



## GARDNER'S SALTBUSH

### *Atriplex gardneri* (Moq.) D. Dietr.

Plant Symbol = ATGA

#### Alternate Names

*Common Names:* Gardner's saltbush, Nuttall's saltbush, Nelson's saltbush

#### Scientific Names:

*Atriplex buxifolia* Rydb.

*Atriplex gordonii* Hook.

*Atriplex nuttallii* S. Watson ssp. *buxifolia* (Rydb.) H.M. Hall & Clem.

*Atriplex nuttallii* S. Watson ssp. *gardneri* (Moq.) H.M. Hall & Clem.

Hybridization is common among saltbush species, resulting in taxonomy changes that make plant identification complex (Stutz, 1978; Welsh & Crompton, 1995; Robson, 2008).

#### Description

*General:* Gardner's saltbush is a warm-season perennial subshrub or shrub-forb that can grow to 20 inches tall (Jacobs, 2001; McArthur & Monsen, 2004; Robson, 2008). Gardner's saltbush has a woody base from a taproot with ascending to decumbent stems that can also develop adventitious roots (Nord et al., 1968). The lower one-third of the stem is less herbaceous than the upper two-thirds. Leaf arrangement, attachment and shape can vary. Leaves are alternate, opposite, or subopposite and petiolate or sessile. Leaf shape is linear, oblanceolate, obovate, spatulate or orbiculate. Leaves are simple with entire margins and a cuneate base (Robson, 2008; Fryer, 2020; USDA-NRCS, 2020; Welsh, 2020).

Gardner's saltbush is dioecious or monoecious. Inflorescence is a spike or panicle, 1 to 10 inches high with yellow or brown clustered flowers that are less than  $\frac{1}{4}$  inch long, sessile or on a stalk (Robson, 2008). Flowers develop from mid-May to early July and outside this period following heavy rains (Blaisdell & Holmgren, 1984). Fruiting bracteoles may have tubercles or four short wings (Robson, 2008). Seeds develop July through August, are teardrop-shaped, tan or brown in color, short in length and less than  $\frac{1}{10}$  of an inch wide (Robson, 2008). Reproduction occurs vegetatively and by seed (Nord et al., 1968).

*Distribution:* Gardner's saltbush is native to central North America, including British Columbia, Alberta, Saskatchewan, and Manitoba, Canada (USDA-NRCS, 2020). Noted in an early collection by Meriwether Lewis and William Clark, an 1806 specimen was collected along the Marias River in Toole County, Montana (The Lewis and Clark Herbarium, 2021). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

*Habitat:* Gardner's saltbush grows in drylands, salt desert shrub ecosystems, in mixed grasslands among sagebrush, saltbush and greasewood species and in pure stands (Nord et al., 1968; Blaisdell & Holmgren, 1984). It is considered a principal component of salt-desert shrub ranges (Blaisdell & Holmgren, 1984; McArthur & Monsen, 2004; Smith et al., 2016; Jonas et al., 2018).

#### Adaptation

Gardner's saltbush grows in semi-arid to temperate climates from 2,900 to 8,400 feet in elevation on ridgetops, slopes, uplands, canyon bottoms, rolling plains and in disturbed areas (McArthur & Monsen, 2004; Rocky Mountain Herbarium, 2008; Flora of North America, 2021). Well-adapted to saline fine-textured clay and sandy soils, Gardner's saltbush also grows easily in marine shale-derived soil (McArthur & Monsen, 2004; Flora of North America, 2021).



Figure 1. Gardner's saltbush. Photo courtesy: Matt Lavin, Montana State University, [Flickr](#), [CC 2.0](#).

## Uses

Gardner's saltbush is a beneficial year-round browse and forage for wildlife, sheep, and cattle and tolerates moderate use. Heavy use of Gardner's saltbush could be detrimental to regrowth (Blaisdell & Holmgren, 1984; Goodrich & Zobell, 2011; Smith et al., 2016). It grows on winter ranges and in areas with little precipitation (6 to 8 inches) where other vegetation may be sparse (Blaisdell & Holmgren, 1984; Goodrich & Zobell, 2011; Smith et al., 2016).

Wildlife benefitting from Gardner's saltbush year-round foliage include pronghorn antelope, mourning doves, chukars, sage grouse, songbirds, rodents, rabbits, reptiles, coyotes, bobcats, kit foxes, badgers, owls, hawks, eagles, and merlins (Blaisdell & Holmgren, 1984; Becker & Sieg, 1987). Gardner's saltbush also provides nectar and pollen for insects (Blaisdell & Holmgren, 1984).

Gardner's saltbush can establish and grow on extremely disturbed sites, including soils with high salinity. It is appropriate for mine reclamation, rangeland restoration, and soil stabilization (Burton, 1982; Blaisdell & Holmgren, 1984; Ewing & Dobrowski, 1992; McArthur & Monsen, 2004; Meyer, 2008).

Gardner's saltbush is somewhat inflammable and resprouts after fire, as such, it can be used a fuel break to stop or slow fire spread (Nord et al., 1968; Monsen & Kitchen, 1994; Fryer, 2020). In arid and semi-arid areas, Gardner's saltbush is used as an ornamental for its drought tolerance (Jonas et al., 2018; Fryer, 2020).

## Ethnobotany

Indigenous people made pinole flour by grinding the dried fruit of Gardner's saltbush (Utah State University Extension, 2017).

## Status

Gardner's saltbush is not a threatened or endangered species, wetland indicator species, or state noxious weed. Please consult the PLANTS Website (<http://plants.usda.gov/>) and your state's Department of Natural Resources for this species current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

## Planting Guidelines

Drill seeding is an effective method for establishing Gardner's saltbush. Seed should be dormant planted, after November 1 in Bridger, Montana, though spring plantings in April or May are possible (Carlson et al., 1984). For a full stand, 3 Pure Live Seeds (PLS) should be planted per square foot or linear foot or 1 PLS lb/acre (USDA-NRCS, 2013). For best results, seed should be planted as part of a native seed mix into a firm, weed-free seedbed (McArthur & Monsen, 2004; Jonas et al., 2018). Ideal seeding depths are ½ inch or less (Carlson et al., 1984).

## Management

Minimizing soil surface disturbance is the best management approach for Gardner's saltbush (Blaisdell & Holmgren, 1984). Newly seeded Gardner's saltbush sites should be protected from livestock grazing for three or more years (Jonas et al., 2018). Once established, grazing can occur when plants are dormant, but should cease before spring plant growth ensues (Jonas et al., 2018). Gardner's saltbush should not be grazed heavily as weedy and invasive species such as halogeton (*Halogeton glomeratus*) and cheatgrass (*Bromus tectorum*) can replace it (Goodrich & Zobell, 2011; Jonas et al., 2018). Halogeton is poisonous to sheep and cattle and reduces forage when it outcompetes Gardner's saltbush (Blaisdell & Holmgren, 1984; USDA-NRCS, 2008). Consider resting Gardner's saltbush areas from livestock use (Jonas et al., 2018). Use diversionary seed and install exclusion cages to protect new seedlings (Jonas et al., 2018).

Weed control is critical during the first year of Gardner's saltbush establishment and can be accomplished with cultivation and hand-hoeing (Carlson et al., 1984). Herbicide can be applied in the second year and thereafter as needed (Carlson et al., 1984).



Figure 2. Gardner's saltbush. Photo courtesy: Matt Lavin, Montana State University, [Flickr](#), [CC 2.0](#).

### Environmental Concerns

Gardner's saltbush is not considered weedy or invasive. However, in warmer and drier climates in its range, Gardner's saltbush could replace semidesert vegetation in the Greater Yellowstone Ecosystem given the appropriate soil types (Romme & Turner, 1991). No known pests or problems are associated with the species.

### Seeds and Plant Production

Full stand seed production entails dormant fall drill seeding of de-winged seeds at 3 PLS per linear foot at approximately ½ inch in depth (Carlson et al., 1984; USDA-NRCS, 2013). Irrigate to keep soil moisture above 50% field capacity. Hand-hoe or cultivate to remove weeds. In the first year after seeding, and no later than the third week in November in Bridger, Montana, Gardner's saltbush is mowed to 3-inch stubble height with a rotary mower (Carlson et al., 1984).

In the second and subsequent years, hand-hoe, cultivate, or apply herbicide once or twice for weed management. Irrigate once before and once after flowering. A full canopy is achieved by mid-to-late summer (Carlson et al., 1984).

Seed harvest typically occurs between September 20 and October 18 in Bridger, Montana. Gardner's saltbush is cut and wind-rowed with a hay swather to allow immature seed to ripen before processing. A conventional grain combine set to 1,450 rpm cylinder speed, 3/16-inch cylinder spacing, with ¼ inch screen, is used to separate seed from stem. Gardner saltbush averages 77,000 seeds per pound after seed cleaning (Carlson et al., 1984).

### Cultivars, Improved, and Selected Materials (and area of origin)

There are no known Gardner's saltbush seed sources for conservation purposes. Plant selections (cultivars, germplasms, and seed sources) should be chosen 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 field office for recommendations on adapted seed sources for use in your area.

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Figure 3. Gardner's saltbush. Photo courtesy: Matt Lavin, Montana State University, [Flickr](#), [CC 2.0](#).

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