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.

Ponderosa Pine Seed Orchard Established

In 1989, the Bridger Plant Materials Center entered into a cooperative ponderosa pine provenance project organized by the GP-13 (Tree Improvement) subcommittee of the Great Plains Agriculture Council and coordinated by the ARS at Mandan, North Dakota. The goal of the study was to identify genetic variation among numerous populations of ponderosa pine collected across the Great Plains and to make selections of superior material based on those differences. The selected material would then be used to establish a seed orchard for the production of improved germplasm for use in further studies and in conservation tree production.

The Bridger study included 79 collections of ponderosa pine from Montana, Nebraska and South Dakota that were established in a Randomized Complete Block design replicated seven times with non-contiguous, multiple-tree plots, 1,491 test trees. Trees were evaluated for various parameters including survival, height, width, vigor, damage, form, color, density and branch angle. In 1995, a "field rating" of each tree was conducted and 329 plants were "selected" based on their overall appearance and performance in the field. In 1996, data collected annually from 1989 through 1995 was used to identify individuals and families with superior survival, height and vigor. As a result, 202 "final selections" were picked from the pool of "field selections" made in 1995.

A seed orchard planting plan was developed in early 1996 with the help of USFS geneticist Lars Halstrom that was designed to separate related trees and thereby avoid inbreeding depression. With the help of numerous volunteers from field and state offices, conservation districts and the county extension service, all 202, 6-11 feet tall trees were transplanted into the orchard using two, 45 inch tree spades. Early indications are that transplanting survival will be very good. Follow-up care includes regular watering and periodic fertilization with high phosphorus solutions.

Thanks to all those that helped make this project a big success including Matt Marsh, Susan Winslow, Mark Majerus, Bruce Thompson, Geri Sullivan, Robin Fuson, Linda Peterson, Connie Reynolds, Chuck Roloff, Greg Evertz, Gary Buckingham, Darryl Krum, Larry Holzworth, Bob Logar, Hal Hunter, Rick Fasching and Pete Husby. Your efforts are greatly appreciated.

Joe Scianna

Release of 'Rimrock' Indian ricegrass

In April 1996, the Bridger Plant Materials Center, in cooperation with the Montana Agricultural Experiment Station-Bozeman, the Wyoming Agricultural Experiment Station-Laramie, and the USDA Agriculture Research Service-Logan, Utah, released 'Rimrock' Indian ricegrass [*Oryzopsis hymenoides* (Roem. and Schult.)Ricker ex Piper]. The original collection was made from a native, sandy range site north of Billings, Montana, at an elevation of 1,101 meters.

Rimrock (tested as M-33, P-15597, T-05424, 9005424, and PI-478833) has been extensively tested in comparative trials with 'Paloma' (origin-Pueblo, CO) and 'Nezpar' (origin Idaho). Rimrock was similar to the other two releases in overall establishment and survival on most test sites; however, Rimrock had better performance and longevity on the more droughty sites in Montana and Wyoming. The primary reason for releasing Rimrock was the increased seed production and its better seed retention than either Paloma or Nezpar. The seed retention is attributed to the mean glume angle. At seed maturity, the glumes of Paloma open up to an average angle of 48°, while Rimrock only opens to 28°. Studies by the ARS-Logan found that the seed retention index for Rimrock was 2.4 and 4.1 times that of Nezpar and Paloma, respectively. Seed production at the Bridger PMC has ranged from a low of 106 kg/ha to a high of 841 kg/ha with a 17-year average of 313 kg/ha. In a

study at the Agricultural Research Center at Kalispel, Montana, the seed production of Rimrock was 1,235 kg/ha, while Nezpar and Paloma produced 769 kg/ha and 311 kg/ha, respectively. The increased seed production and the reduced seed shatter makes Rimrock more desirable to commercial seed producers.

Rimrock Indian ricegrass provides excellent food for upland game birds and songbirds. This grass can be planted with or adjacent to taller plants for food and cover for a variety of wildlife. The plump seeds have a protein level of 15% to 17%. Seed production fields attract numerous mourning doves (*Zenaidura macroura*). The forage of Indian ricegrass is relished by livestock and wildlife during the active growing season as well as during the dormant winter period. Indian ricegrass can also be used in seed mixtures for reclamation of disturbed sandy soils.

Mark Majerus

Chemicals for Grassy-Weed Control in Grass Seed Production Fields

Annual grassy weeds such as downy brome (*Bromus tectorum*) and hairy chess (*Bromus commutatus*) can create serious problems in grass seed production fields. These weed seeds are difficult, if not impossible, to clean from seed of most wheatgrasses and wildryes. There are very few chemicals that are specifically labeled for use on grasses grown for seed production.

Studies were established at the Bridger Plant Materials Center, and the Powell, Wyoming Research and Extension Center in cooperation with Dr. Tom Whitson, Extension Weed Specialist, University of Wyoming. These studies were designed to evaluate 14 chemical treatments for downy brome control and extent of crop damage. Each test plot consisted of two rows of seeded downy brome and four rows of established grass crop. The crops included in the trials were 'Bozoisky-Select' Russian wildrye (*Psathyrostachys juncea*), 'Shoshone' beardless wildrye (*Leymus multicaulis*), 'Critana' thickspike wheatgrass (*Elymus lanceolatus* spp. *lanceolatus*), 'Rosana' western wheatgrass (*Pascopyrum smithii*), 'Pryor' slender wheatgrass (*Elymus trachycaulus* spp. *trachycaulus*), and 'Regar' meadow bromegrass (*Bromus biebersteinii*). All chemical applications were made to dormant; established perennial grasses and fall planted downy brome in late October or early November except Roundup® and Cyclone®, which were applied in April after the perennial grasses had broken dormancy and the downy brome was actively growing in the 4-to-6 leaf stage (table 1).

Cyclone® and Roundup® treatments were tried as a non-dormant salvage treatment. Cyclone had good downy brome control, but extensively damaged the grass crops. With Roundup there was only a slight reduction in seed production, but downy brome control was inadequate. Of the dormant, fall-applied chemicals, the best weed control was with Sencor® at the 0.38 and 0.5 lb ai/A rates and with the Goal® + Sencor® combination. The highest rate of Sencor® (0.5 lb ai/A) slightly damaged the crops, particularly western wheatgrass, slender wheatgrass, and beardless wildrye.

Based on the results of these studies, both Montana and Wyoming granted 24C special use labeling for the use of Sencor 75 DF® at the 0.38 lb ai/A rate on perennial grass seed production. This gives the seed producers of Montana and Wyoming an additional tool for the control of problem weeds in their grass seed production fields.

Mark Majerus

Table 1. Average downy brome control and perennial crop damage with fourteen chemical treatments, six perennial grass species and four replications at the Bridger Plant Materials Center and the Powell Research and Extension Center. 1993 through 1995.

Chemical Name	Brand Name	Rate	Downy Brome Control	Crop Damage
		lb ai/A	%	%
Paraquat	Cyclone	0.7	99.7	96.2
Glyphosate	Roundup	0.25	50.9	34.5
Trifluralin	Treflan	1.0	16.5	9.0
Clomazone	Command	0.25	78.7	3.0
Pronamide	Kerb	0.25	56.7	2.8
Ethofumesate	Nortron	0.75	58.3	3.8
Pendimethalin	Prowl	2.0	43.5	1.7
Ethalfluralin	Sonalan	1.5	70.5	1.2
Oxyfluofen	Goal	1.0	73.0	2.0
Oxyfluofen + Metribuzin	Goal + Sencor	1.0 + 0.25	95.2	4.0
Metribuzin	Sencor	0.25	79.5	1.8
Metribuzin	Sencor	0.38	97.6	4.1
Metribuzin	Sencor	0.5	97.6	12.7
Dicamba + Atrazine	Marksman	0.25 + 0.5	56.8	14.2