Bridger Plant Materials Center
Year 2002 Progress Report of Activities

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What is the Bridger PMC?

The Bridger Plant Materials Center (BPMC) is one of 26 Centers nationwide that use plants to solve natural resource problems. These problems include soil erosion, water quality deterioration, native habitat disturbance, mining and logging impacts, wildlife habitat loss, wetlands damage, and other conservation issues. Our work reflects the current needs of CRP, EQIP, WHIP, and other farm programs. Plant testing/selection and the development of new conservation technologies are the primary products of the program. The BPMC serves all of Montana and Wyoming.

Program Emphasis

Although the BPMC addresses many resource issues, our current program emphasis is in the following areas:

- Seed Production
- Windbreak and Shelterbelt Improvement
- Habitat Restoration and Enhancement
- Native Plant Propagation and Production

This document presents an overview of Year 2002 activities at the BPMC. For detailed information, contact the BPMC staff or Montana Plant Materials Specialist.

Seed Production

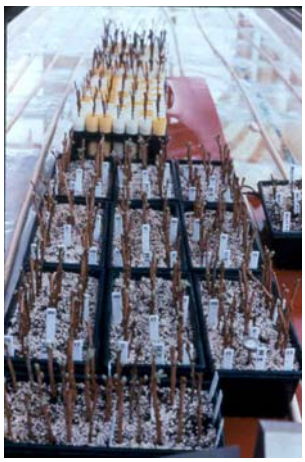
Seed production at the BPMC begins in mid-June with alpine bluegrass and continues until late October with winterfat and prairie sandreed. Foundation seed is distributed through the Montana and Wyoming Seed Certification programs, with the proceeds supporting graduate research at Montana State University and the University of Wyoming. A large portion of the cooperative work with the National Park Service (Glacier and Yellowstone Parks) and Deer Lodge Valley Conservation District (acid/heavy metal tolerant project) involves seed production and associated research.

COMBINING WINTERFAT

Category	No. Accessions	Pounds
Foundation	11	5,883
Initial Increase	18	126
YNP Reimbursable	19	522
GNP Reimbursable	7	40
Acid/Heavy-Metal Grant	18	360
Total:	73	6,931

1. Graduate Projects

Two graduate projects funded through the Foundation Seed graduate fund were conducted in cooperation with the BPMC in 2002. Cheryl Moore, working with Dr. Tracy Dougher, Montana State University-Bozeman, is investigating the vegetative propagation of bur from stem cuttings. Cheryl and the BPMC tested over 1,000 cuttings taken from the BPMC bur oak seed source study to establish baseline propagation percentages using conventional techniques. Novel approaches such as etiolation, blanching, hedging, and banding are planned for 2003.



BUR OAK CUTTINGS

Sarah Metcalf, working with Dr. Clain Jones, is examining the nitrogen fixing capabilities of native legumes. They will be establishing field trials at the BPMC, the Central Montana Agricultural Experiment Station-Moccasin, and the MSU Post Farm investigating the nitrogen fixation of American vetch, purple prairieclover, slender white prairieclover, lupine, northern sweetvetch and Canada milkvetch.

SLENDER WHITE PRAIRIECLOVER

The BPMC is assisting with another graduate research project that is being conducted by Myrna Ulmer from the University of Wyoming. Myrna is studying the effects of within-row spacing on the quality and quantity of prairie coneflower seed production. Although substantial information is available on the effects of between-row spacing on seed production, less is known about the influence of within-row competition. Replicated plots have have been established at the BPMC and Powell, Wyoming Experiment Station.

PRAIRIE CONEFLOWER

Windbreak and Shelterbelt Improvement

The BPMC's goal is to improve the performance of windbreak and shelterbelt plants in order to maximize benefits to the environment and consumers. This work includes the maintenance of seed orchards of released selections, and the continued testing of promising seed sources for potential release. In 2002, insect control efforts were initiated in the Bridger-Select Rocky Mountain juniper and Hunter Germplasm ponderosa pine seed orchards for juniper seed chalcid and Ips beetle, respectively. Applications of paraffinic oil at 2-week intervals appear to reduce chalcid damage to juniper seeds. Micro-injection of systemic insecticides in the pine orchard proved ineffective, and conventional topical sprays are planned for 2003.

Multiple evaluations of the bur oak seed source study were conducted in 2002 in preparation for seed orchard establishment in early 2004. Bur oak is a hardy, native tree providing a long-lived, strongly wooded alternative for windbreaks and shelterbelts. Data was collected on our 400-tree bur oak study including survival, height, width, vigor, form, number of leaders, habit, basal caliper, DBH, and seed production.

BUR OAK

Habitat Restoration and Enhancement

Habitat restoration work continued at the BPMC in 2002 and included the following projects:

1. Restoration of Roadside Disturbances in Yellowstone and Glacier National Parks.

RESTORATION IN YELLOWSTONE PARK

Since 1985 the BPMC has assisted Yellowstone and Glacier National Parks with the collection, propagation, and reestablishment of native indigenous plant materials along reconstructed roadsides. The Parks have utilized native plants to reduce soil erosion, compete with invasive plants, and improve the aesthetics on these disturbed sites. In 2002, the BPMC cleaned 305 wildland seed collections from the Parks and produced 562 pounds of seed of 26 collections. Presentations and papers titled *Nursery Cost-Estimating at the NRCS Bridger Plant Materials Center* and *Developing a Small-Scale Bareroot Production Nursery for Riparian Trees and Shrubs* were presented at Olympia, Washington, and Pablo, Montana, respectively.

2. Development of Acid/Heavy Metal-Tolerant Plants Project (Deer Lodge Valley CD).

Results from a greenhouse Comparative Evaluation Planting and Field Trials in the Anaconda area, provided data supporting the release of three accessions collected on low pH and heavy-metal laden sites near Anaconda, Montana. These pre-varietal releases are Washoe Selected-class Germplasm basin wildrye (*Leymus cinereus*), Old Works Source Identified-class Germplasm fuzzy-tongue penstemon (*Penstemon eriantherus)*, and Prospectors Selected-class Germplasm common snowberry (*Symphoricarpos albus).* These releases and other promising accessions will be further tested on an amended upland site near Anaconda in April 2003. Single species as well as indigenous and non-indigenous seed mixtures will be tested. Field plots comparing the performance of 19 woody indigenous and non-indigenous accessions is ongoing on a lowland site.

3. Rangeland and Mineland Restoration.

Since the BPMC was established in 1959, there has been an emphasis on the development of native plants for use on all disturbances on semi-arid grasslands and foothills of Montana and Wyoming. The BPMC continues to select native grasses, forbs, and shrubs to add species diversity to reclamation mixes.

BERRY FEP--SYDNEY, MT

Field demonstration plantings have been established at five locations in eastern Montana to evaluate introduced and both warm-season and cool-season native forages. Idaho fescue selections have been made and are being increased; one from western Montana, one from eastern Montana, and one from the Bighorn Mountains of Wyoming. Evaluation continues on Montana's state grass (bluebunch wheatgrass). Recurrent selection on 20 east-slope accessions will potentially provide a cultivar that is adapted for range and wildlife habitat restoration in the eastern plains of Montana and Wyoming. Other future releases include Gardner saltbush, western yarrow, bottlebrush squirreltail, blanketflower, prairie coneflower, dotted gayfeather, and silverleaf phacelia.

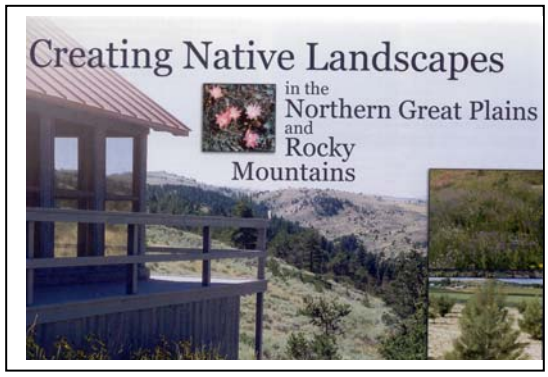
4. Wildlife Habitat Restoration and Enhancement.

Plant materials are being evaluated for upland game bird habitat, winter grazing for large ungulates, and native landscaping designed to attract wildlife. In cooperation with Ducks Unlimited, Pheasants Forever, and MT and WY Game & Fish Departments, the BPMC has

DUCKS UNLIMITED SEED PRODUCTION TRIALS

established test plantings to evaluate native plant mixtures and patterns of planting. Native species such as basin wildrye (*Leymus cinereus*), Indian ricegrass (*Achnatherum hymenoides*), and switchgrass (*Panicum virgatum*) are being used for perennial food and cover.

5. Low-maintenance Landscaping



Introduced dryland forage and native reclamation grasses are finding new uses--*xeriscaping*. These hardy, drought tolerant species have lower maintenance requirements than typical turf grasses. Plots of 11 potential xeriscape grasses established at the BPMC were evaluated in 2002 for growth and performance with and without mowing, as well as assessed for resilience to foot traffic. Our 15-page booklet titled *Creating Native Landscapes in the Northern Great Plains and Rocky Mountains* was revised in 2002 and 20,000 additional copies printed. The booklet walks homeowners through planning, design, site preparation, plant selection and care, water conservation, maintenance, and protection. This popular landscaping guide garnished a National Association of Conservation Districts Award in the Outreach category.

6. Culturally Significant Plants

An Inter-center Strain Trial was established to evaluate sweetgrass (*Hierochloe odorata)* from PMCs in the northern Great Plains. Plugs of sweetgrass from the PMCs in Michigan, North Dakota, Kansas, Colorado, and Montana are being compared to the released cultivar 'Radora' from South Dakota State University.

SWEETGRASS INTER-CENTER STRAIN TRIAL

Native Plant Propagation and Production

Numerous projects in 2002 involved propagation and production research with native plants. Work continued on separate projects with Rocky Mountain juniper, ponderosa pine, and bur oak to evaluate the seed production of individual seed sources from across the northern Great Plains. In 2002, new dormancy breaking trials or studies were initiated for 15 forb and 3 grass species being evaluated for habitat restoration at the USAF Base at Cheyenne, Wyoming in cooperation with the University of Wyoming. Little propagation and dormancy breaking information is currently available for many of these native plants. Forb species include rough pricklepoppy (*Argemone hispida*), Drummond's milkvetch (*Astragalus drummondii*), shaggy fleabane (*Erigeron pumilus* var. *pumilus*), alpine golden buckwheat *(Eriogonum flavum* var. *flavum*), shy wallflower (*Erysimum inconspicuum*), whiskbroom parsley (*Harbouria trachypleura*), little sunflower (*Helianthus pumilus*), stemless four-nerve daisy (*Tetraneuris acaulis* var. *acaulis*), dotted blazing star (*Liatris punctata*), silvery lupine (*Lupinus argenteus* spp. *argenteus* var. *argenteus*), white penstemon

(*Penstemon albidus*), broadbeard beardtoungue (*Penstemon angustifolius* var. *angustifolius*), upright prairie coneflower (*Ratibida columnifera*), blackeyed Susan (*Rudbeckia hirta* var. *pulcherrima*), and largeflower Townsend daisy (*Townsendia grandiflora*). Grass species include Indian ricegrass (*Achnatherum hymenoides*), needle and thread grass (*Hesperostipa comata*), and green needlegrass (*Nassella viridula*).

New Releases

In 2002 four new releases were made. The Acid/Heavy Metal-Tolerant Project released a basin wildrye, fuzzy-tongue penstemon, and common snowberry as previously mentioned. The Bridger PMC also released Open Range, a Tested Class Germplasm of winterfat (*Krascheninnikovia lanata*). This was a combination of three accessions originating in Prairie and Carbon counties of Montana, and Carbon county in Wyoming. There is a need for arid-land shrubs that can be included in native plant mixtures for mineland reclamation, wildlife habitat, and rangeland renovation.

WINTERFAT SEEDS--NATURAL & THRESHED

Technology Transfer

Technology transfer is all information that the Center provides through talks, tours, written materials, and other forms of communication. In 2002 four quarterly BPMC newsletters were published covering such topics as seedhead vivipary, alternate row plantings, new releases, insect control in trees, as well as numerous projects and activities. In addition to the quarterly newsletter, the staff Horticulturist has initiated 'HortNotes', periodic papers on pertinent conservation horticulture topics. Formal presentations were given at the Society for Range Management--Kansas City, MO; Native Plant Propagation Symposium--Eugene, OR; National Park Service Training Session--Seattle, WA; Seed Production and Conditioning Workshop--Fort Collins, CO; Parks Canada Native Plant Workshop, Swift Current, Saskatchewan; Native Plant Propagation and Restoration Conference--Olympia, WA; Native American Plant Propagation Workshop--Pablo, MT; and Master Gardeners--Casper, WY. PMC tours included Montana and Wyoming NRCS State Offices, various school groups, Wyoming Extension Service, garden clubs, Montana Certified Seed Inspectors, and Montana Nursery and Landscaping Association. A 3-day training session was also conducted for new NRCS employees from Montana and Wyoming.

DEMONSTRATION PLANTING AT ROY HIGH SCHOOL

A demonstration planting was established at the Roy School in central Montana. All grades in the Roy Elementary observed the morning activities and the Future Farmers of America students from Roy and Grass Range High Schools assisted in the afternoon. Once established the planting will be used for studying plant identification for FFA contests. Note; a soils pit in the above picture was used to explain soil morphology.

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