



United States Department of Agriculture

NRCS Bridger Plant Materials Center

2019 Progress Report of Activities

Issued January 2020

The Bridger Plant Materials Center (MTPMC) strives to provide technical information and other products supporting Service Center staff and their clients, with an emphasis on supporting Customer Service for NRCS and USDA. This report presents a brief overview of 2019 activities at the MTPMC and within the Montana- Wyoming Plant Materials program and includes links to issued Technical Documents on the MTPMC [website](#).

The NRCS - Montana-Wyoming Plant Materials Center (MTPMC) is one of 25 Centers nationwide using plants to solve natural resource problems. Our current program emphasis addresses rangeland health, cover crops and soil health, pollinator-friendly plantings, woody plant establishment, and technology transfer, training and outreach. Our work reflects the current needs identified by our field staff. Our primary products include the development of new conservation technologies, conservation staff training, plant testing and selection, and Foundation seed production.



Studies

Seed Depth: Three replicated studies were planted at the MTPMC in 2019. Zachary Lenning, Big Sky Watershed Corps member, led two studies. The first was a greenhouse study titled *Effects of Seeding Depth and Propagation Media on Seedling Emergence of Three Conservation Species*. This study investigated the total number of seedlings emerging and the time required for emergence of three species (lacy phacelia, Sandberg bluegrass, and western yarrow) when seeded at four depths (surface, 0.25-, 0.5-, 1-inch deep) in sand and a clay-loam soil. Results varied significantly by species.



For lacy phacelia, there were significant differences in total seedlings emerged and average days to emergence. Surface planting seeds resulted in significantly fewer total seedlings, although days to emergence was faster than at most other seeding depths. Additionally, total seedlings emerged was greater in sand than clay loam soil whereas days to emergence was less with sand.

There were also significant differences in seedlings emerged and days to emergence for Sandberg bluegrass. Significantly less seedlings emerged requiring greater days to emergence when Sandberg was seeded at 1 inch. Propagation media did not affect either evaluation parameter for Sandberg bluegrass. For western yarrow there were significant differences in seedlings emerged and time to emergence with seeding depth, as well as differences in emergence with propagation media.

This final study report will be available on the Plant Materials and Montana NRCS websites in January 2020.



In the second study titled *Effect of Seeding Depth and Mix Compatibility on the Establishment and Production of Lacy Phacelia*, lacy phacelia and Austrian winter pea were planted in the field at 0.5- and 1.0-inch deep, in single species stands and mixed together. The purpose of this study was to determine if planting depth and seeding lacy phacelia with Austrian winter pea effects biomass production and stand count, and if so, to what degree. There were no significant differences in biomass production or stand count for either species with planting depth. There were differences in biomass production of both species when planted alone versus in a mix. Stand count was not impacted by seeding as a single species versus in a mix for

either species. Complete results will be posted in early 2020 on the MTPMC Plant Materials websites

Cover Crop: Another 2019 project was titled, *Impact of Warm Season Legume Seed Rate in Cover Crop Mix Legume Presence and Production*. This study was designed and led by NRCS Area Agronomist Mark Henning. The goal was to investigate stand establishment and above-ground biomass production of guar and sunn hemp in a cover crop mix with varying seeding rates (2.5, 5, 10 lb./A). There was a significant difference in stand count for guar at the 19 lb/ac rate but no differences for stand among seeding rates for sunn hemp. For biomass production, there was significant greater production of guar at the 10 lb/ac seeding rate than the other rates, but no difference among sunn hemp seeding rates. Guar and sunn hemp seeding rate impacted total cover crop above-ground biomass production.



In 2019, MTPMC staff with several collaborators summarized several completed studies. The [January Frost Seeding of Cover Crops Study](#) was a preliminary demonstration planting investigating the performance of 12 different single-species and eight different mixes when seeded in January in Bridger, MT. Although vigor rating of all species and mixes was high, percent stand varied widely among species. Cereal crops performed the best, both as single-species and in mixes.

[Comparing Establishment and Growth of Five Native Grass Species Collected in Yellowstone National Park to Those Selected by the Plant Materials Program](#) determined if seed source might be a factor in establishment failures at a site dominated by non-native species, including the highly competitive desert madwort. Test plots were on the northern boundary of Yellowstone National Park, and at MTPMC. Study results indicate that establishment failures at the Yellowstone site were not likely the result of seed source issues, but that seed source can be a factor in restoration success.



Training

To better deliver conservation training over the large MTPMC service area, Plant Materials staff instituted a webinar-based training series for NRCS conservation staff in 2019. The first webinar, *Creating and Enhancing Pollinator-Friendly Plantings* covered the importance of pollinators to conservation, factors for site selection, how to avoid impacts from pesticides, and the benefits of using a variety of pollinator-friendly plant species. The next two webinars addressed *Plant Materials for Salt-Affected Sites*, including an overview of soil and water management, and species useful in revegetating salt-impacted sites. *Revegetation in Forestry Practices Considering Invasive Plant Management* discussed a framework for deciding when revegetation is needed in forestry practices when invasive plants are present, and examples of seeding in wildfire and harvest projects. All webinars and supporting documents are saved on the MT and WY Sharepoints.



Outreach to NRCS Customers, Partners, and the Public

In addition to the direct NRCS training through webinars and Conservation Planner training, MTPMC reached out to our customers, partners and the public through presentations at: Montana Native Plant Society, Montana Society of American Foresters, Association of State Geologists, Montana State University Extension training events, Montana Audubon Center, Billings Pollinator Week event, and Conservation District events.

Field Plantings

Field plantings are a collaboration of PM 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 2019, we evaluated 11 field plantings in Montana and Wyoming including two newly seeded plantings.



This spring, the Teller Wildlife Refuge, Pheasants Forever, NRCS Hamilton Field Office, MSU Ag Experimental Station, and NRCS Plant Materials worked together to seed a milkweed and pollinator field planting near Hamilton, MT. This field planting tests planting milkweed seed alone, milkweed rhizomes alone, and a milkweed-pollinator seed mix (penstemon, hairy goldenaster, blanketflower, blue flax, milkweed, green needlegrass, and bluebunch and western wheatgrasses) to see how well the species establish. The milkweed rhizome planting builds off research at the Idaho

Plant Materials Center. In addition, the Teller Wildlife Refuge is working with the Hamilton FO to install larger scale pollinator and monarch plantings through the NRCS Honey Bee Pollinator Special Initiative.

Another new field planting tested improving a smooth-brome dominated pasture by adding legumes and other palatable forb species. Cicer milkvetch, sainfoin, and small burnet provide high quality forage for livestock and wildlife. Forage chicory is not commonly planted in Montana but was tested because it is highly palatable and similar in nutritional and mineral content to alfalfa and cool-season grasses. During the first growing season, all species established but no flower stalks were forming. Forage chicory, sainfoin, and small burnet had over 1.25 plants/ft² but were seedlings with a low canopy cover this first season.

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.

Technical Documents

In addition to the items discussed/linked above, these documents were produced in 2019 and are available on the [MTPMC website](#). They are intended to provide technical information and support to our Area, Field Office, and Service Center staff.

Technical Notes: [Plant Species Suited for Revegetation by Ecological Site in Wyoming](#)
[Biological Control of Invasive Plants in Montana](#)

Study Reports: [Container Depth as it Influences Plains Cottonwood and Bur Oak Seedling Survival and Growth](#)

Release Brochures: [Critana thickspike wheatgrass *Elymus lanceolatus*](#)



Foundation Seed

A majority of cost-efficient, readily available conservation seed originates from the Plant Materials program. Demand for MTPMC Foundation seed by commercial seed producers for certified seed production remains high. In 2019, the MTPMC maintained 44 active Foundation and Breeder seed production fields or orchards.

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