sub-irrigation tubes in the real world.

By Joe Scianna, PMC Horticulturist.