USDA
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Natural Resources Conservation Service Plant Guide

DESERT MARIGOLD

Baileya multiradiata Harv. & A. Gray ex A. Gray

Plant Symbol = BAMU

Common Names: desert baileya, wild marigold, paper daisy, showy desert marigold, hierba amarilla

Scientific Names: Baileya thurberi, Baileya multiradiata var. *nudicaulis, Baileya australis, Baileya multiradiata* var. *thurberi*

Figure 1. Desert marigold (Photo by Jim Thomas, USDA-NRCS Tucson Plant Materials Center).

Description

General: Desert marigold is a native, biennial, or short-lived perennial forb. It is 0.63 to 1.71 ft (19 to 52 cm) in height, spreading 4 to 12 in (10 to 30 cm) in width, with long-stalked heads of bright yellow flowers, often fading with age. Leaves are 0.32 to 3.94 in (0.8 to 10 cm) long and 0.40 to 1.97 in (1 to 5 cm) wide, clustered at the base, compound, grayish green in color, and covered by soft, white hairs. Petioles are 0.40 to 1.58 in (1 to 4 cm) long. Blades are pinnately lobed to entire and ovate to linear in shape. The inflorescence consists of solitary yellow flowerheads. The flower stalk is 3.94 to 12.60 in (10 to 32 cm) long during anthesis. The ring of bracts is 0.20 to 0.40 in (5 to 10 mm) high and 0.40 to 1.03 in (10 to 26 mm) wide, densely hairy, and hemispheric in shape. Petals contain approximately 25 to 40 ray florets that are 0.44 to 0.87 in (11 to 22 mm) long, and yellow in color with pubescent corollas. The quantity of disk florets varies and is dependent on plant size but can be between 25 to 50 and reach hundreds. Desert marigold may intermittently bloom from March to November but can do so year-round since it has a long blooming period if conditions are favorable. Its sturdiness is attributed to the leaves, stems, and flower stalks, which are covered by small white hairs that help the plant retain moisture (Welsh et al., 1987; Turner, 1993; Britton, 1914; Bryant, 2011; USDA, 1917). Named after Jacob Whitman Bailey, an early American botanist and microscopist, the species 'multiradiata' translates as "many-rayed", indicating the prominent yellow flowers (Earle, 1974). Desert marigold is sometimes called "paper-daisy" since the petals turn pale and papery as they age, although it should not be confused with other species that sometimes carry the same name (Martin, 1988; Van Dyke Leake et al., 1993). It is commonly confused with "woolly desert marigold" (*Baileya pleniradiata)* (containing similar number of ray florets), and less commonly with "Colorado desert marigold" or "laxflower" (*Baileya pauciradiata)* (containing less than 10 ray florets); both contain leafy stems instead of woody (Jaeger, 1941; Rowntree, 1942). Desert marigold has by far the greatest attributes from the three species, including its tolerance, abundance, widest range of adaptation, attractive blooms, and flowering season.

Distribution: Desert marigold is found throughout the southwestern United States, and in northwestern Mexico in the Mojave, Sonoran and Chihuahuan deserts. It is primarily and commonly present in Arizona, from Western Texas to southern Utah, southeastern California, and southern Nevada (Kearney and Peebles, 1942; Enciclovida, 2022). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Among rocky slopes, washes, roadsides (Warren et al., 1992), sandy plains and mesas, low hills of different desert ecosystems (Haskell et al., 1925) and in the semidesert grassland and shrub areas (Sperry, 1956). Common at altitudes up to 5,000 ft (1,524 m) (Kearney & Peebles, 1942), but present from 328 ft (100 m) up to 6,500 ft (1,981 m) (Turner, 1993; Martin, 1988; Enciclovida, 2022).

Adaptation

Desert marigold is adapted to sandy or gravelly alkaline soils but will survive in other soil types with good drainage (Irish, 2006; Hodoba, 1995). It is adapted to disturbed soils, especially common alongside roadways, where it benefits from water runoff. Desert marigold is a drought and cold tolerant forb that thrives in a variety of soils, including poor and dry soils, gravelly, caliche, clay, sandy and loamy soils with good drainage (Mielke, 1959; Perry, 1992).

Figure 2. Desert marigold (Photo by Jim Thomas, USDA-NRCS Tucson Plant Materials Center).

Uses

The potential uses of desert marigold include pollinator habitat establishment, wildlife cover, erosion control, disturbed area restoration and rangeland rehabilitation. Its disturbance adaptation is attributed to the potential of rapid seedling emergence and establishment (Bauer et al., 2009). Desert marigold has been historically cultivated for the flower trade in California while holding a special and important value to the desert ecosystem (Kearney & Peebles, 1942). Native bees are attracted by large numbers, especially during the monsoon season (Hodoba, 1995), due to its usually erect flowers and pleasantly sweet floral aroma (Brenner, 2005). Its nectar rich flowers attract butterflies such as the Leanira Checkerspot and the Desert and Pima Orangetips. Its seeds attract a variety of birds, small mammals, reptiles, and insects. The black-throated sparrow feeds on the pale tan seeds during the fall (Williams, 2011). Its foliage is a potential forage option with high values of mineral and nutritional parameters, attracting rabbits and the desert tortoise (McArthur et al., 1994; Esque et al., 1990). The desert grassland whiptail lizard can also be found sheltering beneath the foliage (Knopf et al., 2003). It is reportedly toxic to sheep and goats in both wet and dry state, although mammals appear not to eat it under range conditions unless forage is lacking (Mathews, 1933). Desert marigold's primary toxins are hymenoxon and sesquiterpene lactones, which can cause eye, nose, and gastrointestinal irritation (Knight & Walter, 2001; Turner, 1993). Desert marigold has potential medicinal uses due to the presence of antineoplastic agents, which are used in medications to treat cancer for their antitumor activities (Roberts, 1978).

Ethnobotany

Desert marigold has been used by Native American tribes for multiple purposes. The Jemez Tribe used it for the creation of adobe, a building material including earth and organic materials, by mixing the plant with clay (Cook, 1930). The Keres Tribe used it as deodorant by rubbing the plant materials under their arms and named it "Trutsa, Trusa" (Swank, 1932).

Status

Threatened or Endangered: No.
Wetland indicator: No.
Weedy or Invasive: No.

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).

Planting Guidelines

The recommended seeding rate for desert marigold is 0.5 to 2 pounds (lb) of pure live seed (PLS) per acre if planted with a drill, and approximately 1 to 4 PLS lb per acre if the seed is broadcasted (Bauer, 2009; Johnson, 1993). The seeding rate should be adjusted accordingly when used as a part of a mix. There are approximately 1,060,000 seeds per lb (Johnson, 1993; Granite Seed, 2022). Desert marigold seed is not physiologically dormant but may require cold or moist stratification for germination (Art, 1986; Lady Bird Johnson Wildflower Center, 2021).

Management

Desert marigold is frost, drought, and heat resistant, although flowering and foliage production will stop during severe drought and hard frost. It can be watered intermittently throughout the seasons to keep plants vigorously blooming, if dry conditions arise, or to establish a planting. Avoid overwatering since it is sensitive to crown rot if the soil is too wet, and it may die if overwatered. Plants are self-sown and are often found in clusters but are not intrusive/invasive in nature (Irish, 2006; Bryant, 2011; Earle, 1974; Shuler, 1993).

Pests and Potential Problems

Desert marigold is host to the desert marigold moth, which uses the flower's heads to lay its larvae, by sealing the florets shut into a ball. The moth is light brownish to yellow in color with broad pale lines and can be up to 0.48 in (12 mm) in length. Its range is from Nevada to Colorado and southern California to western Texas (Powell & Opler, 2009). It may lay two

generations at most of "larval cocoons" per year, including a single larva per floret, which mainly feed on the central achenes of the flower, and that can be present from May to September (Myles and Binder, 1990).

Environmental Concerns
None known.

Seeds and Plant Production
Desert marigold seed should be planted on a weed free seedbed at ⅛ to ¼ inch depth during fall to early winter, or spring where winters are more severe to avoid dangers of frost. Late plantings might be possible in June or July for bloom production in the late summer and fall (Lenz, 1956; Lady Bird Johnson Wildflower Center, 2021). Containerized plants are started from seed, but seedling germination may be erratic, from 7 to 45 days. Transplant during the fall for plants to become well established. Prune plants during the fall or winter to a few inches above ground to remove damaged leaves and stems and to stimulate growth. Plants are short lived but can produce plenty of seeds in dry environments (Irish, 2006; Johnson, 1993). Mechanical seed collection can be completed with a seed stripper or combine. Harvested seed can be cleaned by processing with a brush machine or hammer mill and air screening equipment.

Cultivars, Improved, and Selected Materials (and area of origin)
Desert marigold is easily grown from seed, actively propagated in the horticultural trade and seed is readily available from commercial sources (USDA, 2019; Quinn, 2000). Cultivars should be selected based on the local climate, resistance to local pests, and intended use. Consult with your local land grant university, local extension, or local USDA NRCS office for recommendations on adapted cultivars for use in your area.

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