United States Department of Agriculture

Natural Resources Conservation Service Plant Guide

BLANKETFLOWER

Gaillardia aristata Pursh

Plant Symbol = GAAR

Alternative Names
Common Names: Indian blanketflower, common gaillardia, gaillardia, brown-eyed Susan, Arizona Sun, fire wheel, spring salmon's eye

Figure 1. Blanketflower. USDA-NRCS Bridger Plant Materials Center (June 2023).

Description
General: Blanketflower is a herbaceous perennial forb in the Asteraceae family. It has a taproot, with a minimum depth of 16 inches, and one to several erect stems emerging from the base (Hitchcock et al., 1955; Mee et al., 2003). The pubescent plant grows to a height of 26 inches. It has rough, hairy, lance shaped alternate leaves about 6 inches long and 1 inch wide (USDA-USFS, 1966). Flower heads are solitary at the end of long stalks and have an outer series of sterile ray flowers and an inner series of bisexual disk flowers (Lesica, 2002). Ray flowers are yellow or yellow and red/purple (eFloras, 2023). The number of ray flowers is variable, as is the number of lobes in a ray (Robbins, 1908). Petals are usually 0.6 to 1.4 inches long and lingulate. The receptacle has spinelike bristles and is convex to subglobose, the bristles do not individually subtend the disk flowers (Hitchcock & Cronquist, 1973). The fruit is one seeded, gray brown in color, 0.12 to 0.16 inch long with densely ascending hairs, a short pappus crown 0.3 to 0.4 inch long, and awns approximately twice as long as the fruit body (Keil, 2012). The chromosome number for blanketflower is $2n = 34$ (Taylor & Brockman, 1966).

Distribution: The native range of blanketflower extends from south central Canada to the northern third of the United States. In addition, it is found in California, Utah, Arizona, and New Mexico (Marlowe & Hufford, 2007; Consortium of Pacific Northwest Herbarium, 2023; Rocky Mountain Herbarium, 2023; USDA-NRCS, 2023). Blanketflower was collected by Captain Meriwether Lewis in 1806 near Lewis & Clark Pass in the Helena National Forest (Montana Native Plant Society, 2023). For current distribution, consult the Plant Profile page for this species on the PLANTS Website (http://plants.usda.gov/).

Habitat: Blanketflower grows on sunny, well drained sites in prairie meadows and semi-open brush mixed with trees. It is frequently found on dry, south facing slopes with little moisture (Rocky Mountain Herbarium, 2023). Blanketflower grows at elevations from 1,300 to 9,000 feet and can be found along roadsides, rocky slopes, and ridgetops (Consortium of Pacific Northwest Herbarium, 2023). Blanketflower has a long bloom period beginning in early spring through seed ripening in late summer. It is a mid-summer maturing species in sagebrush communities (Pitt & Wikeem, 1990).

Adaptation
Blanketflower is adapted to a wide range of well drained soils and is drought tolerant (Mee et al., 2003; USDA-NRCS, 2012). It grows best on dry to mesic, well drained sites and areas with 5 to 35 inches of annual precipitation (PRISM Climate Group, 2022; Rocky Mountain Herbarium, 2023). Seed ripening is correlated with precipitation from May to June, with delays in maturation when precipitation is greater than average (Mueggler, 1983). Blanketflower tolerates soil pH ranges from slightly acidic to mildly alkaline (Winslow, 2011). In Montana, blanketflower was documented in all 56 counties (Booth & Wright, 1959), and in nine types of riparian plant communities (Hansen et al., 1995). It is also found in mountain and foothill environments in 12 of 23

Wyoming counties (Rocky Mountain Herbarium, 2023). Blanketflower is considered a mid-successional species and can grow on disturbed sites and in dense populations (Taylor, 1992). It competes well with noxious weeds, capturing soil moisture and nutrients making them less available for weed establishment (Pokorny et al., 2005; Maron & Marler, 2007). It may have low (2 to 4 dS/m) soil salinity tolerance depending on site conditions (Niu et al., 2007). Blanketflower can be cultivated in sandy soil with irrigation water salinity levels up to 10 dS/m, though flower production decreases as salinity increases (Rao & Shahid, 2011). Blanketflower has a high moisture content and low volatility of leaf chemistry suggesting that it may be resistant to wildfire (Dennis, 2008). After a wildfire in western Montana, the percentage of blanketflower canopy cover more than doubled (Antos et al., 1983).

Figure 2. Blanketflower full plant, USDA-NRCS Bridger Plant Materials Center (June 2020).

Uses

Blanketflower is used to increase species diversity in native plant seed mixes for disturbed site rehabilitation (Winslow, 2011). It is suitable as an ornamental wildflower in low maintenance or natural landscapes (USDA-NRCS, 2001) and its drought tolerance makes it a good candidate for waterwise gardens and low watering zones (Mee et al., 2003). Blanketflower can be used to produce native wildflower sod for restoration due its solid root density and stability (Johnson & Whitwell, 1997). There are more than 30 hybrid varieties of several species of blanketflower that have been developed for the commercial floriculture industry (Hammond et al., 2007).

Blanketflower can be used as vegetative cover and a food source for pollinators, wildlife, and livestock. It has a high pollinator visitation rate and attracts bee species, supports specialist bee species, and blooms for extended periods across its range (Glenny et al., 2022). It is a common nectar source for the adult stage of the Edwards fritillary butterfly (Opler & Cranshaw, 2008). The cryptic moth is patterned to camouflage itself to appear like the blossoms of blanketflower when feeding or resting while the larval stages feed on the flowers and developing seeds (Byers, 1989). Blanketflower is an indicator plant associated with the upland, dry prairie habitats of the Dakota skipper (Cochrane & Delphey, 2002), a butterfly species listed as threatened under the Endangered Species Act in 2014 (USFWS, 2023). In western North America, the widely distributed soft winged flower beetle is recognized as a crucial pollinator of blanketflower (Mawdsley, 2003).

Blanketflower is an important component of northern grassland ecosystems (Hewitt & Burleson, 1976). It is the most preferred forb in late summer for California bighorn sheep making up 2% of their diet in August (Wikeem & Pitt, 1979). Blanketflower has a mixed response to grazing dependent on grazing regime and local site condition (Gayton, 2003). It is more likely to be grazed early in the blooming season (Hermann, 1966). Blanketflower's palatability is fair for sheep and deer and fair to poor for cattle and elk (Mueggler & Stewart, 1980, Ehlert et al., 2022). Whitetail deer may lightly browse blanketflower seasonally to supplement dietary needs (Atwood, 1941).

Ethnobotany

Blanketflower is used by many indigenous people for food and medicine. Nlaka'pamux, whose traditional territory spans what is now known as the Canadian province of British Columbia, use blanketflower as a tuberculosis remedy, treatment for cancer, pain reliever, and miscellaneous disease remedy (Turner et al., 1990). The term 'cancer' in ethnobotanical text may refer to a variety of conditions, this may or may not include the current usage of the word. The Syilx (Okanagan and Colville), traditionally located along the Canada U.S. border in Washington state and British Columbia, use blanketflower for kidney, orthopedic, venereal aids, and as an analgesic (Turner et al., 1980). The Havasupai people, who live in the Grand Canyon in Northwest Arizona, use blanketflower as food. The seeds are parched, ground, and kneaded into seed butter (Weber & Seaman, 1985). Among the Niitsitapi (Blackfeet Nation) whose traditional territory spans much of Alberta, from the north Saskatchewan River, down along the Eastern Rocky Mountains, and Só'taétaneo'o and Tsétsêhéstâhese (Cheyenne) of the Great Plains, blanketflower roots were used for gastroenteritis, saddle sore treatment, eyewash

for horses, skin disorders, and more (Johnson & Larson, 1999). Flower heads were eaten and are used in soups and broths by the Niitsitapi (Savage, 2019). The Kiowa or Ka'igwu of the Great Plains, pick the flowers for good luck (Johnson & Larson, 1999). Flowers have been used for foot washes and treating sunstroke (Savage, 2019). Blanketflower roots can reportedly be chewed as an anesthetic (Lewis, 1997).

Status

Threatened or Endangered: Blanketflower is not a threatened or endangered species.

Wetland Indicator: None.

Weedy or Invasive: This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (http://plants.usda.gov/) and your state's Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Figure 3. Field of blanketflower, USDA-NRCS Bridger Plant Materials Center (June 2023).

Planting Guidelines

Blanketflower may be grown from seed or by dividing vegetative parts. Seed does not require cold stratification treatment to break dormancy. For range plantings, plant seed into a firm, weed free seedbed, preferably with a mechanical drill that will ensure uniform seed placement depth of ¼ to ½ inch (Winslow, 2002). There are 186,000 seeds in one pound. The full seeding rate is 6 pounds pure live seed (PLS) per acre (USDA-NRCS, 2013). It is recommended that blanketflower be included as a component of a native seed mix at a rate not to exceed ½ to 1-pound PLS per acre. Spring seeding is preferred over late summer or dormant, fall planting dates.

Management

Blanketflower is drought tolerant and requires supplemental moisture only during extended hot, dry conditions (Niu et al., 2007). Periodic mowing during the establishment year is an option for weed suppression. If using chemical weed control, preemergence herbicides are most effective (Norcini, 2006). Blanketflower had mixed responses to herbicides, such as bloom delays and less flower growth; caution should be used if applying herbicide on a mix of wildflowers with blanketflower (Wiese, 2009). Integrated weed management programs of mowing, manual weeding, and chemical weed control is effective for blanketflower establishment (Norcini, 2006; Wiese, 2009). Early germination and establishment, and resistance to allelopathic chemicals, give blanketflower seedlings a considerable advantage over the later germinating seedlings of Russian knapweed (*Acroptilon repens),* (Tyrer et al., 2007). Spotted knapweed (*Centaurea stoebe* ssp. *Micranthos)* biomass was lower when grown in competition with blanketflower (Callaway et al., 2004).

Pests and Potential Problems

Blanketflower has no serious insect or disease problems but is susceptible to smuts and fungal leaf spot disease (Namita et al., 2020; Missouri Botanical Garden, 2023). It is slightly susceptible to oat blue dwarf virus (Brunt et al., 1996). 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 and can stunt the plant (Namita et al., 2020). Blanketflower is affected by Cucumber mosaic virus (CMV) transmitted by aphid vectors worldwide (Sastry et al., 2019). Plants infected with CMV are stunted, have distorted petals, and show mosaic symptoms on leaves and flowers (Sastry et al., 2019). *Alternaria alternata* and *Botrytis cinerea* are foliar pathogens and can be controlled with commercially available fungicides and/or antifungal antibiotics (Namita et al., 2020). Seed borne fungi *Allernaria allernata, Botrytis cinerea, Curvularia pallescens,* species of *Drechslera, fusarium* and *Aspergillus* induce varying degrees of seed and seedling mortality (Namita et al., 2020).

Environmental Concerns
Blanketflower is relatively long lived and may re-seed in abundance creating conditions where it may become weedy or invasive displacing desirable vegetation if not properly managed. Blanketflower may irritate skin (Perry, 1997).

Seeds and Plant Production
Blanketflower lends itself to agronomic seeding methods when planted at the appropriate time and rate (Norcini, 2006). Seeds should be planted in the spring after frost risk. Establish seed production fields in rows with 26 PLS per linear foot (USDA-NRCS, 2013). Between-row spacing is dependent on the type of planting and cultivation equipment, and ranges from 24 to 36 inches. At 24-inch row spacing, the recommended seeding rate is 2.5 pounds PLS per acre, and at 30- and 36-inch row spacing, the seeding rate is 2.2 and 1.9 pounds PLS per acre, respectively. There are presently no herbicides specifically labeled to control weeds in seed production fields of this species. However, effective weed control with the use of pendimethalin and a mix of pendimethalin and trifluralin herbicides were effective in Bozeman and Bridger, Montana (Wiese, 2009).

Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA, NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

When blanketflower seeds are ready for harvest the mature seed head resembles a light gray fuzzy ball (Norcini, 2006). Hand harvesting with pruning shears is the most selective method of harvesting and maximizes yield but is more labor intensive (Norcini et al., 2002). Seed harvest can also be accomplished by direct combining when the seeds have begun to shatter from the flowerhead. Immediately after harvesting, spread out seed to dry and prevent mold. After drying, seed can be threshed with a hammermill through an $^{8}/_{64}$-inch round hole screen, air-screen processed on a Clipper M2B over a $^{10}/_{64}$ or $^{12}/_{64}$ inch round hole screen with moderate wind (Winslow, 2002). Due to the persistent hairy pappus and poor seed flow, this species is moderately difficult to clean.

Cultivars, Improved, and Selected Materials (and area of origin)
Meriwether Germplasm Selected Class blanketflower was released in 2011 by the Bridger Plant Materials Center in cooperation with the agricultural experiment stations of Montana State University and the University of Wyoming. Meriwether Germplasm is a composite from 14 Montana collections and one collection in Wyoming (Winslow, 2011).

Cultivars should be selected based on the local climate, resistance to local pests, and intended use. Consult with your local land grant university, local county Extension office, or local USDA NRCS office for recommendations on adapted cultivars for use in your area**.**

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