

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
PLANT MATERIALS CENTER
BRIDGER, MONTANA**

and

**MONTANA AGRICULTURAL EXPERIMENT STATIONS
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA**

and

**WYOMING AGRICULTURAL EXPERIMENT STATIONS
UNIVERSITY OF WYOMING
LARAMIE, WYOMING**

**NOTICE OF RELEASE OF
MERIWETHER GERmplasm BLANKETFLOWER**

SELECTED CLASS OF NATURAL GERmplasm

The Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA), Agricultural Experiment Stations-Montana State University, and Wyoming Agricultural Experiment Stations-University of Wyoming announce the pre-varietal release for a Selected Class germplasm of blanketflower (*Gaillardia aristata* Pursh) for the intermountain west and the Northern Great Plains regions. As a Selected Class release this plant will be referred to as Meriwether Germplasm blanketflower. It has been assigned the NRCS accession number 9081828.

This alternative release procedure is justified because there is an immediate need for native forbs to re-vegetate disturbed areas and re-establish native plant communities in conservation enhancement and wildlife improvement programs, supply nectar and pollen for pollinators and other beneficial insects, furnish food and cover for nesting and brood-rearing sage-grouse, upland game and song birds, as well as many other classes of wildlife, and as a drought-tolerant alternative in low-maintenance and naturalistic landscapes. There are no other northern adapted conservation releases of native blanketflower available to the commercial seed industry.

Collection Site Information: Meriwether Germplasm is a composite of 15 accessions as shown in appendix table 1. Taxonomic nomenclature is cited as per the USDA PLANTS database (USDA-NRCS, 2009).

Description: *Gaillardia aristata* blanketflower is a native, herbaceous perennial in the Aster family. *Gaillardia* was named in honor of Gaillard de Marentonneau, an 18th century French patron of botany (Bailey, 1929). The name *aristata* is derived from botanical Latin in reference to the hairy stems and leaves, and the awn-like bristles on the single-seeded fruit (achene). The blanketflower inflorescence is said to resemble the colorful, intricate patterns woven into blankets made by Native Americans (Kimball and Lesica, 2005). Blanketflower is found in grasslands, woodlands, and montane meadows. Its natural range extends from southern Canada on both sides of the Rocky Mountains, south to Utah, Colorado, and South Dakota (Strickler, 1993). It prefers dry, open spaces in prairies, mountain foothills, and along roadsides and railroad rights-of-way (Vance et al., 1999). Blanketflower is a mid-successional species capable of growing in dense populations on disturbed sites (Taylor, 1992). It is adapted to a wide range of well-drained soils and is drought tolerant. Blanketflower grows well on dry to mesic, well-drained sites in areas receiving 254 to 762 millimeters (10 to 30 inches) of annual precipitation. Plant growth and development is dependent on site location, with a wide range of dates in emergence and floral initiation.

Blanketflower is tap-rooted, with one or commonly several, erect stems from the base (Hitchcock et al., 1955). The pubescent plant grows to a height of 67 cm (26 inches) with rough-hairy, lance-shaped, alternate leaves, 15 centimeters (6 inches) long, 2.5 centimeters (1 inch) wide, entire to coarsely-toothed, or rarely pinnately divided (USDA-FS, 1966). The flower heads are radiate, showy, solitary to few, with an outer series of ray flowers and an inner group of disk flowers. There are typically 13, sterile, 15 to 35 millimeters (0.6 to 1.4 inches) long, ligulate (strap-shaped), yellow ray flowers with purple bases (eFloras, 2009). The number and shape of the ray flowers is variable, as is the number of lobes in a ray (Robbins, 1908). A normal flower head has a large number of ligulate and tubular-shaped rays, with the latter shape being four-lobed. A few flower heads have all tubular rays. The purple, perfect (both stamens and pistil) disk flowers are 7 to 9 millimeters (0.3 to 0.35 inch) in length, with long hairs at the top (Lesica, 2002). The overall appearance of the central disk flowers are said to resemble big, brown eyes, hence the alternative common name, brown-eyed Susan (Talk About Wildlife, 2009). The receptacle is convex to subglobose, with chaffy or sometimes soft, spine-like bristles that do not individually subtend the disk flowers (Hitchcock and Cronquist, 1973). The fruit is a one-seeded, gray-brown achene, 3 to 4 millimeters (0.12 to 0.16 inch) long, with densely ascending hairs, a short pappus crown 7 to 10 millimeter (0.3 to 0.4 inch) long, and awns approximately two times as long as the fruit body (Jepson Manual, 2009). The chromosome number for blanketflower is $2n = 34$ (Taylor and Brockman, 1966).

Method of Selection: Meriwether Germplasm is a composite of 15 accessions that were selected over an evaluation period of 10 years. The composite consists of 14 collections from Montana and a single collection from Wyoming, selected because of their uniformity in flowering, seed maturity, stature, and seed head abundance. Direct increase of G_0 seed (equivalent to Breeders) constitutes the germplasm.

Performance of Blanketflower 1991-2001

Initial Evaluation Plantings: The initial testing of new collections begins with Initial Evaluation Plantings (IEP) at the Bridger PMC. This involves the establishment of single, direct-seeded, or spaced-planted rows in comparison with other collections of the same or similar species. Evaluation factors may include, but are not limited to, subjective ratings of vigor (plant health), forage production (biomass yield per unit area), forage uniformity (evenness of plant height and tiller density), ground cover (percentage basal stem area), seed head abundance (inflorescence production), seed uniformity (homogeneity of seed size—primarily thickness), and measurements of vegetative and seed head height. The long-term average annual precipitation in Bridger, Montana, is 287 millimeters (11.3 inches).

Testing of blanketflower began in the spring of 1991 as part of a larger native wildflower trial. Each accession was planted in individual, 6-meter (16 feet) long rows, spaced 0.9 meter (3 feet) apart. Seeding was done with a single-row, belt seeder. The seedbed was prepared when the clay loam soil was too wet, resulting in a very hard surface horizon. Emergence for most accessions was poor and many entries were

removed in 1992 (USDA-NRCS, 1993). Three accessions of blanketflower performed well enough to be evaluated and the results are reported in Table 1. The collections originated from two counties in Montana: 9058067 and 9058068 (Glacier); and 9058069 (Phillips). The study was conducted under dryland conditions. Annual precipitation in 1991 and 1992 was 355 millimeters (13.96 in.) and 270 millimeters (10.61 inches), respectively.

Table 1. Initial Evaluation Planting. The 1991 performance of three accessions of *Gaillardia aristata* in unreplicated plots at the Bridger PMC.

Accession	Vigor Rating [†]	Forage Production Rating [†]	Forage Uniformity Rating [†]	Ground Cover Rating [†]	Seed Head Abundance Rating [†]	Seed Uniformity Rating [†]
9058067	4	5	4	3	5	5
9058068	2	3	2	2	3	3
9058069	2	3	3	2	3	2

[†] Rated 1-9 with 1 best

Secondary testing began in the spring 1994, as spaced-planted entries of the three previously described accessions, and three additional entries from Montana counties: 9058317 (Glacier), 9063363 (Toole), and 9076004 (Garfield). Evaluation results appear in Table 2, with the accession 9076004 from Garfield County rated highest and the remaining collections mostly average in performance (USDA-NRCS, 1996 and 1998). The study was conducted under dryland conditions. Precipitation totals for 1994, 1995, 1996, and 1997 were 270 millimeters (10.61 inches), 330 millimeters (12.99 inches), 304 millimeters (11.98 inches), and 410 millimeters (16.13 inches), respectively.

Table 2. Initial Evaluation Planting. The 1994-1997 mean performance of *Gaillardia aristata* at the Bridger PMC.

Accession	County Origin	Vigor Rating [†]				Vegetative Height (cm)				Seed Head Abundance Rating		
		1994	1995	1996	1997	1994	1995	1996	1997	1995 [‡]	1996 [‡]	1997 [‡]
		-----				-----				-----		
						cm	cm	cm	cm			
9058067	Glacier	4	6	6	5	5	24	36	21	3	3	5
9058068	Glacier	4	5	6	5	6	28	32	22	3	3	5
9058069	Phillips	3	3	3	3	6	30	37	21	4	2	4
9058317	Glacier	4	3	3	4	7	36	36	19	3	3	4
9063363	Toole	5	6	2	2	4	30	26	6	3	5	2
9076004	Garfield	1	3	2	1	6	33	37	16	3	1	1

[†] Rated 1-9 with 1 best

[‡] Rated 1-4 with 1 best

Final testing began as a dormant field planting in the fall of 1997 with 15 accessions of blanketflower included as part of a larger, miscellaneous forb trial. Included were five of the six previously tested entries from the Montana counties of Garfield, Glacier, Phillips, and Toole (9058317 was excluded due to poor performance); plus eight new collections from the following Montana counties: 9063525 (Stillwater); 9076281 (Madison); 9078282 (Rosebud); 9076247, 9078283, 9078284, 9078285, and 9078444 (Park); and 9078421 (Garfield); and 9078422 from Washakie County, Wyoming. Plot layout and design facilitated cross-pollination among accessions.

All of the entries established during the first growing season (Table 3). Overall plant establishment increased over the course of the study, despite slight declines in seed head height and abundance. Time of flowering among accessions was fairly consistent and ranged from late May to early June. Seed collected on July 23, 2001, from all the entries was bulked as accession 9081828 (USDA-NRCS, 2000 and 2002). The study was conducted under dryland conditions. Precipitation totals for 1998, 1999, 2000, and 2001 were 288 millimeters (10.94 inches), 201 millimeters (7.93 inches), 268 millimeters (10.54 inches), and 235 millimeters (9.26 inches), respectively.

Table 3. Initial Evaluation Planting. The 1998-2001 performance of *Gaillardia aristata* in un-replicated plots at the Bridger PMC.

Accession	Vigor Rating [†]				Plant Height (cm)				Seed Head Abundance Rating [†]		
	1998	1999	2000	2001	1998 [‡]	1999 [§]	2000 [§]	2001 [§]	1999	2000	2001
					<i>cm</i>	<i>cm</i>	<i>cm</i>	<i>cm</i>			
9058067	4	2	1	2	12	50	58	36	3	1	2
9058068	5	2	2	4	11	53	67	40	3	2	4
9058069	4	3	2	5	11	43	40	24	2	2	4
9063363	6	4	3	3	14	35	43	28	4	2	3
9063525	6	2	5	5	12	50	31	30	2	5	5
9076004	3	1	2	5	15	48	42	27	1	2	6
9076247	4	2	3	3	16	57	44	35	2	2	3
9078281	5	3	4	6	14	39	41	30	3	2	5
9078282	6	5	5	5	13	50	48	30	5	4	5
9078283	7	5	2	5	10	40	52	30	5	3	5
9078284	4	4	4	7	15	39	40	30	4	4	5
9078285	5	4	5	6	8	40	41	29	4	6	6
9078421	6	5	3	6	13	35	50	32	5	2	5
9078422	7	6	5	5	15	32	38	35	6	5	5
9078444	5	2	2	5	12	39	43	35	2	2	5

[†] Rated 1-9 with 1 best

[‡] Vegetative height

[§] Seed head height.

Other trials: Meriwether Germplasm was used in five trials from 2002 through 2008 to test the effects of herbicide applications to control broadleaf weeds in seed production fields of native wildflowers. The blanketflower had very good establishment in all of the studies and tolerated some of the chemicals used to control target weeds. Preliminary results indicate effective weed control with the use of pendimethalin and a mix of pendimethalin and trifluralin (Wiese, 2009). The research does not recommend use of any tested herbicides not specifically labeled to control broadleaf weeds in wildflower seed production fields.

The testing of this accession has been limited to the Bridger Plant Materials Center in south-central Montana and southwestern Montana near Bozeman.

Insect or Disease Problems: Blanketflower has no serious insect or disease problems. Root rot may be a problem in poorly-drained soils, especially during extended periods of heavy rain. Powdery mildew may be present at times of elevated humidity, but usually does not have a long-term negative impact on the plants. The species generally is susceptible to aster yellows and fungal leaf spot disease (Missouri Botanical Garden, 2009). *Gaillardia* is slightly susceptible to oat blue dwarf virus (Brunt et al., 1996).

Blanketflower is not known to be a host of viral or fungal diseases affecting economic crops in the United States (Lapierre, 2004). It has, however, been identified as a host for the Cucumber Mosaic virus in Europe (Valiunas et al., 2008).

Ecological and Environmental Considerations: There is an increasing demand for high quality, native forbs to compete against undesirable weeds and invasive plants, and to facilitate ecological structure and function in restored sites across Canada and the United States (Native Plant Working Group, 2000). The successful establishment of diverse plant communities relies, in part, on the use of adapted plant materials capable of surviving the harsh environmental conditions typical of most reclamation project sites (Morgan et al., 1995). The extensive distribution, relative abundance, and quick establishment of blanketflower make it a valuable candidate for providing species diversity in seed mixes for the revegetation of disturbed lands (Bjugstad and Whitman, 1989). Blanketflower lends itself to agronomic seeding methods when planted at the appropriate time and rate (Norcini, 2006).

As global demand increases for drinking and irrigation water, there is concern over the excessive use of high water-consuming plants in residential and commercial landscapes (Proctor, 1996). Blanketflower is an attractive, showy, native wildflower that is tolerant of drought conditions within its range of adaptation (Curtis and Curtis, 1989). It is recommended for use as an ornamental specimen plant or a mass display in low watering zones of Xeriscape™ and waterwise gardens (Knopf, 1991). It may be irrigated using non-potable water with salinity levels up to 5.4 decisiemens per meter with minimal impact to the visual aesthetics of the plant (Niu et al., 2007). Blanketflower is considered deer-resistant due to the mature plant's unpalatable and rough-textured stems and leaves (Parkinson, 2003). Whitetail deer may lightly browse blanketflower to supplement dietary needs at different times of the year (Atwood, 1941). Low volatility of the leaf chemistry combined with high moisture content suggests blanketflower is less flammable and more resistant to wildfire (Dennis, 2008). Percentage canopy cover of blanketflower more than doubled following a wildfire (Antos et al., 1983). This species attracts butterflies, moths, songbirds, and a variety of pollinating insects (Applewood Seed Company, 2009). More than 30 hybrid varieties of several species of blanketflower have been developed for use in the commercial floriculture industry with the majority having landscape application in the southern regions of the United States. (Hammond, 2007).

A wide variety of pollinators and beneficial insects rely on blanketflower as a food source of pollen and nectar, and for resting and cover. It is a common nectar source for the adult stage of the butterfly, Edwards fritillary *Speyeria edwards* (Opler, 2008). A cryptic moth, *Schinia masoni*, is color-camouflaged to mimic the yellow ray flowers and purplish-brown disk flowers of blanketflower as protection against predators (Ferner, 1981). Blanketflower is an indicator plant associated with the upland, dry prairie habitats of the Dakota skipper *Hesperia dacotae* Skinner (Cochrane and Delphey, 2002), a butterfly species petitioned as a candidate for listing under the Endangered Species Act (USDI-USFWS, 2008). In western North America, the widely distributed soft-winged flower beetle *Listrus senilis*, is recognized as a crucial pollinator of blanketflower (Mawdsley, 2003). Blanketflower is a component of several northern grassland ecosystems where the breakdown of organic matter by functionally-important insects increased soil fertility and improved soil water-holding capacity and water infiltration. (Hewitt and Burleson, 1976).

Indian tribes of North America long recognized the medicinal qualities of blanketflower and used it to treat many ailments (University of Michigan, 2003). The Blackfeet used infusions of roots and leaves to relieve upset stomachs and to treat saddle sores on horses (Larson and Johnson, 1999). Kiowas picked the flowers for good luck (Johnson and Larson, 1999). Blanketflower was one of the voucher specimens collected by Captain Meriwether Lewis along the Blackfoot River on July 7, 1806 (Phillips, 2003). Cancer studies on major plant groups determined blanketflower contained the sesquiterpene lactone agent, gaillardin, a tumor-killing (antineoplastic) compound (Lewis and Elvin-Lewis, 1977). There is evidence blanketflower contains substances with antibacterial properties (Harris, 1949). A skin rash or irritation may develop following contact with juice or sap from the foliage (Ferner, 1981).

The tender, young plant growth and insect-rich blooms of blanketflower are a potential food source for young and adult upland game birds, such as sage-grouse and sharp-tail grouse. Forage palatability of blanketflower is rated poor to fair for domestic livestock during early stages of growth. It is a mid-summer maturing species in sagebrush plant communities (Pitt and Wikeem, 1990). Blanketflower can be an indicator of range readiness, as it will begin to bloom when more desirable forage plants have reached the stage of growth where they are ready for grazing (WACD, 1987). Blanketflower was a highly selected forb by California bighorn sheep and comprised 2 percent of late-summer diet (Wikeem and Pitt, 1979). Gayton (2003) indicated grazing regime or local site conditions greatly influence re-growth in blanketflower. Its response to grazing and other disturbances can be indicators of successional trend and ecological integrity (USDA-FS, 1983). Light grazing by domestic sheep did not noticeably affect the abundance of plants (Daubenmire, 1970). Tyrer et al., (2007) suggests early germination and establishment, and resistance to allelopathic chemicals, give *Gaillardia aristata* seedlings a considerable advantage over later germinating Russian knapweed (a noxious weed) seedlings. Callaway et al., (2004) found the biomass of spotted knapweed (another noxious weed) was lower when grown in competition with *Gaillardia aristata*. Plant communities rich in perennial forb species such as blanketflower, may be more resistant to noxious weed invasion (Maron and Marler, 2007) and indigenous, deep-rooted, forb functional groups (of which *Gaillardia* is a member) capture soil moisture and nutrients making them less available for weed establishment (Pokorny, 2005).

Seed Increase: Experimental seed production of Meriwether Germplasm (9081828) at the BPMC yielded approximately 168 kilograms per hectare (150 pounds per acre) on an average harvest date of July 29. Seed production is anticipated to be much higher under normal irrigated, agronomic conditions. Meriwether Germplasm has approximately 486 seeds per gram (220,700 seeds per pound). There are 5 seeds per square foot at 1 pound pure live seed per acre; approximately equivalent to a full seeding rate for a 24-inch row spacing of 2.5 pounds pure live seed per acre (25 seeds per row-foot).

No other northern adapted conservation release of native blanketflower is currently available to the commercial seed industry. There is a commercial shortage of native forb seed for use in re-vegetating disturbed areas and re-establishing native plant communities in conservation enhancement and wildlife habitat improvement programs. Currently, the majority of available seed of this species comes primarily from harvest of native wildland sources.

Anticipated Conservation Use: Meriwether Germplasm was selected primarily for adding species diversity to native plant seed mixes in the rehabilitation of disturbed sites, such as rangelands, mine lands, roadsides, park and recreation areas, prairie restoration projects, and conservation plantings in accordance with government farm bill program requirements. Blanketflower is suitable for use as an ornamental wildflower in low maintenance or naturalistic landscapes such as private residences, apartment complexes, and commercial businesses (USDA-NRCS, 2001). Blanketflower may have application in the production of native wildflower sod for restoration of natural plant colonies (Airhart, 1988). It has utility as a food source for pollinators, wildlife, and livestock.

Anticipated Area of Adaptation: Blanketflower is expected to perform well in areas depicted in Figure 1. Its native range extends from south-central Canada to southern Colorado, east to the Dakotas and west to the Cascade Mountains of Washington and the Blue Mountains of Oregon (Marlowe and Hufford, 2007). In Montana, presence of blanketflower has been documented in all 56 counties (Booth and Wright, 1959), including nine types of riparian plant communities (Hansen et al., 1995). It is an important component of several habitat types in western Montana (USDA-FS, 1966). Blanketflower is present in the mountain and foothill environments of more than half of the 23 counties in Wyoming (Rocky Mountain Herbarium, 2009). It does well on a variety of soil types, including loams to rocky to gravelly-sandy textures; and tolerates a soil pH range from slightly acidic to mildly alkaline (USDA-NRCS, 2003). Blanketflower attains optimum growth in full sun, beginning in early spring until seed set in late summer (USDA-FS, 1980). It occurs at elevations from 400 to 2,743 meters (1,300 to 9,000 feet.).

Increase and Distribution: The USDA-NRCS Plant Materials Center in Bridger, Montana, maintains G₁ seed (equivalent to Foundation seed) and is available to commercial growers through the Montana Foundation Seed Program at Montana State University-Bozeman and the University of Wyoming Foundation Seed Service at Powell, Wyoming. Two generations (G₂ and G₃ equivalent to Certified) beyond G₁ are recognized. G₁ stock will be available in 2012.

Submitted by: This release notice of Meriwether Germplasm blanketflower was prepared and submitted by Susan R. Winslow, USDA NRCS, for joint release by the USDA NRCS and the Montana and Wyoming Agricultural Experiment Stations, July 2011.

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Appendix Table 1. Collection site information of 15 accessions comprising Meriwether Germplasm blanketflower (accession 9081828).

Accession	County	Location	Physical Environment	Date	NRCS Collector
9058067	Glacier, MT	T34N R12W S21	Silty soil, 2% slope, north aspect, 406 mm ppt	8-14-89	Sam Short, Great Falls
9058068	Glacier, MT	T33N R13W S9	Silty soil, 15% slope, west aspect, elev 1,676 m, 508 mm ppt	8-13-89	Sam Short, Great Falls
9058069	Phillips, MT	T32N R29E S26	1% south facing slope, 279 mm ppt	8-22-89	Alan McNeal, Malta
9063363	Toole, MT	T36N R3E S8	Zohill-Zohl loamy soil, 12% slope, south aspect, elev 1,396 m, 381 mm ppt	9-9-91	Matt Crampton, Chinook
9063525	Stillwater, MT	T35N R20E S11	Hilger-Castner soil, cobbly sandy loam texture, 20% slope, east aspect, elev 1,118 m, 254 to 356 mm ppt	7-25-92	Geri Sullivan, Livingston
9076004	Garfield, MT	T20N R33E S5	Kremlin loamy soil, 7% slope, east aspect, elev 1,021 m, 381 to 483 mm ppt	7-28-93	John Monahan, Jordan
9076247	Park, MT	T25N R8E S16	Ridgetop, 2-8% slope, elev 1,585 m, 381 mm ppt	9-17-94	Geri Sullivan, Livingston
9078281	Madison, MT	T3S R1E S30	Oro Fino-Poin Complex soil, gravelly loam texture, 5% slope, east aspect, elev 1,561 m, 254 to 356 mm ppt	8-8-95	Susan R. Winslow and Matt Marsh, Bridger PMC
9078282	Rosebud, MT	T2S R39E S18	42% north slope, 381 to 483 mm ppt	7-28-95	Carla Lawrence, Hal Hunter, Pete Husby, Circle and Bozeman

Appendix Table 1. *Gaillardia aristata* accession information - Continued.

Accession	County	Location	Physical Environment	Date	NRCS Collectors
9078283	Park, MT	T1N R11E S20	Cabba-Regent-Tolman soil, silty clay loam texture, 2% slope, elev 1,573 m, 254 to 356 mm ppt	8-23-95	Robin Fuson and Geri Sullivan, Livingston
9078284	Park, MT	T2S R11E S29	Rocky, loamy-sand soil texture, 35% slope, west aspect, elev 1,665 m, 381 to 483 mm ppt	8-23-95	Robin Fuson and Geri Sullivan, Livingston
9078285	Park, MT	T1N R11E S28	Cabba-Regent-Tolman soil, silty clay loam texture, 20% slope, south aspect, elev 1,615 m, 254 to 356 mm ppt	8-23-95	Geri Sullivan, Livingston
9078421	Garfield, MT	T21N R33E S31	Sabby clay loam soil, 3% slope, north aspect, elev 975 m, 330 mm ppt	8-26-96	John Monahan, Jordan
9078422	Washakie, WY	T42N R86W S27	Boinette loam soil, 8% slope, east aspect, elev 2,469 m, 381 to 483 mm ppt	9-17-96	S. Myers, Worland
9078444	Park, MT	T4N R8E S17	Regent-Wilsall-Tolman soil, clay loam texture, 20% slope, south aspect, elev 1,689 m, 254 to 356 mm ppt	9-12-96	Geri Sullivan, Livingston

Signatures for release of:

Meriwether Germplasm Blanketflower *Gaillardia aristata*

Joyce Swartzendruber
State Conservationist
NRCS
Bozeman, Montana

Date

J. Xavier Montoya
State Conservationist
NRCS
Casper, Wyoming

Date

Director
Montana Agricultural Experiment Station
Montana State University
Bozeman, Montana

Date

Director
Wyoming Agricultural Experiment Station
University of Wyoming
Laramie, Wyoming

Date

Director
Ecological Sciences Division
NRCS
Washington, DC

Date

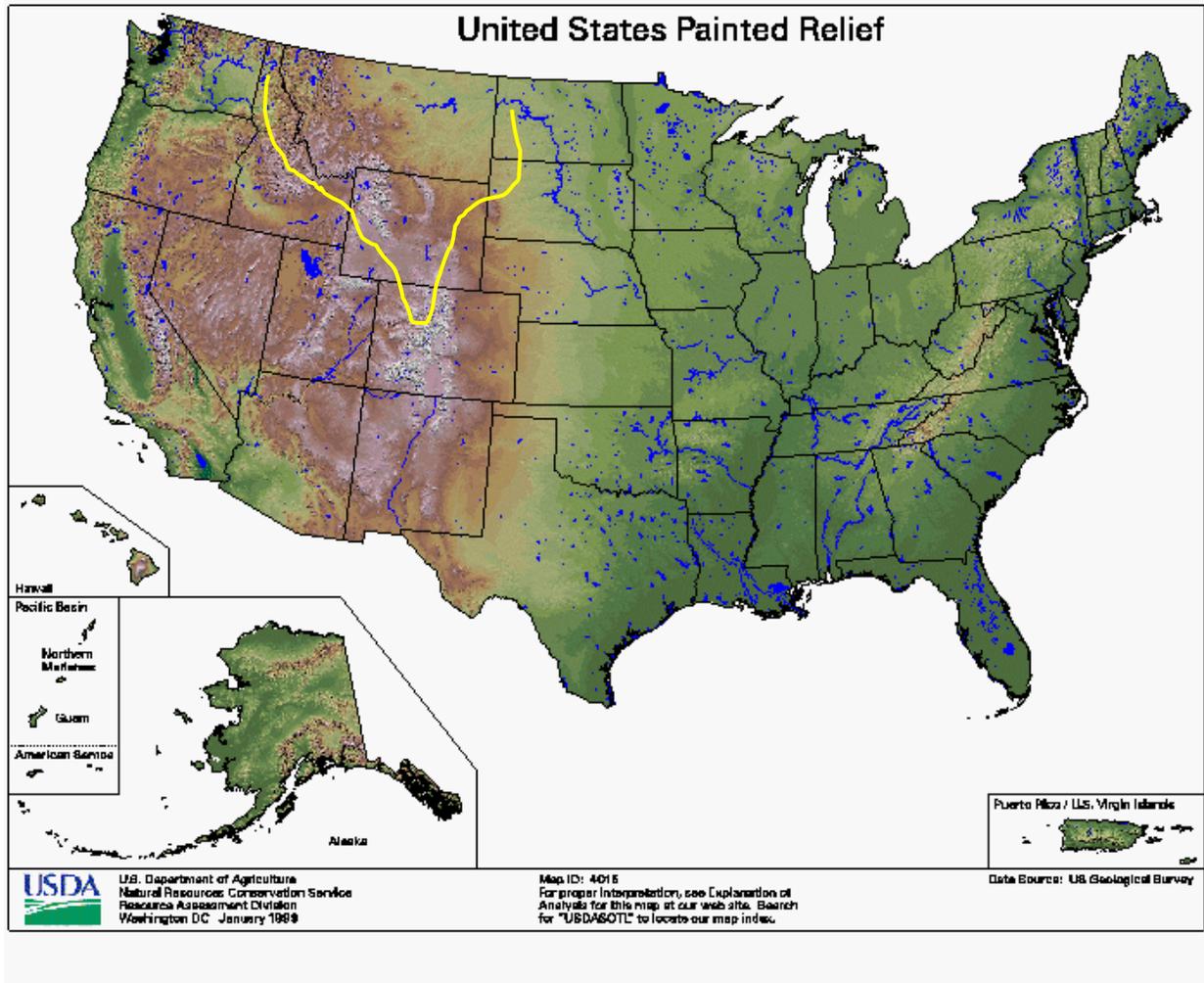


Figure 1. Anticipated area of adaptation of Meriwether Germplasm blanketflower.