

LOW SAGEBRUSH

Artemisia arbuscula Nutt.

Plant Symbol = ARAR8

Including:

Low sagebrush, *A. arbuscula* Nutt. ssp. *arbuscula* (ARARA)

Lahontan sagebrush, *A. arbuscula* Nutt. ssp. *longicaulis* Winward & McArthur (ARARL3)

Alkali sagebrush, *A. arbuscula* Nutt. ssp. *longiloba* (Osterh.) L.M. Shultz (ARARL)

Hotsprings sagebrush, *A. arbuscula* Nutt. ssp. *thermopola* Beetle (ARART)

Contributed by: USDA NRCS Plant Materials Center, Aberdeen, Idaho



Low sagebrush. Photo by Matt Lavin., Montana State University.

Alternate Names

Dwarf sagebrush
Early sagebrush
Gray sagebrush
Little sagebrush

Uses

Wildlife/livestock: Low sagebrush is browsed by deer, pronghorn, elk and sheep. It is preferred by mule deer in winter and spring (Blaisdell et al., 1982). It is rated as preferred by pronghorn year round (Ogle and Brazee, 2009), but is especially utilized during summer in low desert scrub communities. Palatability and usage of low sagebrush varies by ecotype (Francis, 2004).

Low sagebrush provides cover to small mammals, reptiles and birds. Due to its low stature, value as cover for large mammals is limited.

Erosion: Low sagebrush frequently grows on arid, sterile soils that would otherwise be uninhabited. It provides essential cover and root structure for erosion control (Francis, 2004).

Status

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

Description

General: Sunflower family (Asteraceae). Low sagebrush is a short statured mounded evergreen shrub reaching heights of 20 to 40 cm (8 to 16 in) with flowering stems rising 10 to 30 cm (4 to 12 in) above the canopy. The trunk is poorly defined with the branches diverging from the caudex below the soil surface. The leaves are fan shaped, grayish green, 0.5 to 1.5 cm (0.2 to 0.6 in) long with 3 lobes at the tip. The flowers are born in heads (capitula) in a spicate inflorescence up to 2 cm (0.8 in) wide, with 4 to 11 perfect disc flowers per head. The leaves on the inflorescence are deciduous and deeply 3-lobed. The fruit is an achene approximately 0.7 mm (0.03 in) long (Shultz, 2009).

Low sagebrush can be separated from big sagebrush (*A. tridentata*) by its narrow spicate inflorescence. It differs from black sage (*A. nova*) by having sessile capitula, hairy involucre and lobed leaves on the flowering stems (Shultz, 2009).

Hotsprings sagebrush is a shorter, dwarf form of low sagebrush ranging from 15 to 23 cm (6-9 in) tall. The leaves are more deeply lobed than the other subspecies and resemble leaves of three-tip sagebrush (*A. tripartita*) with which it is often confused. Morphology and distribution suggest a parentage of three-tip sagebrush and low sagebrush (Shultz, 2009).

Lahontan sagebrush has longer flower stalks than low sagebrush. Mature plants reach 30-90 cm (12 to 35 in) tall. It is endemic to northwestern Nevada and adjacent portions of Oregon and California. This subspecies is believed to be the result of a hybridization of low sagebrush and Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*) (Winward and McArthur, 1995).

Alkali sagebrush differs primarily from the other subspecies by flowering earlier in the season, from late spring to early summer. It can also be distinguished by having a middle lobe of the leaves which overlap the two lateral lobes (Shultz, 2009).

Distribution: Low sagebrush and alkali sagebrush are found in the Intermountain and Rocky Mountain regions in Utah, Idaho Nevada, Oregon Washington, Wyoming, northern California, Colorado and western Montana (Shultz, 2009). Hotsprings sagebrush occurs in Idaho, Oregon, Utah and Wyoming. Lahontan sagebrush is known from northwestern Nevada and adjacent areas of California and Oregon (Winward and McArthur, 1995). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Low sagebrush occurs in a wide variety of habitats including valley bottoms, alkali basins, mountain slopes, and on dry wind-swept ridges (Shultz, 2009; Welsh et al., 2003). This species forms pure stands or can be found as a co-dominant species with basin and Wyoming big sagebrush, or with black sagebrush. At lower elevations it becomes a member of the salt desert scrub community with shadscale (*Atriplex confertifolia*), greasewood (*Sarcobatus* spp.) and horsebrush (*Tetradymia* spp.). At higher elevations it is associated with pinyon-juniper and mountain shrub communities.

Adaptation

Low sagebrush in general inhabits dry sterile rocky and alkaline clay soils in areas receiving 25 to 70 cm (10 to 26 in) annual precipitation with a pH of 5.5 to 8.6 (USDA-NRCS, 2012). Low sagebrush typically grows in sites drier than those occupied by big sagebrush taxa, and at higher elevation or in areas with more moisture than black sagebrush (Tisdale and Hironaka, 1981). Low sagebrush will occasionally form a mosaic of patches with big or black sagebrush indicating localized soil differences (McArthur and Stevens, 2004).

Subspecies *arbuscula* prefers rocky soils on high valleys, mountain slopes, basins and ridges at elevations of 1,500-3,800m (4,900to 12,500 ft). Alkali sagebrush occurs primarily on clay soils in basins and valleys at 1,500 to 2,800 m (4,900 to 9,000ft). Lahontan sagebrush is widespread and occurs in shallow soils in areas receiving 17 to 35 cm (7 to 14 in) of annual precipitation. Hotsprings sagebrush has been found growing on rocky igneous soils from 2,200 to 2,800 m (7,200 to 9,000 ft) in elevation (Shultz, 2009).

Establishment

Low sagebrush can be broadcast or drill seeded in the fall into a firm, weed-free seed bed. Seed is small and should be planted no deeper than 1.5 mm (0.0625 in). Despite its small size, low sagebrush has relatively good seedling vigor and can be seeded with forbs (McArthur and Stevens, 2004). Low sagebrush should be seeded at approximately 0.025 lb/ac for range plantings with a target goal of establishing approximately 400 plants per acre (Ogle et al., 2011). Seeding rates should be doubled when broadcast seeding. When seeding with grasses, alternate row seedings are recommended. Seedlings establish quickly with rapid root development. Wildings

have also been successfully transplanted in spring or fall. Low sagebrush has not been successful on sites dissimilar to the original collection site. Seedlings establish but do not persist or reproduce (McArthur and Stevens, 2004).

Management

Plants are susceptible to fire (Britton and Ralphs, 1979) however low sagebrush often forms expansive plant communities with little understory to carry fire. Low sagebrush can invade sites seeded to perennial grasses. It grows on exposed sites which are often wintering areas for many animals. It is susceptible to 2,4-D (Hormay et al., 1962).

Pests and Potential Problems

Sagebrush taxa are occasionally susceptible to limited outbreaks of the sagebrush defoliator moth, or webworm, (*Aroga websteri*). There are also several microbial and fungal pathogens known to attack big sagebrush. Although these may inflict serious damage locally, they have not been viewed as a great threat to sagebrush populations.

Environmental Concerns

Low sagebrush is native to western North America. It will spread under favorable conditions but does not pose any environmental concern to native plant communities.

Seed and Plant Production

Low sagebrush seed is collected from natural populations. The low stature of this species makes it difficult to collect seed resulting in high seed prices (McArthur and Stevens, 2004). Low sagebrush seed has a low level of dormancy and requires a cold stratification period for germination (Bonner and Karrfalt, 2008). A ten day chill period is recommended for container seeding (Vories, 1981).

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

Wildland collected seed is available commercially.

References

- Blaisdell, J.P., Murray, R.B., and E.D. McArthur. 1982. Managing Intermountain rangelands-sagebrush-grass ranges. Gen. Tech. Rep. INT-134. Ogden, UT: USDA-Forest Service, Intermountain Forest and Range Experiment Station. 41p.
- Bonner, F.T. and R.P. Karrfalt (eds.). 2008. The Woody Plant Seed manual. Agriculture Handbook 727. USDA Forest Service, National Seed Laboratory, Dry Branch, GA. 1223p.
- Britton, C.M, and M.H. Ralphs. 1979. Use of fire as a management tool in sagebrush ecosystems. In: The sagebrush ecosystem: a symposium: Proceedings; 1978 April; Logan, UT. Utah State University. 101-109.
- Francis, John K. ed. 2004. Wildland shrubs of the United States and its Territories: thamnisc descriptions: volume 1. Gen. Tech. Rep. IITF-GTR-26. San Juan, PR: USDA, Forest Service, International Institute of

- Tropical Forestry, and Fort Collins, CO: USDA, Forest Service, Rocky Mountain Research Station. 830 p.
- Hormay, A.L Alberica, F.J, and P.B. Lord. 1962. Experiences with 2,4-D spraying on the Lassen National Forest. *Journal of Range management* 15(6): 325-328.
- McArthur and Stevens. 2009. Composite Shrubs. In: S.B. Monsen, R. Stevens, and N.L. Shaw [compilers]. Restoring western ranges and wildlands. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-136-vol-2. p. 493-537.
- Ogle, D., and B. Brazee. 2009. Estimating initial stocking rates. USDA-NRCS Technical Note No. 3. Boise, Idaho. 39p.
- Ogle, D., St. John, L., Stannard, M., and L. Holzworth. 2011. Technical Note 24: Conservation plant species for the Intermountain West. USDA-NRCS, Boise, ID-Salt Lake City, UT-Spokane, WA. ID-TN 24. 57p.
- Shultz, L.M. 2009. Monograph of *Artemisia* subgenus *Tridentatae* (Asteraceae-Anthemideae). *Systematic Botany Monographs* vol. 89. The American Society of Plant Taxonomists. 131p.
- Tisdale, E.W. and M. Hironaka. 1981. The sagebrush-grass region: a review of the ecological literature. Bull. 33. Moscow, ID: University of Idaho, Forest, Wildlife and Range Experiment Station. 31p.
- [USDA NRCS] USDA Natural Resources Conservation Service. 2011. The PLANTS Database, version 3.5. URL: <http://plants.usda.gov> (accessed 29 Jan 2012). Baton Rouge (LA): National Plant Data Center.
- Vories, K.C. 1981. Growing Colorado plants from seed: a state of the art. Volume I. Shrubs. Gen. Tech. Rep. INT-103. Ogden, UT: USDA-Forest Service, Intermountain Forest and Range Experiment Station. 80p.
- Welsh, S.L., Atwood, N.D., Goodrich, S., and L.C. Higgins. 2003. *A Utah Flora*. Third Edition, revised. Brigham Young University, Provo, UT.
- Winward, A.H. and E.D. McArthur. 1995. Lahontan sagebrush (*Artemisia arbuscula* ssp. *longicaulis*): a new taxon. *Great Basin Naturalist* 55(2): 151-157.

Prepared By:

Derek Tilley, USDA NRCS Plant Materials Center, Aberdeen, ID

Loren St. John, USDA NRCS Plant Materials Center, Aberdeen, ID

Citation

Tilley, D. and L. St. John. 2012. Plant Guide for low sagebrush (*Artemisia arbuscula*). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho 83210.

Published: February, 2012

Edited: 9Feb2012djt;9Feb2012ls;

For more information about this and other plants, please contact your local NRCS field office or Conservation District at <http://www.nrcs.usda.gov/> and visit the PLANTS Web site at <http://plants.usda.gov/> or the Plant Materials Program Web site <http://plant-materials.nrcs.usda.gov>.

PLANTS is not responsible for the content or availability of other Web sites.

USDA IS AN EQUAL OPPORTUNITY PROVIDER AND EMPLOYER