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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.*

## Field Office 2005 Seed Collection List

The Plant Materials (PM) Program is requesting seed collections of eight species in Montana and Wyoming. In the 2006, continued collection is requested of the following species (numbers denote the total number of collections received since 1998): fuzzytongue penstemon *Penstemon eriantherus* ssp. *eriantherus*--7, silverleaf phacelia *Phacelia hastata*--12, scarlet globemallow *Sphaeralcea coccinea*--25, and American vetch *Vicia americana*--7. There were six new legumes species added in 2005 to address emerging conservation concerns. These include milkvetch species *Astragalus*--1, groundplum milkvetch *Astragalus crassicaarpus*--4, silverleaf Indian breadroot *Pediomelum argophyllum* (synonym *Psoralea argophylla*)--0, large Indian breadroot *Pediomelum esculentum* (synonym *Psoralea esculenta*)--3, slimflower scurfpea *Psoralidium tenuiflorum* (synonym *Psoralea tenuiflora*)--1, and prairie thermopsis *Thermopsis rhombifolia*--5. Some of the species lack collections from certain geographic areas in Montana and Wyoming. That information can be viewed by following the steps below and opening the "Table of Areas Needing Species Representation."

A bulletin will be distributed electronically to every field office in Montana and Wyoming to provide guidance on accessing the seed collection instructions via each state's homepage. For immediate access to the respective guidance documents, species descriptions, and photos, go to the respective website and click on Plant Materials, and then the Seed Collection List. Seed is subsequently planted in evaluation studies to test performance and utility for solving conservation problems outlined in the Long-Range Plans for Montana and Wyoming.

*By Larry Holzworth, Plant Materials Specialist.*

## 2005 Commercial Seed Production of NRCS Releases in Montana and Wyoming

In Montana and Wyoming, the 2005 estimated commercial seed production of certified and common seed of all Natural Resources Conservation Service (NRCS) released cultivars and germplasms totaled 1,553,298 pounds, or 52% of 2004 production. Sale of this seed generated revenues of \$4,746,139. Montana growers produced 1,133,623 pounds of 24 releases, generating \$3,331,564 or approximately 70% of the total dollars of all NRCS releases produced in Montana & Wyoming. Wyoming growers produced 419,675 pounds of 27 NRCS releases worth \$1,414,575-- which is about 27% of the total pounds and 30% of the total monies of all NRCS releases produced in Wyoming and Montana. In 2005, Wyoming revenues were up almost 15% higher than 2004.

The most dollars generated from seed sales in Montana was for 'Rimrock' Indian ricegrass (21%), 'Bozoisky-Select' Russian wildrye (18%), 'Rosana' western wheatgrass (8%), and 'Critana' thickspike wheatgrass and 'Goshen' prairie sandreed (7%). In Wyoming, Critana thickspike wheatgrass (17%), Bozoisky-Select Russian wildrye (15%), 'Arriba' western wheatgrass (10%), Rosana western wheatgrass (9%), and 'Chemung' crown vetch (7%) accounted for the majority of the dollars generated from seed sales.

Seed of these conservation plants was available on the commercial market for conservation plantings of pasture, Farm Bill Programs, erosion control after wildfires, roadside revegetation, mined land reclamation, etc. The amount of revenues generated by the commercial seed production of NRCS conservation plants provided a viable enterprise for Montana and Wyoming farmers.

*By Larry Holzworth, Plant Materials Specialist.*

## Irrigated Pasture/Hayland Trial

In spring of 2004, the Bridger PMC established replicated plots to compare 16 individual native and introduced grasses and two mixtures in solid stands, and in alternate rows with alfalfa. During the 2005 growing season, the plots were sampled on July 13<sup>th</sup> and October 31<sup>st</sup>. Worth noting is the fact that almost all grasses produced as much forage, or more, when grown in alternate rows with alfalfa as compared to solid stands, even though there were only half as many rows of grass with the alternate-row configuration. The following data is a combination of the two harvests in 2005 and lists production of grass grown in solid stands (8" row spacing), production of grass in alternate rows with alfalfa, and the total combined production of grass and alfalfa in alternate rows. The warm-season grasses did not establish good initial stands, and the wildryes are developing slowly but are expected to improve their performance.

	Solid Grass lb/ac.	Alt.Row Grass lb/ac.	Grass/Alfalfa Total lb/ac.
western w.g.	5,169	6,482	10,669
creeping foxtail	4,513	4,769	10,669
tall w.g.	7,280	7,161	10,435
hybrid w.g.	6,669	7,084	10,037
intermediate w.g.	5,940	6,224	9,897
pubescent w.g.	6,484	5,088	9,272
Mix 2 (5 spp.)	5,319	5,799	8,806
tall fescue	5,140	5,383	8,473
orchardgrass	4,003	4,198	8,280
Mix 1 (2 spp.)	3,629	4,062	8,226
timothy	5,584	4,540	8,067
meadow brome	4,385	4,640	7,887
smooth brome	6,489	5,207	7,821
beardless wildrye	2,140	1,224	7,690
Altai wildrye	1,976	1,316	6,988
basin wildrye	1,407	982	6,038
switchgrass	530	87	5,491
big bluestem	48	84	4,725

The top performing grasses were tall wheatgrass, western wheatgrass, and 'NewHy' hybrid wheatgrass, producing 3 to 3.5 tons per acre of oven-dry forage and producing over 5 ton of total grass/alfalfa forage. Mix 1 was a simple mix of meadow brome grass and orchardgrass, while Mix 2 was more complicated, being made up of equal proportions of smooth brome, orchardgrass, intermediate wheatgrass, tall fescue, and creeping foxtail. Complex mixtures similar to Mix 2 are commonly recommended for hay and pasture but they

often become dominated by smooth brome and deteriorate after a few years. Simple mixes such as Mix 1 have reportedly lasted longer and have been more productive over the long run. Although Mix 2 was more productive than Mix 1 in the second year of the stand, we hope to show that as the stands grow older the simple mix will eventually be the most productive.

*By Mark Majerus, PMC Manager.*

## Plant Profile: Sainfoin

There is a renewal of public interest in sainfoin, which is partly explained by increased haying costs, declining hay prices, prolonged drought, the desire to include a non-bloat legume component in a pasture production system, and to a lower seed price.

Sainfoin *Onobrychis viciifolia* was first planted in the U.S. around 1900, but the early introductions from Western Europe were not adapted and most of the plantings failed. It wasn't until 1964, with Montana State University's commercial release of the improved variety, 'Eski', and 1971, with their release of 'Remont', that establishment was successful and the value of the crop understood.

Sainfoin is a long-lived, deep-rooted, perennial legume that does not cause bloat when consumed by domestic livestock. It is a drought-tolerant forage crop adapted to medium-textured, calcareous soils in areas receiving a minimum of 13 inches of annual precipitation. Sainfoin does not tolerate saline, wet, or high water-table conditions, and it is susceptible to several root and crown rot diseases. It is more cold tolerant, and tolerant to early frost, than alfalfa. It grows to an approximate height of 3 feet, bearing raceme-arranged, pink flowers. The seed is large and usually processed with the hull intact, having approximately 28,000 seeds/lb (alfalfa has 220,000 seeds/lb).

It is easily established in the early spring in a well-prepared, firm, weed-free seedbed, planted 1/2 to 3/4 inch deep, at a full seeding rate of 26 pure-live-seed (PLS) lb/acre under dryland conditions, and 34 PLS lb/acre under irrigation. Immediately prior to planting the seed must be inoculated with a sainfoin-specific, nitrogen fixing bacteria (Type F). *Inoculants for alfalfa and other legumes will not work!* Sainfoin seedlings are vigorous, but do not compete well against weeds or cereal grains, and thus it should not to be planted at any time with a companion crop.

Sainfoin is best suited as a dryland pasture crop when established as a solid stand or in alternate rows with a productive forage grass. Under dryland conditions, it performs well with Russian wildrye and crested wheatgrass. In areas with short-season water and/or limited irrigation, it is compatible in alternate rows with intermediate/pubescent wheatgrass. Pubescent

wheatgrass can thrive in areas receiving 13 inches of natural precipitation, whereas intermediate wheatgrass would need additional overflow to be as productive on the same site. Both are very compatible with sainfoin. Yield of sainfoin in the first grazing rotation is greater than or comparable to alfalfa. Overgrazing, however, can be a problem because it is often selected over less desirable plants. It is very palatable and highly nutritious. Sainfoin is preferred over alfalfa by sheep and cattle, and is relished by deer and other wildlife. In the lingo of range managers, it is considered to be an "ice cream" plant.

Sainfoin greens up about the same time in the spring as alfalfa, but flowers 1 to 2 weeks earlier. It persists longer when allowed to reach  $\geq 70\%$  bloom stage prior to the first grazing event or in a case of a single cutting for hay. Allowing sainfoin to set seed prior to grazing promotes the establishment of new stand recruits and can extend its stand life. Sainfoin does not tolerate repeated defoliation and it is recommended that regrowth reach a minimum height of 8 inches and that the plants develop to the stage of bud or early-bloom.

It is generally recommended under irrigated conditions only in a pure stand as a short-term rotational crop. Sainfoin is intolerant of frequent irrigations, with lower yields and shorter longevity than alfalfa. It is reported to be an excellent feed additive when added ground or as silage. Seed production is very high under irrigation and, when planted in the appropriate environmental conditions, may exceed 1,000 pounds-per-acre. Higher seed yields and excellent quality honey is attainable when honey bees are used as pollinators.

Insects are not considered to be a problem in sainfoin in the U.S. Due to its immunity to the alfalfa weevil, the use of sainfoin is an alternative in those areas with high infestations of the weevil in alfalfa.

In addition to Eski and Remont, other improved U.S. and Canadian cultivars include 'Remont', 'Renumex', 'Melrose', and 'Nova'. The newest variety, 'Shoshone', was released by the University of Wyoming, and has improved tolerance to the Northern root-knot nematode. Certified seed of Shoshone is expected to be commercially available in August 2006.

Sainfoin is adapted to most of Montana and Wyoming. It performs best in Central Montana (east slope), and under irrigation in the Big Horn Basin and southeastern Wyoming.

*By Susan R. Winslow, PMC Agronomist.*

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