



United States Department of Agriculture

## Bridger Plant Materials Center



### 2023 Progress Report of Activities

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The mission of the USDA Natural Resources Conservation Service (NRCS) Plant Materials Program is to assemble and test plant species for use in conservation programs to solve natural resource concerns. The Bridger Plant Materials Center (MTPMC), established in 1959, evaluates and selects plant materials and techniques for establishment and management of plants for use in resource conservation activities. There are 25 Plant Materials Centers (PMC) nationwide, each serving a specific geographic and ecological area. MTPMC provides plant solutions for conservation issues across the diverse ecosystems of Montana and Wyoming. This report presents an overview of 2023 activities at the MTPMC within the Montana-Wyoming Plant Materials Program and includes links to published technical documents.

#### Seed and Plant Production

In 2023, the MTPMC harvested, cleaned, and then shipped over 5,000 pounds of Pure Live Seed (PLS) of 15 Bridger Plant Materials Releases to commercial seed growers. Once increased by commercial growers, the seed will be used for conservation practices in Montana, Wyoming, and the northwest U.S. for post wildfire restoration, pollinator habitat enhancement, rangeland improvement, CRP renovation, and more. The MTPMC also shipped 100 sprigs of Spirit Germplasm sweetgrass and collected 82 pounds of Ekalaka Germplasm bur oak and 4 bushels of Hunter Germplasm ponderosa pine that was distributed to the [Montana State Conservation Seedling Nursery](#) for seedling establishment and purchase for conservation use.



Summer crew cleaning Meriwether Germplasm blanketflower seed with a clipper M2B.

#### Training

In 2023, we offered webinar trainings for over 600 NRCS field staff and partners through plant materials and brown bag webinars. These webinars are designed to deliver vegetative solutions and conservation technology to NRCS Field Offices and customers and ultimately improve conservation implementation. A variety of plant-related webinar topics were presented including *PMC Conservation Plant Selections*, *Successional Management for Rangeland Seedings*, and Extension Specialist Dr. Jane Mangold from Montana State University (MSU) provided an informative webinar on *Integrating Herbicides into Revegetation*. In the brown bag series, which incorporates plant materials information in NRCS programmatic applications, we presented *What CPS Seeding Practice to Use* and *How We Conduct Studies at the PMC*. MTPMC staff also presented live presentations on the *Plant Materials Program: Selecting and Testing Plant Species for Conservation Seedings* to approximately 300 participants throughout 2023. Recordings and PowerPoints of webinar presentations can be found on Montana and Wyoming NRCS SharePoint for NRCS employees and the [Montana NRCS Montana YouTube channel](#).

## **Outreach to NRCS Customers, Partners, and the Public**

In addition to training provided through webinars, Plant Materials program staff collaborated with NRCS staff, customers, partners, and the public to host field tours and demonstrations to MT and WY NRCS Field Offices. Our tours gave an overview of the Plant Materials program, Foundation Seed production and distribution, farming equipment, seeder calibration, and a cover crop study example. In spring 2023, MTPMC hosted a prescribed



*Monica Pokorny, Plant Materials Specialist, discussing foundation seed at the NRCS Bozeman Area Office Field Tour, 7/13/2023.*

burn training for NRCS staff. The training provided instruction on the practice of prescribed burning and pile burning in Montana and NRCS' role in prescribed burning, conducted a prescribed burn on grasslands, and practiced firebreak construction and pile burning.

At the request of the Montana Weed Control Association, we co-presented a workshop with MSU Extension at MWCA's annual conference on [Revegetation Guidelines, Considering Invasive and Noxious Weeds](#). This workshop closely followed our new publication outline while providing additional information and resources, and a case study from Missoula County Parks and Recreation Department.

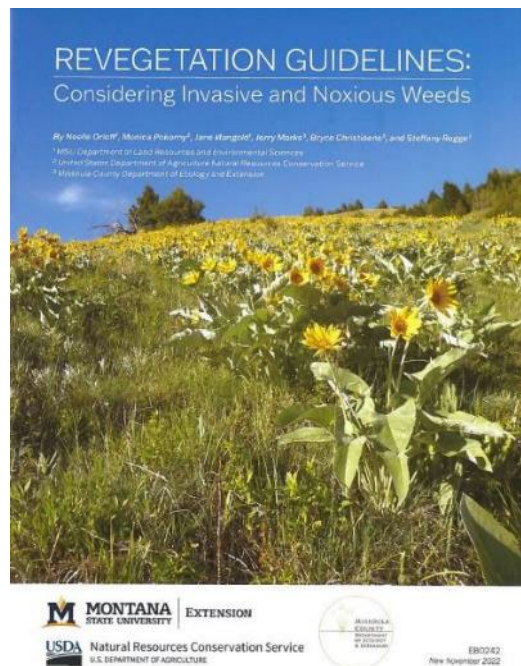
## **Products and Technology Transfer**

The Plant Materials Program developed or updated five new technical documents for NRCS staff and partner use in conservation programs to solve natural resource concerns. In addition, seven documents were updated including six release brochures and a Plant Guide. A big 'thank you' to all reviewers for providing valuable feedback and suggestions!

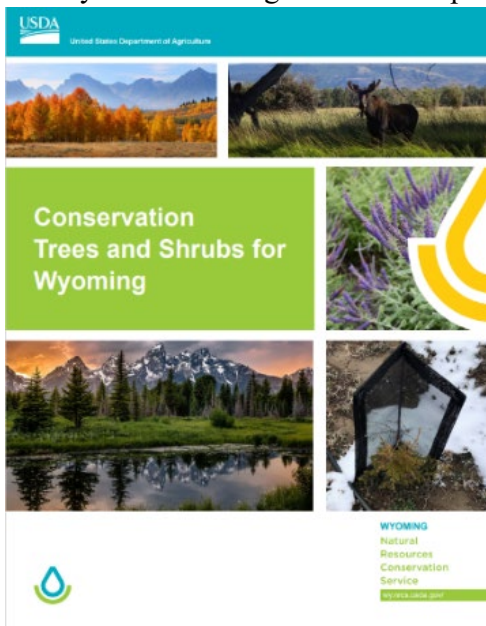


*MTPMC hosted a burn training, and a prescribed burn of 'Goshen' prairie sandreed, 4/26/2023.*

We're pleased to announce a new joint publication from NRCS, MSU, and Missoula County titled [\*Revegetation Guidelines: Considering Invasive and Noxious Weeds\*](#). This 44-page booklet provides a practical, step-by-step guide to establishing desired plants in Montana through revegetation, specifically in the context of integrated weed management. We outlined seven steps to plan and execute a revegetation project. Users should reference the steps and additional resources noted throughout the publication for optimum success. Throughout the revegetation process, keep in mind that we are addressing the process from a vegetative perspective – the plants' ability to establish, survive, and provide an intended benefit (e.g., weed management, conservation, or forage production). Our goal is that the seeded plants thrive; otherwise, it is unlikely they will compete with re-invading weeds and help meet land management objectives. If you'd like a hard copy of the booklet, please email [ug-MT-nrcs-publications@usda.gov](mailto:ug-MT-nrcs-publications@usda.gov) and specify the number you'd like sent to your office.



Do you need help planning a seeding project for a salt-affected site? Check out the revised and updated Plant Materials Technical Note MT-26 (rev2) [\*Plants for Saline and Sodic Soil Conditions in Montana and Wyoming\*](#). This Tech Note provides background information on saline and sodic soil formation, salinity and sodicity measurements, soil characteristics, effects on plants, and management of salinity problems. Over twenty years of regional plant materials research is incorporated in this publication to assist you in matching salt tolerant species to site salinity conditions. Seeding rates for salt-tolerant



grass, forb, legume, and shrub species used in Montana and Wyoming conservation plantings are included. Tables also provide information on species relative salt tolerance rating, electrical conductivity (EC) level at which plant production yields become affected (i.e., reduced yield), and an upper salinity (EC) limit above which plants will usually not germinate. Follow the seeding and planting guidance to improve your seeding success.

The popular *Conservation Trees and Shrubs* booklets for Wyoming and Montana have been revised in 2022 and 2023. The publications focus on identifying and describing trees and shrubs capable of tolerating Montana and Wyoming's severe climatic and environmental conditions, the site conditions where they are best adapted to grow, and some of the benefits each tree and shrub provides. Electronic copies can be downloaded from the [MTPMC website](#). Contact your state NRCS office for hard copies.

MTPMC finalized two study reports and incorporated the results into MT and WY NRCS Conservation Planning information. The objectives of the first study [\*Sorghum-Sudangrass Varietal Production\*](#) were to evaluate plant density (plants per linear foot), plant height (cm), and aboveground biomass (lb/acre) of four sorghum-sudangrass varieties in a dryland setting in 2020 and 2021. Sorghum-sudangrass aboveground biomass production was greater in 2020 than in 2021 likely due to twice the amount of

precipitation falling in 2020 than in 2021. Although there were differences in varietal density in both years and height differences in 2020, there were no differences in biomass production in each year. All the varieties tested proved to be suitable for cover crop use in similar climates in Montana or Wyoming when rotational grazing, hay, cover, or silage are preferred.

A companion study is the [Sorghum-Sudangrass Varietal Performance in a Cover Crop Mix](#) which compared the same four sorghum-sudangrass varieties in a seven-species cover crop mix without irrigation in 2020 and 2021. Sorghum-sudangrass and cover crop mix plant emergence and biomass production were greater in 2020 compared to 2021, likely due to twice the amount of precipitation in 2020 than 2021. Even though sorghum-sudangrass varietal emergence differed in 2020 and 2021, biomass production was statistically the same each year. Comparing this study to the companion sorghum-sudangrass monoculture study, the highest varietal plant densities were not consistent between studies, which could be affected by the cover crop mix used in this study, or initial varietal response to precipitation, or other environmental factors. Cover crop mix plant emergence varied in 2020 but was not significantly different in 2021. There were no significant differences in cover crop biomass production between cover crop mixes in either 2020 or 2021. The sorghum-sudangrass varieties analyzed are appropriate to integrate into cover crop mixes in similar climates in Montana or Wyoming.



*Harvesting the Sorghum-sudangrass varietal study, Sept 2021.*



*Meriwether Germplasm blanketflower displaying flower power and attracting pollinators.*

[Blanketflower Plant Guide](#) was updated to include new information related to its distribution, habitat, and ethnobotany. Blanketflower is used to increase species diversity in native plant seed mixes for disturbed site rehabilitation. Its drought tolerance makes it a good candidate for waterwise gardens and low watering zones. Blanketflower can be used as vegetative cover and a food source for pollinators, wildlife, and livestock. It has a high pollinator visitation rate and attracts bee species, supports specialist bee species, and blooms for extended periods across its range. Blanketflower is used by many indigenous people for food and medicine.

One of the six revised release brochures is [Spirit Germplasm Sweetgrass](#) which is a native cool-season grass. It is a culturally significant plant in Native American religious and spiritual purifying ceremonies. Leaves are woven when green into long braids. It is then dried and burnt as incense smudge or used to perfume clothing and other personal items. Wildlife, such as rodents and small mammals, browse on sweetgrass. Sweetgrass can spread quickly, and the dense,



*Spikelet of Spirit Germplasm Sweetgrass. This species emits a sweet vanilla fragrance.*

below-ground biomass may stabilize disturbed soil during restoration of riparian and wetland ecosystems.



*Old Works Germplasm Fuzzytongue Penstemon in bloom.*

Another updated release brochure is [Old Works Germplasm Fuzzytongue Penstemon](#) which is a native perennial forb that naturally occurs near Anaconda, Montana. It performs well in moderately acidic and heavy-metal contaminated soils common at hardrock mine lands. Old Works Germplasm’s adaptation to dry, open terrain makes it a valuable addition to shrub and rangeland restoration plantings. This attractive wildflower is also suitable for use in pollinator plantings, Xeriscaping, and rock gardens. This species is considered an important food source for many classes of wildlife and birds which utilize both herbage and seeds.

[Prospector Germplasm Common Snowberry](#) also naturally grows near Anaconda, Montana and has many conservation uses. It can be used to revegetate moderately acidic and heavy metal laden mine land sites. With a densely branched and shallow root system, in combination with short spreading rhizomes, Prospector Germplasm can effectively stabilize soil and reduce soil erosion on upland slopes and in riparian areas. It is utilized for nesting, cover, and food by many birds, ungulates, and small mammals in the western United States. It contains a higher percentage of crude protein in the fall and winter compared to grasses and forbs, but lower concentrations in the spring and summer. Prospector Germplasm is considered fair to good forage for sheep and goats, and important wildlife browse in the winter.



*Prospector Germplasm snowberry originated in Deer Lodge County, MT.*

See additional 2023 updated Release Brochures:

- [Washoe Germplasm Basin Wildrye](#)
- [Stillwater Germplasm Prairie Coneflower](#)
- [Antelope Germplasm Slender White Prairieclover](#)

## Research Activities

The second year of two dryland replicated studies was completed in 2023. The first study tested the effect of three different seeding rates and two different seeding times of sixweeks fescue to suppress cheatgrass in a rangeland setting. Cheatgrass was not suppressed by sixweeks fescue seeding rates or seeding dates in both years. A final study report will be available in early 2024.

The second study assessed the effects of cover crop seeding rate and two different forage brassicas on stand establishment and yield for weed suppression and forage quantity and quality. This study aimed to determine if Bayou kale outperformed Impact forage collard in a cover crop mix as well as evaluating seeding rates and yield. A final study report will be available in early 2024.



*MTPMC Agronomist Michelle Majeski and Biological Science Technician Jesse Kersh collect forage samples from the brassica plots.*



*Stillwater Germplasm prairie coneflower blooming in the pollinator mix trial.*

A one-season trial was conducted using four Bridger PMC releases as a pollinator mix to suppress weeds along field edges at four sites at the PMC. The mix included [Meriwether Germplasm blanketflower](#), [Stillwater Germplasm prairie coneflower](#), [Antelope Germplasm white prairie clover](#), and [‘Rosana’ western wheatgrass](#). Pollinator mix cover varied among the sites from 5 to 50%. A second year of data will be collected in 2024 to assess mix establishment and weed suppression.

### **Bridger PMC Staff**

Manager: [Charles Eckman](#)

Plant Materials Specialist: [Monica Pokorny](#)

Biological Science Technician: Jessica Kersh

Agronomist/Study Leader: [Michelle Majeski](#)

Farm Foreman: [Darren Zentner](#)

AmeriCorps Member: Isabella Ayala

We would like to introduce Charles Eckman, the new Plant Materials Center Manager. Just like the growing seasons, it has been a year of change at the Bridger Plant Materials Center. Joe Scianna retired December of 2021. Thanks to Joe for the dedication and expertise provided to the Plant Materials Program for over 30 years.

#### *A message from Charles:*

I started as the new Manager at the Bridger Plant Material center in June 2023. I was born and raised in Duluth, Minnesota. I then studied Horticulture at Montana State. This is when I first learned of the Bridger PMC. A few decades later, I found myself starting a new position at the Bridger PMC. Previously I served numerous roles with multiple agencies (NPS, USFS, USACE) ranging from a biological science technician to horticulturist and natural resource specialist. I have been fortunate to support conservation efforts in Minnesota, Montana, Idaho, Michigan, and California. My time in the field has exposed me to a variety of ecosystems and the many natural resource challenges that exist. These challenges are comparable to seed physiology for breaking dormancy. Cracking the dormancy code varies from species, new methods may need to be established, but overall methods and natural resource challenges share more similarities than differences. I would like to learn more about natural resource concerns that are posing challenges in your areas so we can find vegetative solutions for these concerns. In my short time at the PMC, I have met many hardworking and passionate employees and look forward to meeting everyone.



*Charles Eckman, new PMC Manager, discussing Bridger-Select Germplasm Rocky Mountain juniper at a field tour, July 2023.*

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