



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 releases, establishment techniques, seed collection, and field planting needs, etc. Direct inquiries to USDA NRCS, Plant Materials Center, RR2 Box1189, 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

Another Horse in the Stable

In the past, it has been difficult to find native legumes and forbs for native seed mixtures. Only 'Appar' Lewis flax and 'Kaneb' purple prairieclover were available from commercial growers. All other forb seeds were wildland collected, often expensive, variable quality, and in short supply. In 2000, the Bridger PMC released Antelope Tested Class Germplasm of slender white prairieclover. After a good harvest in the summer of 2002, seed of this native legume is now commercially available for inclusion in native seed mixes. Antelope was originally collected near Dickenson, North Dakota. It is adapted for use in the prairies ecosystems of the Northern Great Plains. It prefers sandy to sandy loam soils, but has performed well on clay-loams as well.

Graduate Studies at the Bridger PMC

All Foundation seed of Bridger PMC plant releases is given to the Foundation Seed programs at Montana State University and the University of Wyoming, who, in turn, sell it to commercial seed producers. The income from seed sales is used to finance graduate projects at these universities. Presently, the Bridger PMC is assisting three graduate projects:

◆ Cheryl Moore, working with Dr. Tracey Dougher, MSU-Bozeman, is investigating the vegetative propagation of bur oak from stem cuttings. They are testing conventional methods, as well as novel approaches such as etiolation, blanching, hedging, and banding.

◆ Sarah Metcalf, working with Dr. Clain Jones, MSU-Bozeman, is examining the nitrogen-fixing capabilities of native legumes (American vetch, northern sweetvetch, Canada milkvetch, lupine, purple prairieclover, and white prairieclover). Field trials will be established this spring at the Bridger PMC, Central Agricultural Experiment Station-Mocassin, and the MSU Post Farm-Bozeman.

◆ Myrna Ulmer, working with Drs. Tom Whitson and Alan Gray, University of Wyoming, is studying the effect of within-row and between-row spacing on seed production of prairie coneflower. She is also examining various techniques to break seed dormancy of native grasses and forbs collected on the F.E. Warren Air Force Base at Cheyenne, WY.

Mark Majerus

Seed Collection List for 2003

The Plant Materials (PM) Program is requesting seed collections of four species in Montana and Wyoming. NRCS Field Office personnel, and other interested collectors, are being called upon to participate in the 2003 collection of fuzzytongue penstemon *Penstemon eriantherus* ssp. *eriantherus* (PEERE), silverleaf phacelia *Phacelia hastata* (PHHA), scarlet globemallow *Sphaeralcea coccinea* (SPCO), and American vetch *Vicia americana* (VIAM). The annual collection bulletin will be in field offices by June 2003, and will contain an attachment outlining the areas of each state that still need species representation (see table below). Seed collections are planted in evaluation studies to test performance and utility for solving conservation problems outlined in the Long-Range Plans for Montana and Wyoming. For more information call Larry Holzworth.

State	Natural Resource Area	Species Code
Montana	Columbia Basin	PEERE
		SPCO
		VIAM
	Headwaters	PEERE
		SPCO
		VIAM
	Upper Missouri	PEERE
		PHHA
		VIAM
	Lower Missouri	PEERE
PHHA		
VIAM		
Lower Yellowstone	PEERE	
	SPCO	
	VIAM	
Wyoming	Northern	PEERE
		PHHA
		SPCO
	Southwestern	PHHA
		VIAM
		PHHA

Bridger PMC 2002 Seed Production

The final seed production numbers have been tallied and the seed is in the barn. The PMC harvested numerous seed crops last year, despite continuation of a 5-year drought. Seed harvest began in mid-June with sweetgrass and continued until late October with winterfat. The PMC is responsible for providing Foundation Seed of commercial releases to seed and plant producers through the Montana and Wyoming Foundation Seed programs. A large portion of the cooperative work with the National Park Service (Yellowstone and Glacier) and the Deer Lodge Valley Conservation District (Development of Acid/Heavy Metal-Tolerant Cultivar project-DATC) involves seed production. In addition, plant materials that originated from field office

collections are maintained, harvested, and advanced through the stages of testing, evaluation, and increase for future release to the commercial seed industry for solving conservation problems.

Category	No. Accessions	Pounds
Foundation	11	5,883
Initial Increase	18	126
YNP Reimbursable	19	522
GNP Reimbursable	7	40
DATC	<u>18</u>	<u>360</u>
Total:	73	6,931

Susan R. Winslow

Tips for Successful Seedings

Springtime in the Rockies is the most common season for planting agronomic crops and forages, and for installing conservation practices. There are many practical aspects to consider, with emphasis on careful planning and timely preparation. Several very important steps in the process include (but are not limited to) the following:

1). Choose the right plant for the right site and purpose. Species selection is based on matching plant characteristics to environmental conditions while protecting the soil resource. The annual amount and seasonal availability of precipitation is the primary factor associated with plant growth and survival. Cool-season grasses require adequate amounts of moisture in early spring to complete maturity by summer. Warm-season grasses rely on enough mid spring moisture to mature by late summer. Blue grama requires a minimum of 5" precipitation to establish, crested wheatgrass needs 9", little bluestem requires 12", while timothy has to have at least 18".

Perhaps equally important to plants is the edaphic factor. Soil attributes such as pH, texture, salinity, and water-holding capacity influence establishment, productivity, and longevity. Distribution of a species is limited by physiogeographic regimes. Average annual minimum temperature as it relates to growing season is a critical issue in determining plant adaptation. Plants are rated for their ability to survive cold temperatures and the USDA map of cold hardiness zones is an excellent tool for assessing potential areas of adaptation. Montana and Wyoming are mostly in Zones 4 and 3 (-25° & -35° F) along with lesser regions in Zones 5 and 2 (-15° & -45° F). Some plants are inherently better than others at filling a niche. Basin wildrye is terrific cover for wildlife, but totally unsuitable for summer grazing. Winterfat is an excellent winter protein source for large ungulates, but not an option for pasture and hayland production.

2). Prepare the seedbed well in advance of the anticipated planting date. Existing conditions at the site, along with equipment availability, will determine the level of mechanical disturbance needed to prepare a good seedbed. If a previous crop needs to be removed, the field will require a higher level of tillage than an area that has been fallow, or it can be drill-seeded with a minimum tillage operation. If conventional tillage is used, the entire planting area should be free of clods and weeds, smooth, firm, and moist. Use of some sort of packing implement will probably be required to achieve the correct degree of firmness. A seedbed is properly firmed when walked across and footprints sink no more than 1/8 inch deep. Seeding depth will be more accurately controlled and seed:soil moisture relationships more favorable with a properly firmed seedbed. In areas with high water tables, or when other springtime operations take precedent, site preparation in late fall may be necessary.

3). Plant high quality seed at the correct depth and rate, and use the best planting equipment available. The purchase of certified seed is money well spent, as the blue seed tag provides assurance of varietal performance. Included is a lab analysis with percentage by weight of pure live seed (PLS), consisting of germination

viability, presence of other crops and weeds, and purity. Buying seed based on PLS, rather than on bulk amount, is more cost efficient because only healthy, viable seed is purchased; not all the other ingredients such as dust, chaff, empty seed, or weeds, commonly found in a bag of seed.

The seeding date for most grasses and legumes (some forb species) should be as early in the spring as possible, no later than May 15. This way, seeds can take advantage of spring moisture, the lack of weed competition, and reach an advanced stage of growth and development prior to summer heat or freezing temperatures later in the year. Indian ricegrass and several hard-seeded forbs are exceptions and must be dormant-seeded after October 15. No matter the date, there should be a minimum of 2 feet of available soil moisture for successful plant establishment.

Forage and range species have very small seeds that germinate and emerge slowly, so maximum seeding depth is very shallow, 1/4 to 1/2 inch (tiny seeds 1/8 to 1/4 inch). A good starting point for a drill-seeded rate is 25 PLS seeds per square foot, with an increased rate on poorly prepared or unfavorable sites. Seeding rates are often listed by species in pure stands as total pounds per acre, e.g. Sandberg bluegrass at 2 PLS lb/ac or mountain brome grass at 10 PLS lb/ac. Critical area plantings and broadcast seeding method rates should be doubled. The rate for a mixture is calculated according to percentage composition of each species in the mix.

Planting seed with a double disk drill equipped with depth bands is preferred because of precise seed placement, optimal seed to soil contact, and minimal seed waste through controlled distribution. When planting species mixtures, it's best if drills have multiple seed boxes for separating different sizes of seed and agitators to prevent lodging in the seedbox. Row spacing for most species should be 12- to 14-inches, with wildryes requiring at least 18- to 24-inch widths. Broadcast seeding is done by hand, from a helicopter or airplane, and air-blast and hydroseeders. It is an ideal method for small areas or in rugged terrain. Broadcasting can result in lower stand establishment and higher seed costs. Planting of a companion crop is not often recommended due to competition for nutrients, water, and light. Grasses do not compete well, which results in reduced seedling vigor and growth, and possibly a shorter productive stand life.

4). Apply timely irrigation, weed control, and fertilizer. Irrigated plantings need supplemental irrigation based on a soil's water-holding capacity, plant rooting depth and water use, and current climatic conditions. A rule of thumb is that irrigation (or natural precipitation) is required when approximately 50% of the water has been depleted from the root zone. If possible, avoid surface crusting (restricts seedling emergence) with light, frequent sprinkler applications of water. New seedlings have a much better chance for success when weeds are kept to a minimum. Mowing (to a grass height of 4-6 inches) and hand pulling are effective means of weed removal on grass plantings. Broadleaf herbicides, such as 2,4-D and dicamba, cannot be used on young grasses until the five leaf stage. Soil tests should be conducted to determine levels of nitrogen, phosphorus, potassium and sulfur prior to seeding, and then applied before planting at the appropriate rate. Use of nitrogen fertilizer on newly established grass plantings is generally not advised. Perennial grasses are slower to establish, and only annual grasses and other weeds would benefit from added nutrients. Nitrogen is essential to maintain high yields and quality, and should be annually applied in the spring. Depending on soil tests and production potential of the site, nitrogen rate recommendations vary from 50 lb/ac to 200 lb/ac.

5). Look in the FOTG for details on technical standards and specifications. Furthermore, state office specialists and plant materials staff are good resources for additional information.

Susan R. Winslow

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