

ATRIPLEX POLYCARPA* (TORREY) S. WATSON*COMMON NAME: CATTLE SALTBUSH, ALLSCALE, CATTLE SPINACH****FAMILY: AMARANTHACEAE (FORMERLY CHENOPODIACEAE)****GROWTH FORM: SHRUB**

A. polycarpa at the Little Panoche Reservoir Wildlife Area (managed by the California Department of Fish and Game).

PLANTING

During January 2003, seeds were hand-sown onto mounded planting beds, and a thin layer of soil was then raked over them. The species was seeded heavily¹ and germination was so dense that the plants had to be thinned to prevent crowding. The first seed harvest from the plants was made during December 2004. During winter of 2004, seeds of *A. polycarpa* were sown in a different area of the nursery. The Tranquillity area has a semi-arid climate with low mean annual precipitation. However, both the 2002-03 and 2004-05 growing seasons were favorable years for shrub establishment at the nursery. Total precipitation received during the 2002-03 hydrologic year (1 August 2002 through 31 July 2003), 17.6 cm, was 80.2% of the 30-year mean², and total precipitation received during the 2004-05 hydrologic year, 28.2 cm, was 128.2% of the 30-year mean (California Irrigation Management Information System, Station #105).

PHENOLOGY

We have observed *A. polycarpa* seedlings growing at the nursery at several times throughout the year; the species does not seem to require a high level of soil moisture for germination. When growing in the San Joaquin Valley, *A. polycarpa* typically flowers during August and September and will begin to form fruits by October. Peak time for seed collection is late November to mid-December. During

¹ One large handful of seed (approximately 60% purity) per 0.5-meter length of a planting bed. Viability of the seed lot was unknown.

² The annual and monthly means were calculated using 30 years of precipitation data (1976-2006) from four weather stations (Cooperative Station ID #'s 43083, 45118, 45119, 45120) located in the western San Joaquin Valley.

winter, the plants go dormant and drop their leaves. Plants will begin to display new growth during spring.

SEED DORMANCY & GERMINATION

According to Sankary & Barbour (1972), seeds of this species do not exhibit dormancy. Professional germination tests performed on several of our *A. polycarpa* seed lots did not indicate any seed dormancy. Soaking seeds in water before sowing them has been recommended, in order to remove inhibitors (Graham, 2003). It has been demonstrated that plant-produced chemicals such as saponins can inhibit or reduce germination in *A. polycarpa* (Cornelius and Hylton, 1969, Askham and Cornelius, 1971).

SEED HARVESTING

A. polycarpa seeds are enclosed within fruiting bracts. Fruits (utricle) are ready for collection when they are light yellow or light brown in color and have a hard consistency at their center. Immature fruits will have a soft consistency when squeezed between two fingers. We have noticed that the fruit size of *A. polycarpa* is quite variable between years. To harvest plant material, we would: 1) strip fruits off by hand; 2) shake fruits off branches into a collecting bag; or 3) clip off fruit-bearing branches. Because the seed collection window occurs during the winter monsoonal period, rainfall can potentially disperse a portion of the fruits before they can be harvested. If plant material is wet when collected, it must be allowed to dry before seed processing can begin. We would transport the harvested plant material to a warehouse and spread it out on tarpaulins to air dry. We would set up a few electric fans to facilitate drying and turn the plant material at least once a day.

SEED PROCESSING METHODS

Using a hammer mill, raw plant material is reduced into a coarse but uniform mixture of fruits, chaff (e.g., leaves, floral structures), and pieces of stems and branches. In order to completely remove fruits from branches and stems, we would sometimes run the plant material through the hammer mill several times. Seeds can then be separated from chaff and woody material using an air screen cleaner such as a Clipper Eclipse (made by the A.T. Ferrell Company).

CULTIVATION OVERVIEW

Numerous *A. polycarpa* individuals derived from two wild source populations have been established in the nursery since 2003, and they have reliably produced seed every year. Individuals derived from a third wild source population have been established in the nursery since 2005.

The species seems to tolerate growing at high density in the nursery, though we have observed that individuals growing in isolation are much larger (3 meters in diameter) than individuals that are surrounded by other shrubs (1.5 meters in diameter). The species is well adapted to dry growing conditions; it has never appeared drought-stressed at the nursery and does not require any supplemental watering. Through seed dispersal, the species frequently became established in areas of the nursery where it had not been planted. We occasionally had to remove such 'volunteer' individuals when they encroached upon other cultivated native species.

A. polycarpa is halophytic and would likely tolerate the elevated soil salinity that is characteristic of the retired agricultural lands in the western San Joaquin Valley.

A horticultural entry included in The Jepson Manual recommends that *A. polycarpa* is an especially good species to use for stabilizing or restoring disturbed or degraded areas. However, the species is also described as potentially invasive due to its ability to outcompete or displace other species (Hickman, 1993).

REFERENCES

Hickman, J. C. (editor). 1993. The Jepson manual: higher plants of California. University of California Press, Berkeley.

ADDITIONAL INFORMATION ABOUT *ATRIPLEX POLYCARPA*:

Internet Resources

Plant Guide by the Natural Resources Conservation Service available at: <http://plant-materials.nrcs.usda.gov/pubs/azpmcpg5107.pdf>

Propagation Protocol from the Native Plant Network (Graham, 2003): http://nativeplants.for.uidaho.edu/network/view.asp?protocol_id=2587

Literature

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PREPARED BY

Brianna D. Borders, Restoration Botanist.

Other Contributors: Dr. Nur Ritter, Justine Kokx, Adrian Howard, and Graham Bidy.

PHOTOS

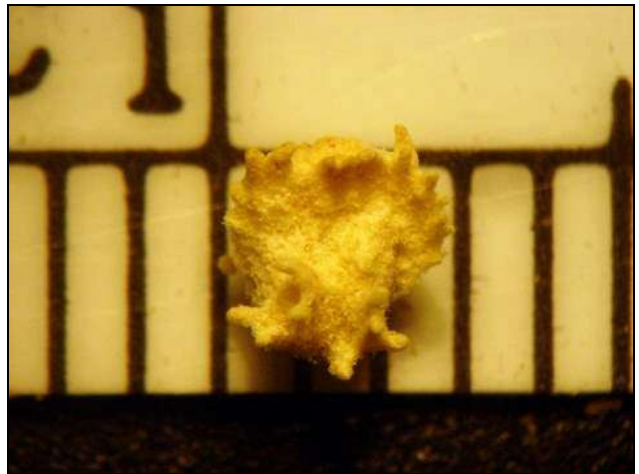


A. polycarpa volunteers growing at the native plant nursery. Through seed dispersal, the species frequently became established in areas of the nursery where it had not been planted.





A. polycarpa at the Little Panoche Reservoir Wildlife Area.



A. polycarpa seed. Scale shown is millimeters.



Each *A. polycarpa* seed is enclosed within fruiting bracts. Scale shown is millimeters.