

ISOMERIS ARBOREA* NUTT.*COMMON NAME: BLADDERPOD****FAMILY: BRASSICACEAE (FORMERLY
CAPPARACEAE)****GROWTH FORM: SHRUB****PLANTING**

During January 2003, seeds were hand-sown onto mounded planting beds, and a thin layer of soil was then raked over them. The seeds germinated readily without any form of pre-treatment. The first seed harvest from the plants was made during July 2004. Additional seed lots of *I. arborea* were sown during three consecutive growing seasons and plants became successfully established.

PHENOLOGY

The species does not seem to have defined phenological patterns. We have observed *I. arborea* 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. We have observed the species in flower at several times throughout the year, with the exception of December and January. Therefore, the species produces seed more than once per year.

SEED HARVESTING

Fruits are capsules and are ready for collection when they turn brown and have a crisp texture. Mature fruits will often split open at their seam, revealing the seeds inside. We strip mature fruits from plants by hand into collecting bags. Seed color is variable, ranging from very light brown to dark brown. X-ray analysis has indicated that light-colored seeds of *I. arborea* have lower viability than dark-colored seeds (Lippitt et al., 1994).

SEED PROCESSING METHODS

Due to the large size of the seeds and the minimal amount of chaff produced when the fruits are crushed or broken, it is easy to process seed lots of *I. arborea*. For a small volume of plant material, fruits can be broken open by hand to release the seeds. We have also used a household blender on pulse mode to break open fruits. In order to prevent damage to the seeds, the blender blade needs to first be coated with a plastic dip (Thomas, 2003). For a large volume of plant material, we have used a hammer mill

to break open the capsules. Following this, we have used both a Clipper Office Tester (made by the A.T. Ferrell Company) and an air separator (Seed Tech Systems, LLC.), to separate seeds from the pieces of broken capsules.

Seeds per gram = 18¹**CULTIVATION OVERVIEW**

Numerous *I. arborea* individuals derived from two wild source populations have been established at the nursery since 2003, and have reliably produced seed each year. The species thrives at the nursery and does not require any irrigation. Some of the individuals at the nursery measure nearly 3 meters in diameter. The species became widely established at the nursery outside of its original planted area, presumably through seed dispersal by wildlife. We occasionally discovered small caches of *I. arborea* seed buried in the soil at the nursery. We have often observed broken, empty capsules below *I. arborea* plants and we believe that birds harvest seeds from the plants. The species is a host plant for the adult harlequin bug (*Murgantia histrionica*), though we have never observed the insects at the nursery.

A horticultural entry included in The Jepson Manual recommends that *I. arborea* requires excellent drainage, is intolerant of summer water, and does best in full or nearly full sun (Hickman, 1993). The soils at the nursery are Tranquillity clay with poor drainage, but the established *I. arborea* plants have persisted and they appear healthy.

REFERENCES

- Hickman, J. C. (editor). 1993. The Jepson manual: higher plants of California. University of California Press, Berkeley.
- Thomas, D. 2003. Modifying blender blades for seed cleaning. Native Plants Journal 4: 72-73.

ADDITIONAL INFORMATION ABOUT ISOMERIS ARBOREA:*Internet Resources*

Species profile from the Ladybird Johnson Wildflower Center at the University of Texas:

http://www.wildflower.org/plants/result.php?id_plant=CLIS

Seed photos from the Rancho Santa Ana Botanic Garden:

<http://www.hazmac.biz/060109/060109IsomerisArborea.html>

Propagation Protocol from the Native Plant Network:

http://nativeplants.for.uidaho.edu/network/view.asp?protocol_id=2566

Isomeris arborea has been the subject of several Master's theses completed at San Diego State University:

<http://libpac.sdsu.edu/search/~?searchtype=X&searcharg=isomeris&SORT=D>

¹ This figure (n = 5; standard deviation = 2) is derived from a seed lot harvested in 2008 from a wild population.

Literature

English-Loeb, G.M. and B. D. Collier. 1987. Nonmigratory movement of adult harlequin bugs *Murgantia histrionica* (Hemiptera: Pentatomidae) as affected by sex, age and host plant quality. *American Midland Naturalist* 118: 189-197.

Goldstein, G., M.R. Sharifi, L.U. Kohorn, J.R.B. Lighton, L. Shultz, and P.W. Rundel. 1991. Photosynthesis by inflated pods of a desert shrub, *Isomeris arborea*. *Oecologia* 85: 396-402.

Kay, B.L., C.C. Pergler, and W.L. Graves. 1984. Storage of seed of Mojave desert shrubs. *Journal of Seed Technology* 9: 20-28.

Krupnick, G.A., A.E. Weis, and D.R. Campbell. 1999. The consequences of floral herbivory for pollinator service to *Isomeris arborea*. *Ecology* 80: 125-134.

Lippitt, L., M.W. Fidelibus, and D.A. Bainbridge. 1994. Native seed collection, processing, and storage for revegetation projects in the western United States. *Restoration Ecology* 2: 120-131. Truesdale H.D., L.R. McClenaghan, B.D. Collier, L. Burmeister, and K.J. Rice. 2004. Allozyme variability within and among varieties of *Isomeris arborea* (Capparaceae). *Madroño* 51: 364–371.

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PHOTOS



I. arborea with immature fruits.



I. arborea volunteer at the native plant nursery. *Phacelia ciliata* (Great Valley phacelia) is on the left.



I. arborea with mature fruits.



I. arborea seedlings in the greenhouse. Some of the seed leaves still have the large brown seed attached.