



## Bridger Plant Materials Center Year 2000 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:

- Windbreak and Shelterbelt Improvement
- Habitat Restoration and Enhancement
- Native Plant Propagation and Production
- Forage and Pasture Production and Management

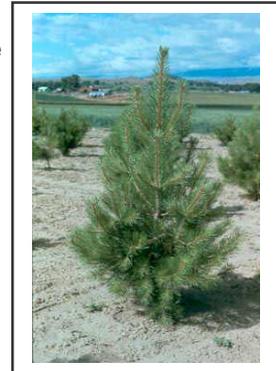
This document presents an overview of Year 2000 activities at the BPMC. For detailed information, contact the staff at the Bridger Plant Materials Center or the Montana Plant Materials Specialist.

### Windbreak and Shelterbelt Improvement

Improving the performance, diversity, and survivability of windbreaks and shelterbelts results in numerous conservation benefits such as soil erosion reduction, air and water quality improvement, wildlife habitat enhancement, agroforestry products, and more.

The BPMC's goal is to improve the performance of windbreak plants in order to maximize benefits to the environment and consumers. In 2000 the BPMC released a Select Class germplasm of ponderosa pine with impressive rates of growth and improved seedling survival.

Faster growing, better surviving plants mean that windbreaks function sooner, better, and save consumers time and money. This selection is already in production at the Montana Conservation Seedling Nursery and will be available to the nursery industry later this year.



PONDEROSA PINE

Rocky Mountain juniper is a drought tolerant and winter hardy species providing wind protection; soil stabilization; wildlife food, nesting, and cover; and reclamation benefits. Our selection, Bridger-Select, offers superior uniformity of shape, rate of height growth, and seedling survival. Seed collected from individual trees at

our Bridger-Select Rocky Mountain juniper seed orchard was used to gather production data and to provide seed for nursery stock production.

The BPMC will soon release a superior snowberry, an excellent native for use as a soil stabilizer, snow catch, and wildlife cover species. In 2000 the Bridger orchard was doubled in size using rooted cuttings of selected plants. An additional seed orchard was also established at the Montana Conservation Seedling Nursery in Missoula. Adequate seed production means that there will be enough seedlings available to meet the anticipated demand for this improved selection.

Bur oak is a hardy native tree that will provide a long-lived, strong wooded alternative for windbreaks and shelterbelts in the northern Plains. Data was collected on our 400-tree bur oak seed orchard again in year 2000 and included timing of bud break, survival, height, width, form, and seed production. This future release will offer an alternative to some weak-wooded species that are currently used in windbreaks.

### Habitat Restoration and Enhancement



RECLAMATION IN YELLOWSTONE PARK

Habitat restoration work continued at the BPMC in 2000 and included the following projects:

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

Since 1985 the BPMC has assisted Yellowstone and Glacier National Parks with the collection, propagation, and reestablishment of native indigenous plant material 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 2000 the BPMC cleaned 240 wildland seed collections from the Parks and produced about 500 pounds of seed of 31 collections. A cost matrix was developed to estimate the cost of seed and plant production based on potential production levels and degree of difficulty.

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



CONTAMINATED SITE AT ANACONDA, MT

The Deer Lodge Valley Conservation District has been awarded grants from the EPA Mine Waste Technology Program and the Montana Resource Damages Program to continue research on the selection of acid/heavy metal-tolerant plant materials. The DLVCD has two researchers stationed at the BPMC. Native plant material has been collected from areas impacted by past copper mining and smelting. The project has 19 grasses, 6 forbs, and 5 shrubs in increase and selections will be released to commercial growers through the Pre-Varietal Release program. Very little plant material adapted to Intermountain valleys and acid/heavy metal-contaminated soil is currently available to reclamationists.

#### 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. In 2000 High Plains Sandberg bluegrass and Antelope slender white prairieclover germplasms were released.



BLUEBUNCH WHEATGRASS STUDY

Evaluations of bluebunch wheatgrass were conducted on over 1400 individual plants, and testing will continue until 2003. Development of Montana's state grass will provide a high-quality forage alternative for wildlife and livestock. Testing of bluebunch wheatgrass and Idaho fescue will ultimately result in selections of these species adapted to areas in MT and WY east of the Continental Divide. Other future releases include Gardner saltbush, winterfat, western yarrow, bottlebrush squirreltail, blanketflower, prairie coneflower, dotted gayfeather, and silverleaf phacelia.

#### 4. Wildlife Habitat Restoration and Enhancement.



WILDLIFE ANNUAL FOOD PLOTS

Native 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 established test plantings to evaluate native plant mixtures and patterns of planting. In May 2000, the BPMC, in cooperation with the NRCS Montana State Biologist, established an Annual Food Plot study evaluating a variety of grains

and row crops as annual food crops. Thirteen species were seeded in strips and then cross-seeded so that each plot contained two species. Species tested include oats, wheat, barley, canary seed, pinto beans, Austrian winter pea, corn lentil, millet, sorghum, safflower, canola, and sunflower. Portions of the plots will be left to see if seed shatter will perpetuate the stands.

#### 5. Riparian Restoration

Two Source-Identified silverberry for stream-bank stabilization were released in 2000. This native, suckering shrub provides excellent stream channel protection, as well as wildlife cover. Dupuyer Stream-bank Germplasm silverberry is



SILVERBERRY

recommended for use at lower elevations, closer to water, whereas, Pondera Floodplain Germplasm silverberry is recommended for upland sites characterized by less soil moisture.

#### 6. 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 10 potential xeriscape grasses were established at the BPMC to compare growth and performance with and without mowing, as well as, to assess their resilience to foot traffic. A 14-page booklet describing the "how-to" of native landscaping is currently being developed and will be available for distribution later in 2001.

#### Forage and Pasture Management

A forage quality study established at the BPMC in 1996 continued in 2000. Twenty-nine collections of 14 native and introduced forage grasses are being evaluated for protein and other forage quality characteristics at different growth stages. Forage samples are taken ten times between May and November, then analyzed with NIRS (Near Infra-Red

Spectroscopy). The objective of this study is to determine optimum utilization periods for each species based on productivity and forage quality. The forage quality analyses and the development of NIR calibration curves for each species are being conducted by a Montana State University graduate student funded through the BPMC Foundation Seed Program. Many of the BPMC field trials are designed specifically to identify forage species that extend the grazing period, both earlier in the spring and later into the fall and winter months.

### Native Plant Propagation and Production

Numerous projects in 2000 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. Work continued in 2000 on a Rocky Mountain juniper seed-dormancy study to determine the most effective combination of treatments to break dormancy. Early results indicate that acid scarification may increase germination. Sweetgrass is a culturally significant plant historically used by Native American tribes in their religious and cultural activities. Field grown plants were transplanted to containers in anticipation of increasing the production of this species prior to release.



MIST BED

### Technology Transfer

Technology transfer is all information that the Center provides through talks, tours, written materials, and other forms of communication. In 2000, the BPMC published Plant Materials Technical Note No. MT-35, Description,

Propagation, and Use of Rocky Mountain Juniper, *Juniperus scopulorum*. An improved method of cleaning small lots of juniper seed was developed at Bridger and summarized in Plant Materials Technical Note No. MT-34. Release notices detailing the basis for selection and release of improved plant materials were published for Dupuyer Streambank and Pondera Floodplain silverberry, Antelope slender white prairieclover, and High Plains Sandberg bluegrass. Four quarterly BPMC newsletters were published covering such topics as creeping aster, sweetgrass, sheep fescue, and numerous projects and activities. Contact the BPMC or visit the Plant Materials website for copies.

### Foreign Exchange



MONGOLIAN FAMILY

The MT-WY Plant Materials Program has a long history of cooperative work with the Grassland Research Institute in Inner Mongolia and the Research Institute of Animal Husbandry in Outer Mongolia. In 2000, efforts continued with the establishment of Initial Evaluation Plots in Mongolia, and we are now consulting with several Chinese provinces on seed production and planting technologies. This exchange has involved trips to China and Mongolia by Plant scientists, as well as hosting visits by Chinese and Mongolian researchers at the BPMC. We hope that this exchange will result in germplasms of new species of dryland forages, especially drought-resistant legumes, that will benefit U.S. agriculture.

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