



# PLANT MATERIALS TODAY

A newsletter from the USDA-NRCS Montana-Wyoming Plant Materials Program for those Interested in Plants and Conservation



🌿 Volume 24 Number 1

September 2020 🌿



For more information on Plant Materials or for electronic access to this and other documents, access our web sites, [Montana NRCS](#) or [National Plant Materials Program](#). Direct inquiries to USDA-NRCS, Plant Materials Center, 98 South River Road, Bridger, MT 59014, phone: 406-662-3579, FAX: 855-510-7028. All photos by BPMC or Montana NRCS staff, or USDA or NRCS file photos, unless otherwise noted.

## 🌿 PMC and Staffing Updates 🌿

### ***New Employees***

It's been some time since our last newsletter but it's hardly the case that's because there hasn't been much to report. It's certainly been an unusual and exceptionally busy year at Bridger. Despite COVID-19 challenges the Center remained opened and staffed, and all the important tasks were accomplished. It was a good Foundation seed production year, an exceptional year for written technology transfer, and a productive year for studies and trials. We'll try to cover some of the high points in this issue.

Two important personnel changes at Bridger came in the form of a new PMC Board of Managers office administrator and a 2020 Big Sky Watershed Corps member. Theresa (Tess) Kosel was hired by the Board this spring and jumped right in coordinating various PMC construction projects and providing Board summer employee personnel and administrative oversight. Tess grew up on a ranch in Roberts, Montana, so she is well versed with agricultural operations. A graduate of Rocky Mountain College with a degree in psychology, she brings a professional and practical approach to all she does at Bridger. Welcome Tess!



Tess Kosel, Bridger PMC Board of Managers office administrator

Another valuable addition to our program this year has been Ryan Noack, the 2020 Big Sky Watershed Corps member. Ryan came aboard in January and will serve his term until November. Ryan was born and

raised in Minnesota and has a B.S. degree in agricultural business from Iowa State University. He recently started his M.S. degree in agricultural education through Montana State University. In 2019, Ryan moved to Montana and worked for the Montana Conservation Corps on a trails crew before coming to Bridger. Ryan has been involved with almost every facet of work at Bridger, from seed processing, planting, cultivating, mowing, and harvesting to database management, study plan development, installation, maintenance, and evaluation, and numerous publications. Like previous Big Sky Watershed Corps members, Ryan was integrated into operations very quickly, and has been an essential piece of our program this year. Welcome Ryan and thanks for the great service!



Ryan Noack, Big Sky Watershed Corps member at Bridger



Ryan Noack seeding replicated sorghum-sudangrass study

## Late Summer Seedings

From time to time, especially after a spring and summer with timely or exceptional precipitation, the Center takes calls on late summer seeding. Late growing season plantings are quite risky, and all the stars need to align before most are successful.

In general, timing of seeding in Montana and Wyoming reflects seasonal precipitation, the need to break seed dormancy, the growth requirements of the species (especially cool versus warm season plants), prevailing soil temperature and moisture, and operational limitations (field access, other farming operations, etc.). Seeding of cool season species typically occurs in late winter to early spring in hopes of capturing spring rains. Dormant seeds requiring a cold, moist chilling should be seeded as a dormant fall planting. Warm season crops require warmer soil temperatures for germination than cool season species and are typically planted in late May and June in environments like Bridger.



With above average spring and summer precipitation in 2019 and 2020 in many parts of eastern Montana, and resultant high soil moisture, we've had several inquiries about late summer seedings. In general, we do not recommend late summer seeding, particularly for dryland applications. In addition to the challenge of inconsistent soil moisture for the initial germination, low air temperatures can slow seedling growth and delay stand establishment, and pressure from late season annual weeds can stress seedlings.

It's important to mention that, under certain circumstances, mid- to late- summer seedings can establish well. At Bridger, under irrigation, we sometimes sow fields of grasses in mid- to late- August. We have been successful with this technique when growing fast establishing species (slender wheatgrass, thickspike wheatgrass, bromes), keep the fields moist, and having weed free fields at planting time. One advantage of late summer planting is that land managers have the spring and early summer prior to planting to control weeds and prepare fields for planting. Does it always work well? No. In some cases the weather is not conducive to rapid plant growth and the seedlings are too small going into winter and die. Weed and volunteer crop seeds in the soil seed bank can germinate and outcompete the planted crop. Delicate seedlings can succumb to early hard frosts and other unfavorable weather events.

If you are thinking about a late summer seeding, plan well ahead and make sure you have checked all the required boxes. Remember, proper species selection, supplemental irrigation, and a weed free planting bed are all essential. Call your local NRCS office, the Plant Materials Specialist, or the PMC with questions.

**Joe Scianna, Manager, Bridger PMC.**



## ***Recent Montana-Wyoming Plant Materials Publications and Training***

Even the best research and practical experience is of little value if it isn't shared with the audiences that need it. Getting technical information to NRCS field staff, partners, and landowners is an important function of every Plant Materials Center. This year the MTPMC completed and posted several publications and continued its webinar-based training program for NRCS field staff and partners.

The Bridger Plant Materials Center Year 2019 Progress Report of Activities was completed and is posted on the [Montana and Wyoming National PMC website](#). This comprehensive overview of 2019 activities and accomplishments is a useful summary for both NRCS staff and the public.

The [release brochure for 'Rosana' western wheatgrass](#) was revised and updated. This MTPMC release is widely used in many conservation practices where a rhizomatous native species is beneficial or needed. It's strong sod-forming characteristics makes it particularly effective for stabilizing soils and reducing soil surface erosion. It is broadly used as a reclamation species for improving depleted rangelands, minelands, roadsides, recreation areas, and construction sites. It makes excellent late-season forage for cattle, livestock, and elk, among other species.



Rosana western wheatgrass



Sunn hemp

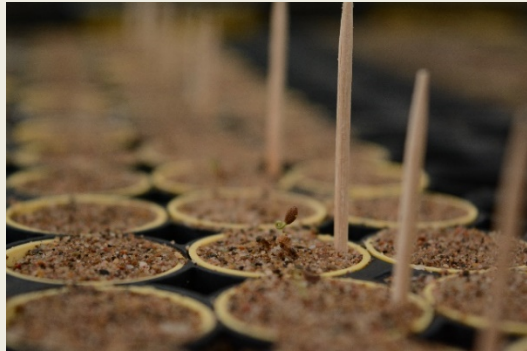
The final study report for the [Effect of Guar and Sunn Hemp Seeding Rate on Stand Count and Biomass Production in a Warm Season Cover Crop Mix – One Year Results](#) project is available. Cover crops are useful tools for enhancing soil health and providing other conservation benefits, but little information is available on individual species performance in multi-species mixes. In this study, two leguminous crops, guar and sunn hemp, were tested in a six-species mix at various seeding rates. For guar, there were plant density and aboveground biomass differences depending on seeding rate, but no differences for sunn hemp rates. Legume seeding rate had no effect on aboveground biomass production of the background mix for either species.

The final study report for the [Effects of Companion Cover Crops on One Year of Malt Barley Production](#) project is now available. This study investigated the effects of a three-species cover crop mix (crimson clover, forage collards, flax) sown with a conventional malt barley crop. Cover crops sown with or after cash crops may provide important conservation benefits. In one year of testing, the cover had no impact on the quantity or quality of the barley crop.



Malt barley - cover crop study

The [\*Cover Crop Seeding Date\*](#) final study report is also available. Although cover crops are often sown in the spring or early summer when soil temperatures reach about 60°F, it may be possible to sow them earlier allowing access to sub-irrigated sites and accomplishing planting before the busy growing season begins. In this study, seeding dates (March 30 and April 22) were not significantly different as they related to vigor, percent stand, stand count, or aboveground biomass, but there were differences among crops.



Seeding depth and media type study

The [\*Effects of Seeding Depth and Propagation Media on Seedling Emergence of Three Conservation Species\*](#) final study report by Zach Lenning (former Big Sky Watershed Corps member at Bridger and now Montana NRCS Soil Conservationist in Chinook) demonstrates the importance of seeding depth and media or soil type on seedling emergence, especially for small-seeded species. Three species (lacy phacelia, Sandberg bluegrass, western yarrow) were planted in two media types (sand, clay soil) and sown at four depths (0, 0.25, 0.5, 1 inch). Results of this

study demonstrate that seeding depth and media type effect seedling emergence differently by species.

The final study report for [\*Pheasants Forever Upland Gamebird Cover Crop Mixes for Salt-Affected Sites and Custom Warm Season Cover Crop Mixes for Salt-Affected Sites\*](#) demonstrations is now available. Although not replicated, these two trials provide insight into cover crop salinity tolerance and suggest what circumstances may or may not be appropriate for the use of the tested species and mixes. Overall, biomass production above 6 dS/m of conductivity (USDA soil salinity classification of “slightly saline”) was very low, suggesting salt-tolerant perennials may be a better fit for these conditions. For salty sites classified as “non-saline” or “very slightly saline” with less than 4 dS/m of electrical conductivity, the tested species may offer some conservation and production benefits.

The [\*Mixed- and Alternate-Row Seeding of Native Grasses and Forbs to Enhance Pollinator Habitat\*](#) study results suggest that alternate-row seeding is not needed to establish forb species in a pollinator planting. The species seeded performed similarly whether seeded in alternate rows or mixed rows, and in the presence or absence of a low percent (5%) of slender wheatgrass. More important to seeding success was the species selected. Species that established performed consistently well. Species that established well and had good performance in all treatments were Indian ricegrass, bluebunch wheatgrass, slender wheatgrass, sideoats grama, blanketflower, Lewis flax, prairie coneflower, and white prairie clover.



The [\*Evaluation of Cool Season Cover Crops in Southern Montana\*](#) study evaluated 58 commercially available cultivars and varieties of eight common annual, cool season species for their adaptation to

Montana and Wyoming. Austrian winter pea, balansa clover, black oats, cereal rye, crimson clover, daikon radish, hairy vetch, and red clover were evaluated for field emergence, plant height, days after planting to 50% bloom, disease and insect damage, and aboveground biomass production in 2017 and 2018. This study was part of the National Cover Crop Variety Adaptation Trial that tested the same species and cultivars at 25 Plant Materials Centers throughout the United States. This Technical Note summarizes research findings for each species and provides reference table summaries on each species' height, biomass, forage values, and nitrate levels.

In addition to the items discussed/linked above, these documents were produced in 2020 and are available on the [MTPMC website](#).

Plant Guides: [Desert Madwort \(\*Alyssum desertorum\*\)](#), [Hoary Alyssum \(\*Berteroa incana\*\)](#), and [Russian Olive \(\*Elaeagnus angustifolia\*\)](#)

Brochures: [Invasive Grasses in Montana](#) was developed with Montana State University to aid in the identification of invasive grass species. [How to Choose a Good Pollinator Seed Mix](#) is a colorful and informative guide for landowners interested in seeding pollinator plants.



Training webinars for NRCS field staff and partners continued in 2020, with good feedback from participants. Monica Pokorny (Plant Materials Specialist), Mark Henning (Miles City Area Resource Conservationist) and Joe Scianna (PMC manager) provided training on a variety of topics including *Plant Materials Selections for Rangelands*, *Cover Crop Selection for Montana and Wyoming*, *Interpreting a Seed Label and Seed Analysis Report*, and *Windbreaks: Plant Storage, Handling and Planting*. PowerPoints of these presentations can be found on the Montana and Wyoming NRCS Sharepoints for NRCS employees.

**Joe Scianna, Manager, Bridger PMC and Monica Pokorny, MT-WY Plant Materials Specialist, Bozeman, MT.**



## 🌻 Foundation Seed 🌻



Demand for Foundation seed was strong in 2020. Preliminary Foundation seed production numbers at Bridger for 2020 look good, with ample stocks of ‘Pryor’ slender wheatgrass, ‘Goshen’ prairie sandreed, ‘Critana’ thickspike wheatgrass, Stillwater Germplasm upright prairie coneflower, and Ekalaka Germplasm bur oak anticipated for 2021. Fair production of Great Northern Germplasm western yarrow, ‘Rimrock’ Indian ricegrass, Meriwether Germplasm blanketflower, ‘Trailhead’ basin

wildrye, ‘Garrison’ creeping foxtail, and ‘Shoshone’ manystem wildrye is also expected. It is important to note that moving forward, the Plant Materials program, and the MTPMC, will be allocating smaller amounts of Foundation seed to university Foundation seed and seed certification programs. With smaller PMC staff levels, the Plant Materials program is investigating and encouraging contracted production of our releases through the university system and other sources. Look for more details and information on this subject as the process develops.

It’s important to remember for conservation applications, a large majority of cost-efficient, readily available seed originates from the Plant Materials Program.

## 🌻 Field Plantings 🌻

Field plantings are a collaboration of Plant Materials staff with NRCS Field Offices to evaluate new plant species or planting technologies under a variety of soil, climatic, and land uses to assess their conservation potential under actual use conditions. In 2020, we evaluated 11 field plantings in Montana and Wyoming including three new seedings. Our milkweed planting near Hamilton, MT found that showy milkweed can establish from seed or rhizome transplants on sites with a high-water table or where soil around the roots remain moist (not wet) throughout the summer. In a smooth brome pasture diversification project near Stanford, MT, blanketflower was the best establishing native forb and sainfoin the best establishing introduced forb. In a similar smooth brome pasture diversification project near Cascade, MT, drill seeded small burnet, cicer milkvetch and/or forage chicory into glyphosate-treated pasture established and increased in density, canopy cover, and height over time. Sainfoin established on this site but decreased as the smooth brome recovered from the herbicide treatment.



Check out results of all MT and WY planting on the [field planting reports website](#). Reports provide useful information on lessons learned for incorporating into future conservation plantings.

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