



United States Department of Agriculture

Conservation Plant Selections



from the
**Montana-Wyoming
Plant Materials Center**

**Serving the Northern Great Plains and
Intermountain West Regions**

*A collection of releases with
conservation applications, attributes,
limitations, and more*

**Natural
Resources
Conservation
Service**

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Table of Contents

- Introduction4
- Conservation Application Descriptions 6
- Conservation Applications Table 7
- Map 8
- Grasses 9
- Legumes & Forbs 23
- Shrubs & Trees 31

Introduction

How to Use this Booklet

When considering plant species for conservation uses, it can be challenging to find the information you need to start your project. *Conservation Plant Selections from the Montana-Wyoming Plant Materials Center* is a guidebook describing conservation plant selections from the Montana-Wyoming Plant Materials Center (MTPMC), designed to help you decide which tested releases are best suited to your project. The MTPMC does not sell any seeds or plants but provides the first generation of seed to the Montana State University Foundation Seed Service and the University of Wyoming Seed Certification Program for distribution to commercial seed producers and nurseries, who in turn produce seed and plants for purchase by the public.

This booklet describes plant releases from the MTPMC. Each release entry contains basic information on how to use these plants, where to use them, and what to expect if you do use them. The information provided includes an approximate number of seeds per pound, recommended conservation applications, positive attributes and potential limitations, a brief origin of the selection, the meaning of the release name, as well as pictures of our releases at work.

In this booklet you will find a map illustrating the regions and key locations described in the release information as they relate to original collection sites and anticipated ranges of adaptation. Another section defines each conservation application and the corresponding “conservation emblem” associated with each use. This section includes a table summarizing the releases with their respected conservation

applications so you can quickly find plants that will work best for your project. The section describing each plant release constitutes the majority of this booklet. It is ordered by the plant’s common name, and grouped by grasses, legumes and forbs, and shrubs and trees.

Montana-Wyoming Plant Materials Center

Located in Bridger, Montana, the MTPMC is one of 25 Plant Materials Centers in the USDA-Natural Resources Conservation Service (NRCS), Plant Materials Program. These centers collect, test, and release conservation plant selections and develop innovative technologies for their production and establishment. Our main customers are agricultural land producers and NRCS staff, as well as other private and public land managers. The overall objective of the MTPMC is to select well adapted plant materials and develop improved conservation practice technologies for enhanced natural resource protection in Montana and Wyoming. The MTPMC service area ranges from the mountains in western Montana and Wyoming, to rolling plains, desert basins, and plateaus in the remaining parts of the two states. The 130-acre MTPMC farm was converted from a homestead to a Soil Conservation Service (now NRCS) operation in 1959 and has been working to support conservation efforts in the region ever since. The MTPMC uses improved selections and innovative technologies to achieve specific objectives, including improved rangelands, enriched soil health, enhanced pollinator habitat, increased tree and shrub establishment, diversified native plant communities, and restored critical areas.



Release Classification

Early in the Plant Materials Program, selections went through a lengthy testing process leading to a ‘cultivar’ level of release (noted by two apostrophes), often requiring 10 to 20 years of research. The process required long-term testing of the proposed selection against other collections to determine if there was a statistically significant improvement over other seed sources. Over time it was determined that for conservation applications, a faster and more flexible selection process was needed, and the Plant Materials Program transitioned to include pre-varietal testing. Depending on the amount of testing conducted, various levels of selection or “Germplasm” (the term germplasm in this context denotes the selection is not a ‘cultivar’) were released. The highest level of testing is the Tested-Class, followed by the Selected-Class, and the Source-Identified Class. Additional testing over time can result in a selection being upgraded to the next release class, even ultimately, the ‘cultivar’ level. The majority of the pre-varietal releases from the MTPMC are Selected-Class releases, indicating plants that are selected from promising parent plants without extensive testing over multiple years or generations. Tested-Class is similar to Selected-Class but has received more testing across multiple generations, often including testing of the parent plant. Source-Identified releases have little or no testing and can simply be a local stand of a species growing well on a harsh site or demonstrating some favorable conservation attribute. Cultivated stands of Source-Identified releases may or may not be maintained at a PMC. Tested seed sources

are recommended over untested sources (“Variety-Not-Notated” or “VNS”) because tested seed has proven success in certain environments and for specific conservation purposes.

To ensure you get high quality seed for your project, purchase certified seed from reputable vendors. Certified seed is verified by a third party to make sure the proper standards are met. There may also be requirements in your state NRCS programs to use certified seed for conservation plantings. To find a plant and seed vendor in your area, see Technical Note 33: “Plant and Seed Vendors for ID, MT, NV, OR, UT, WA, and WY” under the publications section on the MTPMC Homepage.

Publications from the MTPMC

This booklet provides basic information about our releases to help begin planning your project. For more in-depth information, visit the following websites for technical resources regarding planting methods, seed and plant vendors, designing seed mixes, and more.

- MTPMC Homepage (Technical Notes, Plant Guides, Release Brochures): www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/west/mtpmc
- PLANTS Database (Plant Species Information): plants.sc.egov.usda.gov
- NRCS website (Technical Resources, State Contacts, Program Information): www.nrcs.usda.gov



Conservation Applications

Potential conservation applications for releases from the Montana-Wyoming Plant Materials Center used in the Great Plains and Intermountain West regions are listed and described by an emblem below. To find plants useful for a particular application, see the table on page 6. All releases in this booklet can be used for rangeland, forestland or grassland restoration projects, revegetation of disturbed sites, and native landscape improvement as well as their marked conservation applications.



Erosion Control

Definition – A plant with a strong root system planted in an area where the soil is unstable due to its natural texture, strong winds, or water runoff.



Forage Production

Definition – A plant that is grazed by livestock, offering good animal nutrition, and is at least moderately tolerant to trampling or overgrazing.



Mine Land Reclamation

Definition – A plant that survives well on soils damaged by smelter fallout or previously mined land and is used to improve the landscape and ecosystem. These damaged soils may be highly acidic and/or contain high concentrations of heavy metals.



Pollinator Habitat Enhancement

Definition – A plant that is useful to pollinating insects because it offers pollen, nectar, or nesting habitat. These plants should always be used in a mix with other plants beneficial to pollinators in order to create diversity, an important factor in creating a healthy pollinator habitat.



Riparian Buffer

Definition – A plant used in riparian areas to help create a healthy ecosystem, particularly to benefit the watershed. A riparian zone is generally considered the land area containing a waterbody, such as a river, lake or other wetland, and including the floodplain.



Salt-Affected Sites

Definition – Plants utilized on soils with the goal of reducing concentrated salt deposits. Salts in soil and water can reduce land productivity and limit uses. The releases from the MTPMC selected for salt-affected sites typically grow well on USDA soil salinity classifications *very slightly saline* to *moderately saline*, but some can tolerate even *strongly saline* soils. Although these plants will not thrive on salt-affected sites as well as they would on non-saline soils, they establish and improve productivity and increase conservation benefits.



Wildlife Habitat Enhancement

Definition – A plant that offers food, cover and/or nesting to native wildlife species, including hooved game species, upland gamebirds, songbirds, and rodents. These plant species are particularly important for helping wildlife survive the harsh winters of the northern US regions.



Windbreak/ Shelterbelt

Definition – Trees and shrubs are used to create a barrier from heavy winds or blowing snow to protect homesteads and livestock, reduce damage to other plants and prevent soil erosion. These plantings are typically one to several rows of trees and/or shrubs planted along the edge of a field.

Type of Plant

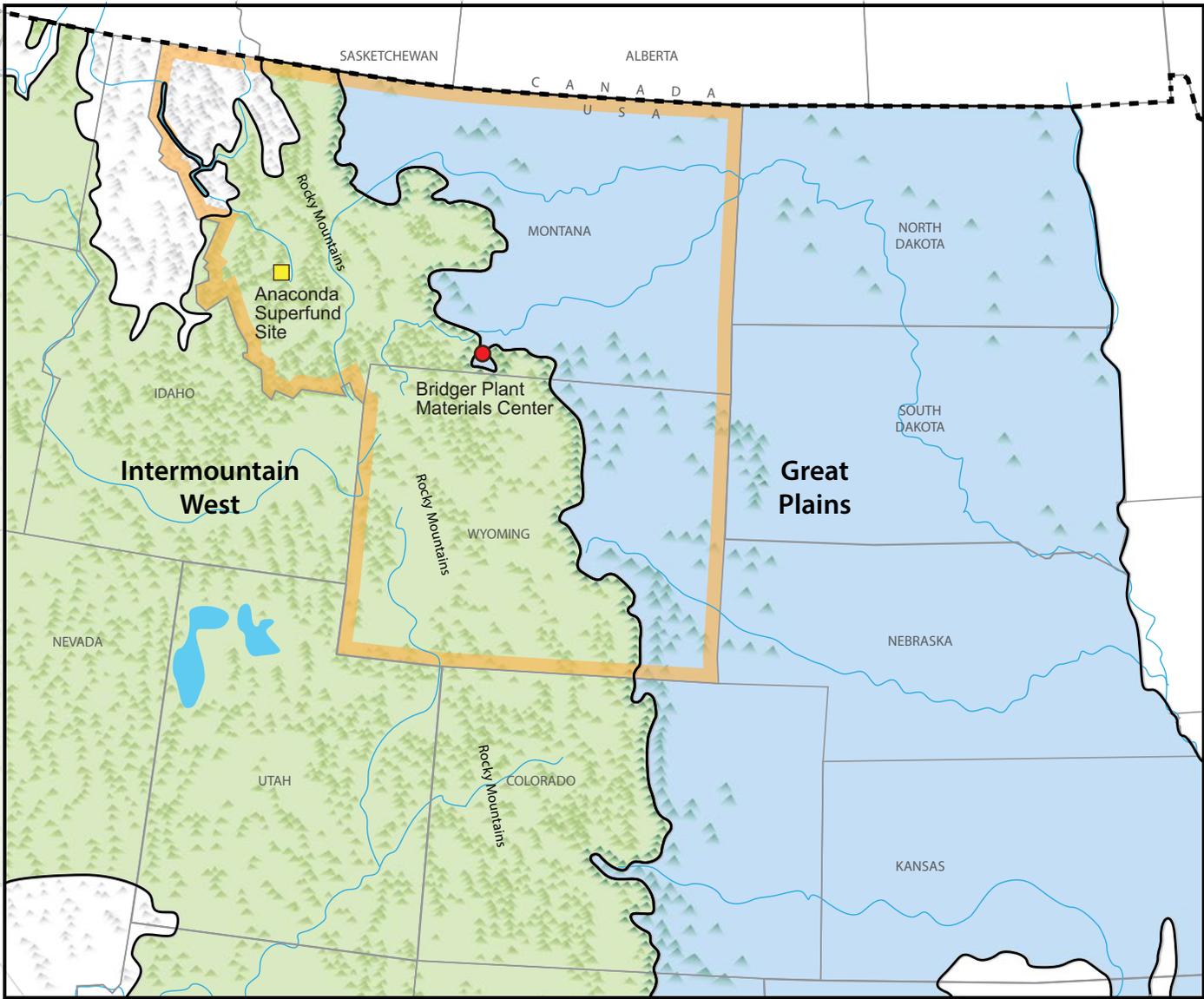
Grasses									
Release Name	Common Name	Erosion Control	Forage Production	Mine Land Reclamation	Pollinator Habitat Enhancement	Riparian Buffer	Salt-Affected Sites	Wildlife Habitat Enhancement	Windbreak/Shelterbelt
Opportunity* (pg. 10)	bluegrass, Nevada	X	X	X	X			X	
High Plains* (pg. 11)	bluegrass, Sandberg		X	X	X			X	
Garrison (pg. 12)	creeping foxtail	X	X				X		
Rimrock (pg. 13)	Indian ricegrass	X	X	X	X			X	
Goshen (pg. 14)	prairie sandreed	X		X				X	
Spirit* (pg. 15)	sweetgrass	X				X			
Pryor (pg. 16)	wheatgrass, slender		X	X	X	X	X	X	
Copperhead* (pg. 17)	wheatgrass, slender	X	X	X	X	X	X	X	
Critana (pg. 18)	wheatgrass, thickspike	X	X	X		X			
Rosana (pg. 19)	wheatgrass, western	X	X	X		X	X		
Trailhead (pg. 20)	wildrye, basin	X	X	X	X	X		X	
Washoe* (pg. 21)	wildrye, basin	X	X	X	X	X		X	
Shoshone (pg. 22)	wildrye, manystem	X	X			X	X	X	

Legumes & Forbs									
Release Name	Common Name	Erosion Control	Forage Production	Mine Land Reclamation	Pollinator Habitat Enhancement	Riparian Buffer	Salt-Affected Sites	Wildlife Habitat Enhancement	Windbreak/Shelterbelt
Meriwether* (pg. 24)	blanketflower		X	X	X			X	
Lutana (pg. 25)	cicer milkvetch	X	X		X				
Old Works* (pg. 26)	fuzzytongue penstemon			X	X				
Stucky Ridge* (pg. 27)	silverleaf phacelia			X	X				
Stillwater* (pg. 28)	upright prairie coneflower	X		X	X			X	
Antelope* (pg. 29)	white prairie clover		X		X			X	
Great Northern* (pg.30)	yarrow, western	X			X			X	

Shrubs & Trees									
Release Name	Common Name	Erosion Control	Forage Production	Mine Land Reclamation	Pollinator Habitat Enhancement	Riparian Buffer	Salt-Affected Sites	Wildlife Habitat Enhancement	Windbreak/Shelterbelt
Ekalaka* (pg. 32)	bur oak	X				X		X	X
Wytana (pg. 33)	moundscale	X	X	X			X	X	
Hunter* (pg. 34)	ponderosa pine	X				X		X	X
Bridger-Select* (pg. 35)	Rocky Mountain juniper	X				X		X	X
Mill Creek* (pg. 36)	silver buffaloberry	X		X	X	X	X	X	X
Dupuyer/Pondera* (pg. 37)	silverberry	X				X	X	X	X
Prospectors* (pg. 38)	snowberry, common	X	X	X		X		X	X
Trapper* (pg. 39)	snowberry, western	X	X	X		X		X	X

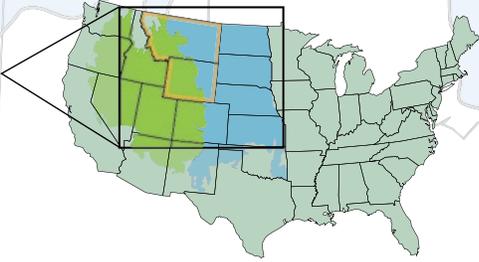
Notes: *denotes germplasm

Montana-Wyoming Plant Materials Center Service Area



- LEGEND**
- Service Area
 - Intermountain West Region
 - Great Plains Region

Enlarged Map



Grasses



Opportunity Germplasm Sandberg (Nevada) bluegrass

Poa secunda J. Presl.



1,029,000 seeds per pound

Release Name Meaning:

The original collection site was near the Opportunity Sediment Ponds, a waste site for the Anaconda Smelter Superfund Site.

Conservation Applications:



Selection Attributes: Opportunity Germplasm is a Selected-Class native, long-lived, cool season perennial bunchgrass. The root system is fibrous, deep, and extensive. It is tolerant of extreme cold temperatures and drought

conditions. This release was selected for superior seedling emergence and vigor, total plant biomass and cover, and overall survival on lime-amended, acid, and heavy-metal impacted sites. It establishes easily and quickly on sites with low soil pH and high levels of heavy-metal contamination. Opportunity Germplasm is also used for reseeding rangelands and forests because it suppresses weed growth. It provides good forage for livestock and wildlife species, and cover for upland birds.

Limitations: Nevada bluegrass is easily overgrazed so it should be managed closely until fully established, often after two growing seasons.

Origin: Seed was collected near Anaconda, Deer Lodge County, Montana in 1998. The site was severely contaminated with heavy metals from smelter fallout, surface wind and water transport, and

overflow from a waste canal supplying the Opportunity Sediment Ponds. The site was highly acidic with a surface soil pH of 4.3. This site averages 14 inches of annual precipitation at 5,000 feet elevation.

Range: Nevada bluegrass is found throughout western North America, predominantly in the Intermountain West region on well-drained soils, mostly in valleys and foothills.

Growing Conditions: Opportunity Germplasm grows best in areas receiving 10 to 14 inches of annual precipitation at 2,000 to 6,000 feet elevation, surviving best at lower elevations in that range.

Soil Types: Opportunity Germplasm is adapted to light- to medium-textured, moist soils. It grows on acidic, heavy-metal contaminated soils, and excessively well drained sites.

High Plains Germplasm Sandberg bluegrass

Poa secunda J. Presl.



925,000 seeds per pound

Release Name Meaning:

The original seed collections were made from relatively high elevations in the Great Plains region.

Conservation Applications:



Selection Attributes: High Plains Germplasm is a Selected-Class native, cool season perennial bunchgrass. The root system is fibrous, deep, and extensive. It is tolerant to drought and trampling because of its root system. It is one of the first species to begin new

growth in the spring and is typically a pioneer species when planted on disturbed sites. It is highly palatable to livestock early in the growing season and has fall regrowth on sites with adequate moisture. Wildlife use the forage and seeds throughout the growing season.

Limitations: High Plains Germplasm is susceptible to stem and leaf rot which can result in decreased seed production. It survives trampling and grazing so it can overtake an area where grazing is not managed.

Origin: Seed was collected from three rangeland sites between 1980 and 1983 in Natrona, Uinta, and Campbell Counties, Wyoming. These three sites receive between 7 and 14 inches of annual precipitation and are at elevations ranging from 4,500 to 6,300 feet.

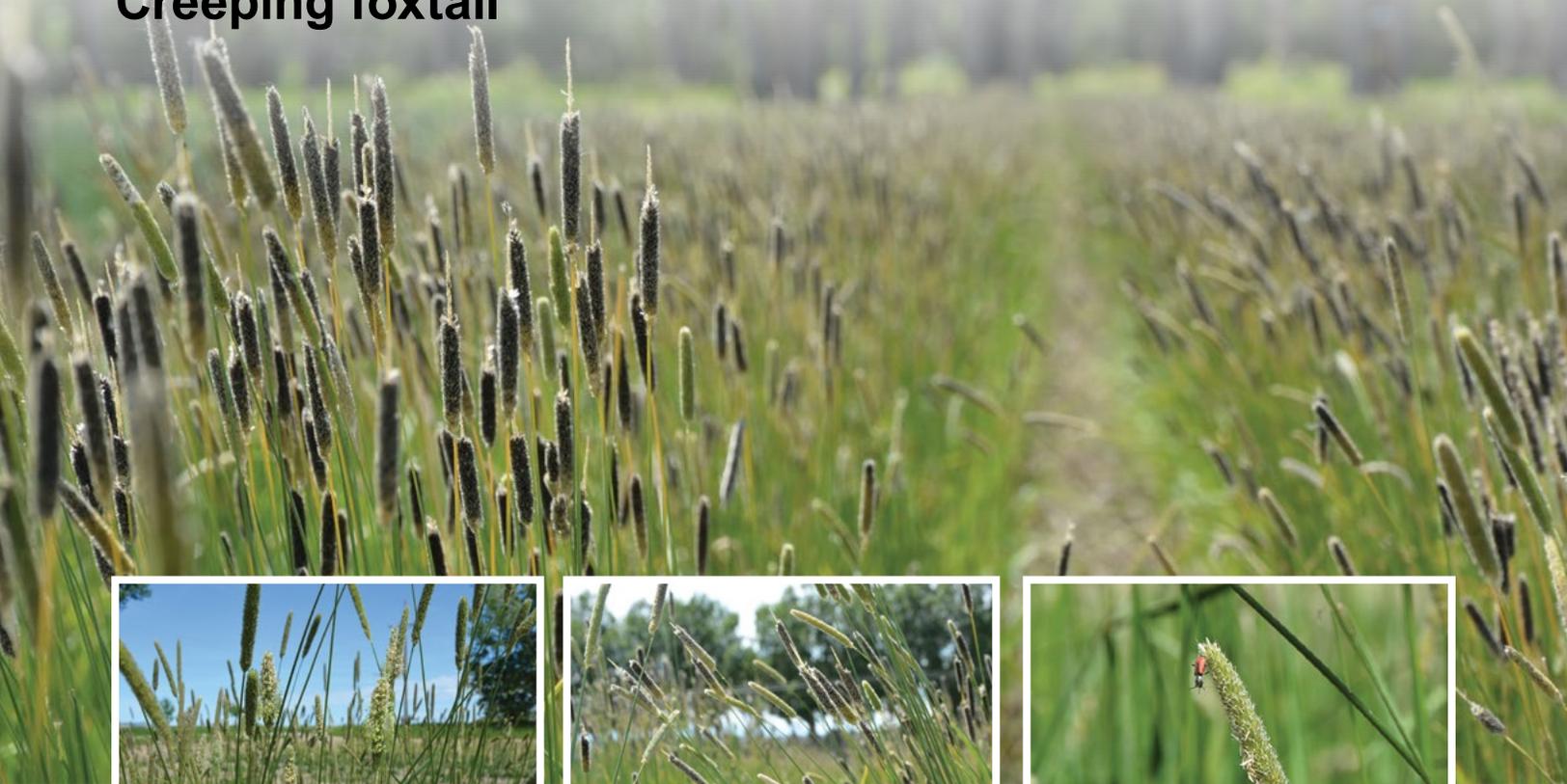
Range: Sandberg bluegrass is found growing from Alaska to the southwestern United States throughout the Intermountain West and Great Plains in dry areas. It is a common and important plant community component in the Great Plains region.

Growing Conditions: High Plains Germplasm grows best in areas receiving 10 to 14 inches of annual precipitation from 1,000 to 12,000 feet elevation. It has survived at sites receiving as little as 6 inches of precipitation in a year.

Soil Types: High Plains Germplasm is best adapted to medium textured sandy or stony soils.

'Garrison' Creeping foxtail

Alopecurus arundinaceus Poir.



720,000 seeds per pound

Release Name Meaning:

The original collection site is near the Garrison Dam in North Dakota.

Conservation Applications:



Selection Attributes: 'Garrison' is a non-native, long-lived, cool season perennial grass with aggressive rhizomes. It provides excellent quality forage that recovers quickly from grazing and tolerates trampling by livestock. Garrison can tolerate high levels of nitrogen and inundation. It grows and spreads well on saline soils, sub-irrigated areas, and along irrigation ditch banks. It can establish

and survive in areas with a frost-free period of less than 30 days.

Limitations: Creeping foxtail can become weedy, especially if not properly managed, due to aggressive rhizomes and seed readily dispersed by wind and waterways. It is likely to outcompete all other components in a seed mix, especially if planted in areas with poor soil conditions where Garrison thrives. Planting and harvesting are challenging because of its small, hairy seeds.

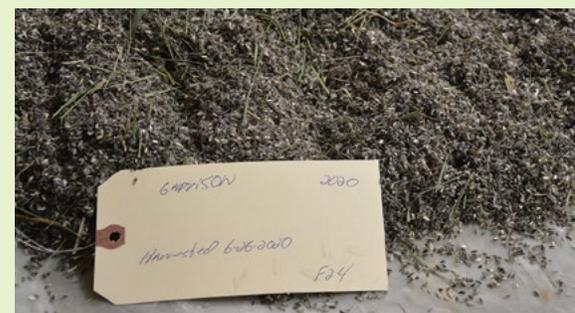
Origin: Seed was collected near Max, McLean County, North Dakota in 1950. It is native to temperate regions of Eurasia.

Range: Creeping foxtail grows most commonly on wetlands or semi-wetlands in the north central United States where it thrives in the cold climate.

Growing Conditions: Garrison grows in a wide variety of

environments but is most productive in mid to high elevations up to 9,000 feet with more than 18 inches of annual precipitation or on sub-irrigated sites.

Soil Types: Garrison grows on many soil types from sandy to mucky, performing best on wet sites and poorly drained soils where most other grasses struggle to survive. It will survive on a wide range of soil pH levels from moderately acidic (pH 5.6 to 6.0) to slightly alkaline (pH 7.9 to 8.4). It grows well in *slightly saline* soils and tolerates *moderately saline* soils.



'Rimrock' Indian ricegrass

Achnatherum hymenoides (Roem. and Schult.) Barkworth



155,000 seeds per pound

Release Name Meaning:

The original collection area is locally referred to as the "Rimrocks" for its topographical features.

Conservation Applications:



Selection Attributes: 'Rimrock' is a native, cool season perennial bunchgrass. The root system is extensive and fibrous allowing the plant to grow well on sandy or structureless soils. It is drought resistant and capable of self-seeding,

making it an important reclamation species for arid areas where wind erosion is common. Rimrock is a highly palatable food source for all classes of livestock and many wildlife species, particularly in the winter months.

Limitations: Indian ricegrass has high seed dormancy, so dormant fall planting before winter is necessary for successful establishment. Livestock preferentially graze it over many other species so it can be overgrazed without proper management.

Origin: Seed was collected from a rocky bench north of Billings, Yellowstone County, Montana in 1960. It is a sandy site at 3,600 feet elevation that averages 10 to 14 inches of annual precipitation.

Range: Indian ricegrass is found in the plains, foothills, and mountains of the western United States and Canada.

Growing Conditions: Rimrock grows at elevations from 2,000 to 10,000 feet where typical annual precipitation ranges from 8 to 14 inches but has survived in areas receiving as little as 6 inches of precipitation per year.

Soil Types: Rimrock is well adapted to coarse textured, sandy or gravelly, excessively well-drained soils with few rocks and little water-holding capacity. It can withstand slightly alkaline soils as well.



'Goshen' Prairie sandreed

Calamovilfa longifolia (Hook.) Scribn.



273,000 seeds per pound

Release Name Meaning:

The county in Wyoming where seed was originally collected.

Conservation Applications:



Selection Attributes: 'Goshen' is a native, long-lived, warm season perennial grass. It is rhizomatous with an extensive fibrous root system expanding up to 6 feet deep. It was tested against other prairie sandreed varieties and selected for its leaf size and quantity, and high seed production. It is drought tolerant

when well established and adapted to excessively well drained areas. Its tall growth provides excellent cover for many bird species.

Limitations: Goshen is intolerant of continuous grazing, trampling, and shade. It is susceptible to a variety of foliage pathogens such as leaf mold (*Hendersonia calamovilfae*), leaf spot (*Septoria calamovilfae*), and rust (*Puccinia* species).

Origin: Seed was collected near Torrington, Goshen County, Wyoming in 1959. The collection site is at 4,100 feet elevation and averages 13 inches of annual precipitation.

Range: Prairie sandreed is found in north central North America from the Rocky Mountains through the Midwest wherever sandy soils are present.

Growing Conditions: Goshen grows best on plains and hills at elevations of 2,000 to 8,000 feet with annual precipitation averaging 10 to 20 inches. It is specifically adapted to Montana and Wyoming growing conditions when compared to other prairie sandreed varieties.

Soil Types: Goshen is adapted to coarse and medium textured, well-drained soils, and is commonly found on sandy soils. It can withstand slightly alkaline soils.



Spirit Germplasm Sweetgrass (holy grass)

Hierochloa odorata (L.) Beauv.



Release Name Meaning:

The scientific name, *Hierochloa*, translates from Greek as sacred (hieros) grass (chloë). Spirit refers to its use by many American Indian tribes as a ceremonial grass to purify the body and spirit.

Conservation Applications:



Selection Attributes: Spirit Germplasm is a Selected-Class native, strongly rhizomatous, cool season perennial grass. Sweetgrass is recognized by a notable sweet, vanilla-like fragrance. Spirit Germplasm was tested against other collections of sweetgrass and proved superior in

survival, number of tillers produced, spread rate, leaf length, and biomass production.

Limitations: Sweetgrass can become weedy under ideal conditions, specifically in highly disturbed wetlands. The accepted propagation method of this species is asexual (vegetative), as it has very poor seed set.

Origin: Transplants of sweetgrass plants were taken from Toole County, Montana in 1991. The original collection site averages 28 to 30 inches of annual precipitation and is located at 3,700 feet elevation.

Range: Sweetgrass is found in the north central United States into Canada in wet meadows, prairies, and marsh edges.

Growing Conditions: Spirit Germplasm grows in moist to

saturated soil at elevations up to 11,500 feet in areas receiving more than 16 inches of annual precipitation or on sub-irrigated sites.

Soil Types: Spirit Germplasm prefers light, loose, moist soils that are medium- to coarse-textured. It has some tolerance to wet saline soils.



'Pryor' Slender wheatgrass

Elymus trachycaulus (Link) Gould
ex Shinnery ssp. *trachycaulus*



97,000 seeds per pound

Release Name Meaning:

The Pryor Mountain range is near the original collection site.

Conservation Applications:



Selection Attributes: 'Pryor' is a native, short-lived, cool season perennial bunchgrass. The root system is relatively shallow, but highly dense compared to other wheatgrass species. It has excellent first year seedling vigor due to a high

germination rate and strong seedling emergence characteristics, providing good first year ground cover. Pryor can withstand prolonged droughts and intermittent flooding. It is useful for short rotation grazing, but stands decline rapidly after 3 years. It provides good early season forage for all livestock and wildlife. Pryor has a relatively large seed compared to other slender wheatgrass releases which may contribute to improved seedling emergence and vigor.

Limitations: Pryor will dominate a seed mix if it is more than 20% of the seed mix due to its rapid establishment and competitive nature. It does not tolerate shade or waterlogged sites. Hay should be harvested before flowering for best palatability. Established slender wheatgrass stands require proper management because this species is relatively short-lived and susceptible to overgrazing.

Origin: Seed was collected from the Cottonwood Creek drainage of the Clark's Fork of the Yellowstone River in Carbon County, Montana in 1975. The area averages less than 10 inches of annual precipitation and is at 4,600 feet elevation.

Range: Slender wheatgrass is found in semiarid parts of the Intermountain West and northern Great Plains.

Growing Conditions: Pryor grows well in areas receiving at least 10 inches of annual precipitation and at elevations from 3,500 to 10,000 feet.

Soil Types: Pryor is adapted to many soil types from moist to well-drained and is *moderately saline* soil tolerant. Slender wheatgrass is commonly found growing on loamy clay soils.

Copperhead Germplasm

Slender wheatgrass

Elymus trachycaulus (Link) Gould
ex Shinnners ssp. *trachycaulus*



145,000 seeds per pound

Release Name Meaning:

The original collection was made at a historic copper smelter site.

Conservation Applications:



Selection Attributes: Copperhead Germplasm is a Selected-Class native, short-lived, cool season perennial bunchgrass. It has attributes similar to other slender wheatgrass selections such as excellent seedling vigor, good forage quality, and a dense root system. It was selected for superior emergence, survival, and biomass

production on amended acid/heavy metal impacted soil under the ambient climatic condition of the Upper Clark Fork Watershed (Deer Lodge County, Montana).

Limitations: Copperhead will dominate a seed mix if it is more than 20% of the seed mix due to its rapid establishment and competitive nature. It does not tolerate shaded or waterlogged sites.

Origin: Seed was collected east of Anaconda, Deer Lodge County, Montana in 1998. The collection site was severely impacted by smelter fallout, surface winds, water-transported pollutants, and a 4.3 pH soil. This site averages 14 inches of annual precipitation at 5,000 feet elevation.

Range: Slender wheatgrass is found in semiarid regions of the Intermountain West and Northern Great Plains.

Growing Conditions: Copperhead Germplasm grows well in areas receiving at least 10 inches of annual precipitation at elevations from 3,500 to 10,000 feet.

Soil Types: Copperhead Germplasm is adapted to many soil conditions, from deep and moist to well-drained and light textured soils. It is commonly found on loamy clay soils and is *moderately saline* tolerant. It was selected for its tolerance to heavy metal contaminated and acidic soils.



'Critana' Thickspike wheatgrass

Elymus lanceolatus (Scribn. & J.G. Sm.)
Gould ssp. *lanceolatus*



145,000 seeds per pound

Release Name Meaning:

A combination of the words "critical-area" and "Montana".

Conservation Applications:



Selection Attributes: 'Critana' is a native, long-lived, cool season perennial grass. The root system is made of dense, shallow rhizomes with several deep-feeding roots. It can grow

in areas with minimal precipitation and withstand periodic flooding because of this root system. Rapid seedling emergence and high seedling vigor results in consistent stand establishment. It provides high quality hay for livestock and provides the most forage when grazed under proper management.

Limitations: Critana has no notable limitations. It is broadly adapted to the environments of its range.

Origin: Seed was collected near Havre, Hill County, Montana in 1960. Bulk seed was collected from several roadside sites on medium to fine textured soils.

Range: Thickspike wheatgrass is common in dry regions of the northern Rocky Mountains and adjacent Great Plains.

Growing Conditions: Critana grows in areas receiving 10 to 20 inches of annual precipitation at elevations ranging from 2,000 to 7,000 feet.

Soil Types: Critana is adapted to coarse and medium textured soils and granular clays, and grows well on moderately alkaline, acidic, and some *slightly saline* soils.



'Rosana' Western wheatgrass

Pascopyrum smithii (Rydb.) Á. Löve

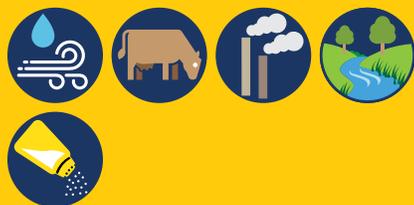


93,000 seeds per pound

Release Name Meaning:

Combination of the words "Rosebud" and "Montana".

Conservation Applications:



Selection Attributes: 'Rosana' is a native, highly rhizomatous, cool season perennial grass. The root system is shallow with several deep-feeding roots penetrating up to 5 feet in depth. It establishes easily from seed with light irrigation even in

dry areas. It is winter hardy and was selected for use in irrigated pasture or haying. Rosana has the ability to withstand droughts and spring floods. It tolerates heavy traffic from livestock and vehicles once established.

Limitations: A combination of low seedling vigor and periodic seed dormancy can result in slow stand establishment of Rosana. High levels of seed dormancy can sometimes be overcome by storing ripened seed under cool dry conditions for one year before planting.

Origin: Seed was collected northwest of Forsyth, Rosebud County, Montana in 1959, from native meadows along the Porcupine Creek drainage.

Range: Western wheatgrass grows throughout North America, but is most commonly found on moist soils in the Great Plains, Southwest, and

Intermountain West regions of the western U.S.

Growing Conditions: Rosana grows in areas with moderately rolling hills from 1,000 to 9,000 feet elevation where annual rainfall is between 10 and 20 inches.

Soil Types: Rosana is adapted to medium and fine textured soils and survives well on alkaline and *slightly saline* soils and tolerates some *moderately saline* soils.



'Trailhead' Basin wildrye

Leymus cinereus (Scribn. & Merr.) Á. Löve



131,000 seeds per pound

Release Name Meaning:

The original collection site was the starting point of the 1989 Montana Centennial Cattle Drive trail.

Conservation Applications:



Selection Attributes: 'Trailhead' is a native, large-statured, long-lived, cool season perennial bunchgrass. The root system is extensive, deep, coarse, and fibrous. It was selected from other basin wildrye seed sources

due to its superior drought tolerance, overall plant height and growth, and stand longevity. It is winter hardy, and combined with its expansive, tall growth it provides excellent cover for many bird species and wind protection for calves. When flowering, it produces large quantities of pollen for insects. When fully dormant the plant can be cut, grazed, or burned without long-term negative effects.

Limitations: Trailhead requires careful management to prevent overgrazing because the growing point of basin wildrye is higher than other bunchgrasses. Seedling vigor is fair, but the species establishes slowly so it is recommended to wait until after the second fall before allowing grazing. Spring grazing will also damage the growth points and lead to stand failure.

Origin: Seed was collected from a large rangeland site near Roundup,

Musselshell County, Montana in 1959. The collection site is at 3,600 feet elevation with silty soils and averages 10 to 14 inches of annual precipitation.

Range: Basin wildrye is mostly found on deep, well-drained soils throughout the prairies and foothills of western North America but has a wide range of climatic adaptability.

Growing Conditions: Trailhead grows best in areas receiving 8 to 20 inches of annual precipitation at elevations from 2,000 to 9,000 feet. It has been used successfully for reclamation projects in areas receiving as little as 5 inches of annual precipitation but requires a higher water table on these sites.

Soil Types: Trailhead is adapted to many soil types and textures but prefers deep and high water-holding capacity soils.

Washoe Germplasm Basin wildrye

Leymus cinereus (Scribn. & Merr.) Á. Löve



176,000 seeds per pound

Release Name Meaning:

The original collection site was the historic Washoe smelter stack.

Conservation Applications:



Selection Attributes: Washoe Germplasm is a Selected-Class native, large-statured, long-lived, cool season perennial bunchgrass. It has attributes similar to other basin wildrye selections such as tall growth, winter hardiness, and an expansive root system. On test sites near Anaconda,

Montana, it performed better than other tested selections at establishing on former mine lands characterized by soils that were acidic or contained high levels of heavy metals. When fully dormant, basin wildrye can be cut, grazed, or burned without long-term negative effects.

Limitations: Basin wildrye requires careful management to prevent overgrazing because the growing point of basin wildrye is higher than other bunchgrasses. Seedling vigor is fair, but the species establishes slowly so it is recommended to wait until after the second fall before allowing grazing. Spring grazing will also damage the growth points and lead to stand failure.

Origin: Seed was collected from a copper smelter fallout site near Anaconda, Deer Lodge County, Montana in 1998. The site soil pH was as low as 4.6 with elevated levels of heavy metals and sulfur compounds.

The collection site is at 5,000 feet elevation and averages 14 inches of annual precipitation. Washoe Germplasm was selected by harvesting only the first emerging seeds of the original selection when grown on contaminated soils.

Range: Basin wildrye is mostly found on deep, well-drained soils throughout the prairies and foothills of western North America but has a wide range of climatic adaptability.

Growing Conditions: Washoe Germplasm grows best in areas receiving 8 to 20 inches of annual precipitation at elevations from 2,000 to 9,000 feet of elevation.

Soil Types: Washoe Germplasm is adapted to many soil types and textures but prefers deep and high water-holding capacity soils. It grows on acidic, heavy metal contaminated soils, as well as excessively well drained sites.

'Shoshone' Manystem wildrye

Leymus multicaulis (Kar. & Kir.) Tzvelev



181,000 seeds per pound

Release Name Meaning:

An American Indian tribe with a long history at the original collection site.

Conservation Applications:



Selection Attributes:

'Shoshone' is a non-native, rhizomatous, cool season perennial grass. Roots are well branched, extensively covering the top 2 feet of soil with some roots extending down to 5 feet. This selection was chosen primarily for forage production, soil stabilization,

and cover on wetlands and wet saline soils. It is very winter hardy making it well-suited for the harsh winters of the Intermountain West. In general, it provides fair to moderate forage for all livestock during the growing season.

Limitations: High levels of seed dormancy and poor seedling vigor lead to slow stand establishment and an inability to compete with weeds. Establishment can be improved when seed is fall-dormant planted or mechanically scarified before spring planting. It does not provide good forage when planted on salt-affected sites. It is susceptible to ergot, reducing seed production.

Origin: Seed was collected in Riverton, Fremont County, Wyoming in 1958. The collection site is at 4,950 feet elevation along the Wind River that averages 5 to 9 inches of annual precipitation. It is native to Eurasia, from southern Russia to western China.

Range: Manystem wildrye is only found in the Intermountain West where wet, saline to alkaline soils occur in uplands, slopes, or bottomlands.

Growing Conditions: Shoshone grows at all elevations up to 8,400 feet where annual precipitation exceeds 14 inches, or there is sufficient soil moisture present from sub-irrigation.

Soil Types: Shoshone is adapted to both poorly drained sandy or coarse textured soils and tolerates highly alkaline soil (pH 6.6 to 9.0) and grows well on *moderately saline* soils and even tolerates some *strongly saline* soils.



Legumes & Forbs



Meriwether Germplasm Blanketflower

Gaillardia aristata Pursh



220,700 seeds per pound

Release Name Meaning:

In honor of Captain Meriwether Lewis of the Lewis and Clark Expedition who collected a specimen of blanketflower along the Blackfoot River in Montana.

Conservation Applications:



Selection Attributes: Meriwether Germplasm is a Selected-Class native, yellow- to orange-flowered, perennial forb. It has a deep tap root making it drought tolerant. It was primarily selected to add diversity to native seed mixes. It establishes quickly and easily

and has a long flowering season. It is widely used by pollinating insects, wildlife species, and livestock for food and cover. Blanketflower is one of the most extensively distributed forbs in its range.

Limitations: In flood events or on poorly drained soils, powdery mildew and root rot can occur.

Origin: Meriwether Germplasm is a composite of 15 collections of blanketflower made in 1989 to 1996 from a wide variety of site conditions across Montana and Wyoming.

Range: Blanketflower is found throughout Canada and the northern United States, as well as throughout the mountains and foothills of the western United States.

Growing Conditions: Meriwether Germplasm grows on sites receiving 10 to 30 inches of annual precipitation

at elevations of 1,300 to 9,000 feet, with optimum growth occurring in full sun.

Soil Types: Meriwether Germplasm is successful in a wide variety of soil types from loamy to sandy, dry to well-drained mesic areas, and slightly acidic to mildly alkaline sites.



'Lutana' Cicer (chickpea) milkvetch

Astragalus cicer L.



122,000 seeds per pound

Release Name Meaning:

Combination of the words "luteus" (meaning yellow in Latin and referring to seed color) and "Montana".

Conservation Applications:



Selection Attributes: 'Lutana' is a non-native, long-lived, pale yellow to white flowered, non-bloat perennial legume. The creeping root system grows vigorously and has a short, stout taproot that can survive severe cold temperatures. The root system helps prevent soil erosion and improve soil quality by fixing nitrogen. The original

selection criteria for Lutana was based on early spring growth, rapidness of regrowth, speed of rhizome spread, and uniformity of seed maturity or ripeness. Readily eaten by all classes of livestock and wildlife, it is especially well-suited for grazing and conservation plantings.

Limitations: Lutana is susceptible to stem, root, and crown-rot, but plants usually recover from this naturally. Germination rates of harvested seed are between 1% and 25%, however mechanical scarification and inoculation prior to planting results in good germination and stand establishment. Stems tend to be coarser than alfalfa making it less palatable by comparison. Regrowth after cutting is slower than alfalfa.

Origin: Cicer milkvetch was introduced to the United States from Sweden in 1926. In 1966, the Montana-Wyoming Plant Materials

Center established 252 cicer milkvetch plants and retained 127 of those for a Breeder population based on desirable characteristics.

Range: Cicer milkvetch grows well in western North America from Alaska to New Mexico, spanning as far east as the Great Plains, but is primarily adapted to the Rocky Mountain range.

Growing Conditions: Lutana grows best in areas between 2,000 and 7,000 feet of elevation with 18 to 35 inches of annual precipitation, however, it will establish and survive in areas receiving less than 14 inches of annual precipitation.

Soil Types: Lutana is adapted to clay and sandy soils that are moderately coarse-textured and will grow on slightly acidic to alkaline soils (pH 6.1 to 8.4).

Old Works Germplasm Fuzzytongue penstemon

Penstemon eriantherus Pursh
var. *eriantherus*



358,000 seeds per pound

Release Name Meaning:

The first smelter built at the Anaconda Smelter Superfund Site near Anaconda, Montana, was named "Old Works".

Conservation Applications:



Selection Attributes: Old Works Germplasm is a Source-Identified native, purple- to blue-flowering, perennial forb, with a large taproot. It was selected for its ability to grow in acidic and heavy-metal contaminated soils for use in mine land reclamation projects. It supports pollinating insects and enhances wildlife habitat and food. Old Works Germplasm is well

adapted to dry, open rangelands and is drought tolerant and winter hardy.

Limitations: Fuzzytongue penstemon establishes slowly so managing weeds is important for successful stand establishment. Seed dormancy is overcome by dormant fall planting.

Origin: Seed was collected from more than 50 plants found growing in a copper smelter fallout site near Anaconda, Deer Lodge County, Montana in 1998. The site had a soil pH of 5.8 with elevated levels of heavy metals and sulfur compounds. The collection site is at 5,720 feet elevation and averages 12 to 14 inches of annual precipitation.

Range: Fuzzytongue penstemon is found mostly in the Intermountain West from southern Canada south to Colorado in prairies, valleys and foothills of this range.

Growing Conditions: Old Works Germplasm grows in areas receiving 12 to 14 inches of annual precipitation from 2,000 to 8,000 feet elevation in dry, open terrain.

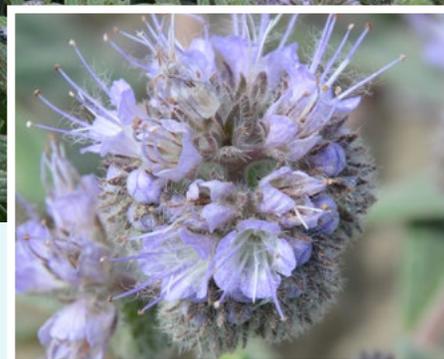
Soil Types: Old Works Germplasm is adapted to well-drained loamy and sandy soil, and can tolerate excessively well-drained soils given 12 to 14 inches or more of annual precipitation. It grows in acidic and heavy-metal contaminated soils.



Stucky Ridge Germplasm

Silverleaf phacelia

Phacelia hastata
Douglas ex Lehm.



153,000 seeds per pound

Release Name Meaning:

The original seed collection site was near Stucky Ridge, north of Anaconda, Montana.

Conservation Applications:



Selection Attributes: Stucky Ridge Germplasm is a Selected-Class native, purple-flowered, perennial forb. It was selected for its tolerance to acidic and heavy metal contaminated soils. It is a useful species for many pollinating insects, including native bees, because it has an extended

blooming period from May to September. It is drought tolerant due to a prominent tap root.

Limitations: Stucky Ridge Germplasm should be dormant fall planted to overcome seed dormancy. Low stature can make it difficult to harvest seed.

Origin: Seed was collected from a site with soil containing high concentrations of heavy metals and an acidity of 5.7 pH, located north of Anaconda, Deer Lodge County, Montana in 1998. The collection site is at 5,000 feet elevation and averages 14 inches of annual precipitation.

Range: Silverleaf phacelia is found from southwestern Canada, south through California and east to Nebraska primarily in prairies and rangeland.

Growing Conditions: Stucky Ridge Germplasm grows from 2,000 to 8,000 feet elevation in areas receiving an average annual precipitation of 10 to 14 inches.

Soil Types: Stucky Ridge Germplasm is adapted to dry, sandy or gravelly soils in rocky gullies or within valley grasslands. It tolerates moderately acidic and heavy-metal contaminated soils.



Stillwater Germplasm

Upright prairie coneflower

Ratibida columnifera
(Nutt.) Woot. & Standl.



600,000 seeds per pound

Release Name Meaning:

Named for Stillwater County, Montana, one of the original seed collection sites.

Conservation Applications:



Selection Attributes: Stillwater Germplasm is a Selected-Class native, late-season, yellow-flowered, perennial forb. It has a prominent taproot and a woody base. It was primarily selected to add diversity in native seed mixes. The composite of five seed sources was created by choosing the most vigorous growing and easiest establishing plants from those

accessions. Stillwater Germplasm is highly nutritious forage for livestock and wildlife, while also creating good structure for upland bird nests. It is winter hardy and drought tolerant.

Limitations: Seedling vigor and stand establishment can be weak, but Stillwater Germplasm is hardy once established and can be used to deter invasive species growth. It is susceptible to powdery mildew.

Origin: Stillwater Germplasm is a composite of five accessions collected in 1989. The collections were made in Carbon and Stillwater Counties from sites ranging from 3,600 to 5,380 feet elevation and averaging 10 to 20 inches of annual precipitation.

Range: Upright prairie coneflower is commonly found from south central Canada to northern Mexico from the Intermountain West to the Great Plains regions of the United States in dry, open sites.

Growing Conditions: Stillwater Germplasm grows primarily in prairie grasslands and mountain foothills at sites between 3,200 to 8,400 feet elevation that receive 10 to 30 inches of annual precipitation. It commonly grows on disturbed sites such as roadside rights-of-way.

Soil Types: Stillwater Germplasm can survive on a wide variety of soils but prefers loamy and gravelly soils. It tolerates slightly acidic to moderately alkaline soils.



Antelope Germplasm

White prairie clover

Dalea candida Michx. ex Willd.



278,000 seeds per pound

Release Name Meaning:

White prairie clover is regularly browsed by antelope.

Conservation Applications:



Selection Attributes: Antelope Germplasm is a Tested-Class native, perennial, legume with a woody base. It has a deep, strong taproot accompanied by weakly branching roots. It is an excellent addition to seeding mixes for a variety of applications because it improves soil quality by fixing nitrogen and can be used as a pioneer species on disturbed

shallow soils. Antelope Germplasm is palatable and nutritious to all classes of livestock and many wildlife species browse it throughout the year.

Limitations: Antelope Germplasm survives poorly on salt-affected sites or lowland soils with high moisture holding capacity. Based on research conducted at the MTPMC, Antelope Germplasm is susceptible to damage from two arthropod species, a cerambycid (*Megacyllene angulifera*) and a lepidopteran (*Walshia* spp.) that can cause high plant mortality.

Origin: Seed was collected west of Dickinson, Stark County, North Dakota in 1947. The collection site is at 2,500 feet elevation and averages 15 inches of precipitation annually.

Range: White prairie clover is found growing throughout central North America, from southern Manitoba

west to Alberta, and south through the United States into Mexico. It is considered a highly important legume to the Great Plains region.

Growing Conditions: Antelope Germplasm commonly grows on sites receiving 10 to 18 inches of annual precipitation in grass prairie communities below 3,000 feet of elevation.

Soil Types: Antelope Germplasm is adapted to well-drained soils including those that are sandy, silty, or gravelly.



Great Northern Germplasm Western yarrow

Achillea millefolium L.
var. *occidentalis* DC.



4,400,000 seeds per pound

Release Name Meaning:

Named after the historic Great Northern Railway that passed through the original collection site.

Conservation Applications:



Selection Attributes: Great Northern Germplasm is a Selected-Class native, long-lived, white-flowered, perennial forb, that grows from creeping rootstocks. It was primarily selected for adding diversity to seed mixtures and its ease of establishment on disturbed sites. This selection was superior in height, seedling vigor and survival,

and seedhead production compared to other yarrow seed sources tested. It is an important food source for sage grouse and upland birds, and forage for many wildlife species and livestock. While it spreads easily and is widely adapted to North America, it is generally not considered weedy or invasive. Great Northern Germplasm prefers direct sunlight and is drought tolerant.

Limitations: Under favorable environmental conditions, such as moist and heavily disturbed sites, western yarrow can outcompete other native species and overtake a pasture that has been overgrazed. In poorly drained soils, root rot can occur. It is also susceptible to a variety of insect pests. The required shallow planting depth of this species can be problematic when yarrow is included in mixes with other species requiring deeper planting.

Origin: Seed was collected from slopes along Canyon Creek Road in Flathead County, Montana in 1988. The collection site is at 3,800 feet elevation and averages 28 to 30 inches of annual precipitation.

Range: Western yarrow is one of the most adaptable wildflowers in North America, growing from Alaska across northern Canada, through the United States into Mexico.

Growing Conditions: Great Northern Germplasm grows in a wide range of precipitation zones from 2,400 to 12,000 feet elevation in open sagebrush and grassland areas to subalpine forests.

Soil Types: Great Northern Germplasm is adapted to shallow, thin soils such as gravelly, loamy or sandy sites.

Shrubs & Trees



Ekalaka Germplasm

Bur oak

Quercus macrocarpa
Michx.



279 seeds per pound

Release Name Meaning:

Ekalaka, Montana was one of the original collection sites, contributing 6 of the 24 original seed sources that comprise this release.

Conservation Applications:



Selection Attributes: Ekalaka Germplasm is a Selected-Class native, long-lived, medium- to tall-statured deciduous tree with a 20-year average height of 15 to 18 feet. It is very durable, with strong branches and tolerance to cold winters and drought conditions. This release was selected for its superior seedling survival, consistent growth habits, and good form for windbreak establishment at

the western edge of its range. Ekalaka Germplasm is considered a pioneer species because it propagates easily by dropping large crops of acorns every 2 or 3 years. It has few pest and disease problems while providing excellent habitat for many wildlife species.

Limitations: Bur oak is typically intolerant of shaded sites and prolonged flooding. It is browsed in its establishing years by livestock and wildlife species. Bur oak is slow growing, especially in the western part of its native range, however Ekalaka Germplasm was selected for its better than average rate of height growth. Acorns are favored by deer, racoons, squirrels, and other wildlife making collection difficult. Oak bullet gall wasp can produce unsightly galls on bur oak stems.

Origin: Wildland bur oak collections were made from 24 sites across the Great Plains region in North Dakota, Montana, and South Dakota from 1991 to 1992 from individual trees that

were at least 30 years old and showed superior characteristics. The collections were made at elevations ranging from 1,400 to 3,750 feet on sites averaging from 10 to 26 inches of precipitation.

Range: Bur oak is found from south central Canada, south through the central and eastern United States reaching parts of Oklahoma, Arkansas, and Tennessee. The western edge of its range reaches far eastern Montana and Wyoming.

Growing Conditions: Ekalaka Germplasm grows best below 5,500 feet elevation in areas receiving at least 10 inches of annual precipitation. It survives the variable conditions of the northern Great Plains, typically in valley floors, woody drainages and prairies at the border of riparian areas.

Soil Types: Ekalaka Germplasm will survive on most soil types from rocky hillsides to heavy clay soils as long as it receives full sun. It can also survive on *slightly saline* soils.

'Wytana' Moundscale (formerly fourwing saltbush)

Atriplex x aptera A. Nelson (pro sp.)
[*canescens x nutallii*]



**49,000 seeds per pound
(dewinged)**

Release Name Meaning:

Combination of the words "Wyoming" and "Montana"; its primary area of adaptation.

Conservation Applications:



Selection Attributes: 'Wytana' is a native, 1- to 5-foot tall, long-lived woody perennial. It is a naturally occurring hybrid of fourwing saltbush and Gardner's saltbush. The extensive root system and strong tap root

extends up to 30 feet deep, making this a winter hardy, drought tolerant plant. It will establish easily from seed or by transplants, and natural reproduction is common on rangelands. Many wildlife species use this shrub year-round for habitat and forage.

Limitations: Moundscale can cause bloat and scours when overeaten by livestock, but this is easily avoidable with proper grazing management. It is susceptible to insect infestations leading to leaf and seed damage.

Origin: Seed was collected near Roundup, Musselshell County, Montana in 1960. The collection site is at 3,400 feet elevation and averages 12 inches of annual precipitation.

Range: Moundscale is found throughout the western United States but is most common east of the Continental Divide in dry, desert shrublands of the region.

Growing Conditions: Wytana grows in areas receiving 6 to 15 inches of annual precipitation and can be found at all elevations up to 8,500 feet.

Soil Types: Wytana can grow on a wide range of soil types and textures as long as the site is well-drained. It is best adapted to sandy, silty, and gravelly soils, and grows well on acidic, *moderately saline*, and slightly alkaline soils.



Hunter Germplasm

Ponderosa pine

Pinus ponderosa Lawson & C. Lawson
var. scopulorum Engelm.



12,095 seeds per pound

Release Name Meaning:

Named in honor of Harold (Hal) Everett Hunter, the former NRCS Montana State Forester who was instrumental in advancing tree and shrub science at the MTPMC.

Conservation Applications:



Selection Attributes: Hunter Germplasm is a Selected-Class native evergreen tree averaging a 20-year height of 17 feet and commonly growing to a height of 45 feet or greater over its lifetime. This selection was released primarily to provide a well-adapted, fast-growing evergreen

component for windbreaks and shelterbelts east of the Continental Divide. Hunter Germplasm exhibits superior height growth, seedling survival, and overall vigor. It survives the harsh conditions of the Great Plains and Intermountain West because it tolerates drought and is winter hardy. This species is also useful for enhancing wildlife habitat as many birds and small mammals consume the seeds and use the branches for nesting or cover.

Limitations: Too much shade or browsing by wildlife and livestock may cause a loss of established plants. Browsing needles may cause abortion in cattle. While ponderosa pine prefers areas with little precipitation and well-drained soils, seedling emergence can be hindered by insufficient soil moisture. Excessively wet, compacted, saline, or poorly drained sites are detrimental to ponderosa pine survival.

Origin: The origin of Hunter Germplasm is seed collected in 1989 from 38 parent trees from 12 sites across Nebraska, Montana, and South Dakota. The seeds are a composite of a 200-tree orchard located at the MTPMC.

Range: This variety of ponderosa pine grows east of the Continental Divide, mostly in the northern United States in direct sunlight on drier sites.

Growing Conditions: Hunter Germplasm grows best below 5,500 feet in areas receiving 10 to 25 inches of annual precipitation.

Soil Types: Hunter Germplasm is adapted to a variety of soil types but grows best on well-drained, coarse-textured soils. It can withstand slightly acidic soils.



Bridger-Select Germplasm Rocky Mountain juniper

Juniperus scopulorum Sarg.



27,100 seeds per pound

Release Name Meaning:

These trees were “selected” based on superior attributes as tested at the MTPMC.

Conservation Applications:



Selection Attributes: Bridger-Select Germplasm is a Selected-Class native, long-lived, evergreen shrub or small tree. It was selected for superior height growth, uniformity of shape, overall species vigor, and seedling survivability. It withstands periodic droughts or irregular precipitation, highly variable temperatures, strong

winds, and heavy snowstorms. It has few insect or disease problems and provides excellent cover and food for many wildlife species and is useful for a multi-row windbreak. The 20-year height of Bridger-Select Germplasm averages 13 to 15 feet.

Limitations: Rocky Mountain juniper will struggle to survive in excessively wet areas that hold moisture for prolonged periods of time. Seeds must be dormant fall planted to break seed dormancy and improve establishment the following spring. Certain fungal diseases and mites are periodically problematic.

Origin: Bridger-Select Germplasm is a bulk of 26 different collection sites across Montana, North Dakota, Wyoming, Nebraska, and South Dakota collected between 1989 and 1994. This release is a composite of seeds collected from superior

performing trees and used to establish a seed orchard located at the MTPMC.

Range: Rocky Mountain juniper is broadly adapted to the Great Plains and foothills of the Intermountain West, typically in direct sunlight on dry or well-drained sites.

Growing Conditions: Bridger-Select Germplasm grows best below 5,000 feet of elevation in areas receiving at least 10 to 12 inches of annual precipitation.

Soil Types: Bridger-Select Germplasm is adapted to soils that are very well-drained, and typically erodible and shallow. It will survive on highly acidic and poorly developed soils as well.

Mill Creek Germplasm Silver buffaloberry

Shepherdia argentea
(Pursh) Nutt.



40,000 seeds per pound

Release Name Meaning:

Named for Mill Creek, a creek near the original collection site south of Anaconda, Montana.

Conservation Applications:



Selection Attributes: Mill Creek Germplasm is a Selected-Class native, thicket-forming, 3 to 20 feet tall shrub or small tree. It was primarily selected for its survivability on acidic and heavy-metal contaminated soils. Silver buffaloberry provides excellent cover and source of food for many species of

birds and browsing wildlife. It spreads easily through new shoots (suckers) creating low, dense shelterbelts. It enhances plant communities, by adding nitrogen to the soil through its root system, especially in low fertility soils.

Limitations: Silver buffaloberry produces suckers that can take root in unwanted areas, especially creating problems in agricultural plantings. It is thorny so caution should be used when working with this plant or hand collecting fruit and seed. When consumed in large quantities, the berries may cause digestive problems in animals, including livestock species and humans. Older plants may be susceptible to disease, but pruning will help the plant survive longer and be healthier.

Origin: Seed was collected south of Anaconda, Deer Lodge County, Montana in 1995, in a site that was disturbed by wind and water erosion,

and containing soils that were contaminated by smelter fallout from the Anaconda superfund site. The collection site is at 5,000 feet elevation and averages 14 inches of annual precipitation.

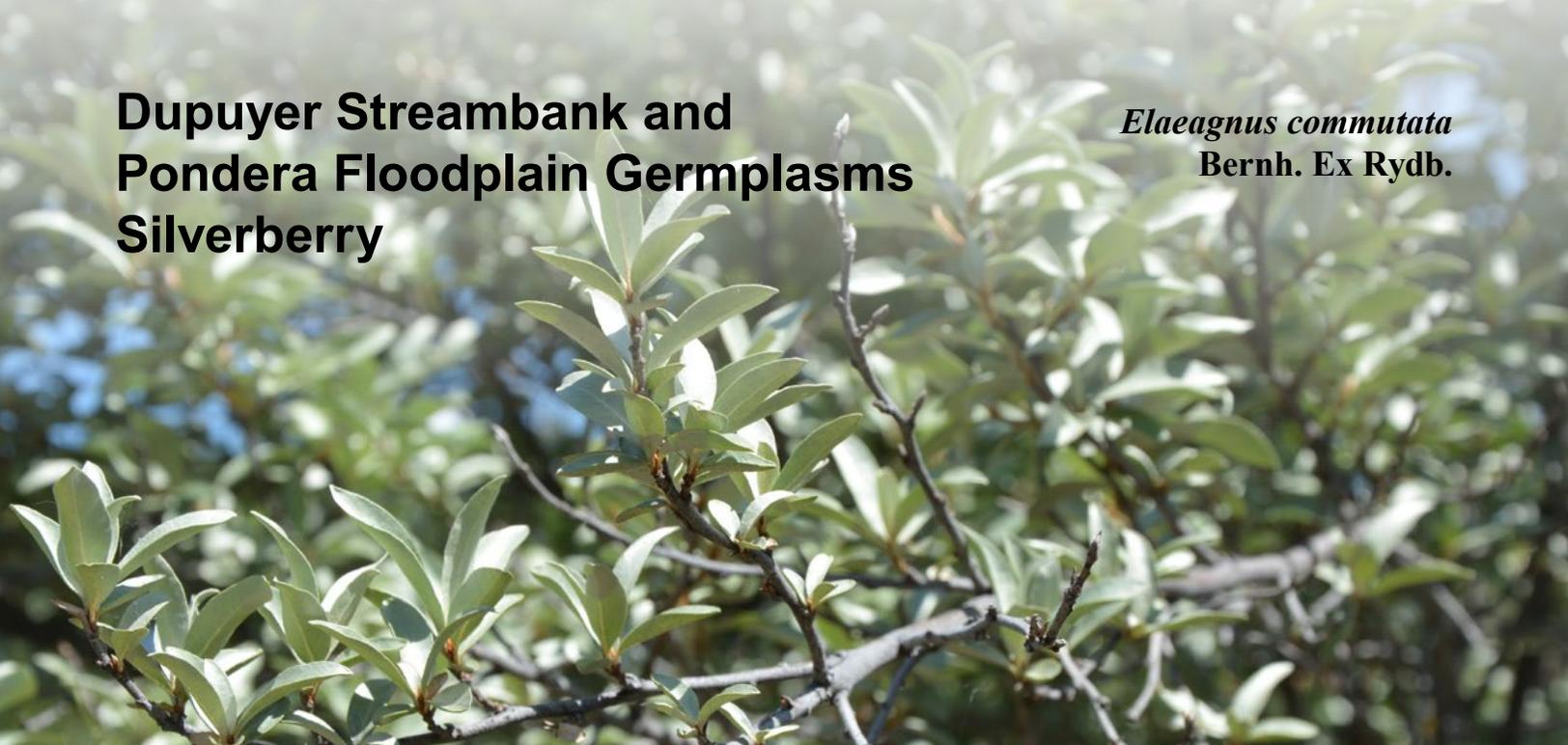
Range: Silver buffaloberry is found primarily in the Great Plains, with the full range including western prairies of southern Canada, south through the western United States and reaching as far east as the Midwest.

Growing Conditions: Mill Creek Germplasm grows at elevations up to 7,500 feet receiving 15 to 20 inches of average annual precipitation or on sites that are moist and well drained throughout the year.

Soil Types: Mill Creek Germplasm is adapted to a wide range of soil conditions, but prefers sandy, moist soils. It tolerates *moderately saline*, acidic, and heavy-metal contaminated soils.

Dupuyer Streambank and Pondera Floodplain Germplasms Silverberry

Elaeagnus commutata
Bernh. Ex Rydb.



3,800 seeds per pound

Release Name Meaning:

Named for the original collection site, Dupuyer Creek in Pondera County, Montana.

Conservation Applications:



Selection Attributes: Dupuyer Streambank and Pondera Floodplain Germplasms are both Source-Identified releases of silverberry, a long-lived, native shrub. Silverberry was identified as an effective species for protecting streambanks and mesic areas from erosion by spreading rhizomes which are especially useful in soil stabilization.

Although it spreads easily once established, it does not become weedy. It provides good habitat and fruit for wildlife, mainly birds. Silverberry is winter hardy and tolerates temporary flooding yet is also drought tolerant and thrives in direct sunlight. It also improves soil health by adding nitrogen to the soil and has been shown to improve production of other species when planted nearby.

Limitations: Silverberry seeds may take up to two years to germinate after planting, but once established can spread easily via underground shoots. It does not tolerate shade well. Heavy crown rust has been documented in Canada. Silverberry can take over pastures that are overgrazed by spreading into disturbed areas devoid of grass.

Origin: Seed was collected from two locations in 1997 within a single site in Pondera County, Montana along Dupuyer Creek. One location was a floodplain terrace and the silverberry growing

there was named Pondera Floodplain Germplasm; Dupuyer Streambank Germplasm was found growing in the bottomlands nearby. This area is at 3,850 feet elevation and receives 12 to 14 inches of average annual precipitation.

Range: Silverberry is distributed across northwestern North America throughout the Great Plains and Intermountain West into Canada in wetland or riparian corridors in open areas where it can receive direct sunlight.

Growing Conditions: Silverberry grows in areas averaging 12 inches or more of annual precipitation and on soils with high soil water holding capacity, such as mesic, wetland, or riparian areas, primarily below 8,000 feet elevation.

Soil Types: Loamy soil is best for silverberry growth, although it is commonly found in dry, sandy, or gravelly soils, and other easily erodible surfaces. It also survives in highly acidic soils and grows well in *slightly saline* soils and tolerates some *moderately saline* soils.

Prospectors Germplasm

Common snowberry

Symphoricarpos albus [L.] S.F. Blake



72,000 seeds per pound

Release Name Meaning:

The Anaconda Smelter Superfund Site, started by mineral prospectors, was near the original collection site.

Conservation Applications:



Selection Attributes:

Prospectors Germplasm is a Selected-Class native, rhizomatous, perennial shrub. It was selected for reclamation of former mine lands with acidic and heavy metal contaminated soils. It provides good

forage and shelter for many wildlife species and livestock, especially in winter. It is used for windbreak establishment and to control erosion because it produces dense thickets of shoots. Prospectors Germplasm is drought and fire tolerant, and fairly winter hardy.

Limitations: Common snowberry typically establishes slowly but survives and spreads easily afterwards. It should be dormant fall planted to overcome seed dormancy.

Origin: Seed was collected in Anaconda, Deer Lodge County, Montana in 1998 about one half mile from a smelter stack at the Anaconda Smelter Superfund Site. This site is at 6,000 feet elevation, averages 12 to 14 inches of annual precipitation, and had a 4.1 soil pH.

Range: Common snowberry is found throughout the northern United States and southern Canada on slopes and in

valley bottoms of foothills, either in moist clearings or open forests.

Growing Conditions: Prospectors Germplasm grows at all elevations up to 8,000 feet in areas averaging 12 to 20 inches of annual precipitation where it receives near-full sun.

Soil Types: Prospectors Germplasm is adapted to a wide variety of soils, preferring well-drained, moist sites. It performs well on moderately acidic and heavy metal contaminated soils.



Trapper Germplasm Western snowberry

Symphoricarpos occidentalis Hook.



74,400 seeds per pound

Release Name Meaning:

The main purpose of this release is as a living snow fence or shelterbelt species to “trap” snow or sediment.

Conservation Applications:



Selection Attributes: Trapper Germplasm is a Selected-Class native, rhizomatous, perennial shrub. It was selected for superior seedling survival and vigor compared to other western snowberry sources. It is a useful species for living snow fences, erosion

control projects, and providing shelter for wildlife because it grows in dense thickets from spreading roots. Trapper Germplasm also provides good browse for many wildlife species. It easily establishes and spreads on a broad variety of sites but does not become invasive. It is drought tolerant, re-sprouts after fire, and is winter hardy.

Limitations: Seeds exhibit dormancy and require fall planting for optimum and uniform germination.

Origin: Seed was collected from five seed sources across Montana and Wyoming from 1981 to 1984. The original collections were made at sites averaging 11 to 30 inches of annual precipitation at 2,700 to 4,800 feet elevation. A 329-shrub seed orchard is maintained at the MTPMC.

Range: Western snowberry is found throughout most of the United States and Canada. It is most common through the Intermountain West and

Great Plains regions on moist, well-drained sites.

Growing Conditions: Trapper Germplasm grows from 800 to 10,000 feet elevation in many environments receiving an average 15 to 30 inches of annual precipitation.

Soil Types: Trapper Germplasm is adapted to most soil types except for heavy textured soils, preferring moist to wet, fertile soils. It has some tolerance to wet *slightly saline* soils.





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