

TRICHOSTEMA OVATUM* CURRAN*COMMON NAME: SAN JOAQUIN BLUECURLS****FAMILY: LAMIACEAE****GROWTH FORM: ANNUAL HERB****PLANTING**

The Tranquillity area is characterized by a semi-arid climate with minimal and unpredictable rainfall. Ideally, seeds of this species would be planted by the beginning of February, to maximize the likelihood that they will receive sufficient precipitation to germinate in the spring. However, we have planted the species as early as November. Seeds were hand-sown onto mounded planting beds, and a thin layer of soil was then raked over them. The seeds germinate readily without any form of pre-treatment.

PHENOLOGY

T. ovatum is a warm season annual and completes its life cycle during the hot, dry conditions of the summer months. The species is endemic to the San Joaquin Valley of California. In various years, we have observed *T. ovatum* germinating in March, April, and May, but we are not sure which month is the most typical. The species has a long flowering window; peak flowering time is from June through August. However, we have observed the species in flower as early as May and as late as October. Seeds begin to

mature in August and can typically be collected through the middle of October.

SEED HARVESTING

Fruits (seeds) are nutlets and are ready for collection when they turn a dark brown or dark gray color. Mature seeds are conspicuous on plants in contrast to the senescing foliage (see photo). Seeds mature continuously over a period of several weeks, and therefore seed collection on multiple dates is ideal. *T. ovatum* plants often have multiple stems, and some will bear mature seeds before others. We selectively harvest the stems with mature seeds and leave the rest of the plant behind to mature; stems can be broken off from the base of the plants by hand. It is not advisable to wait for all of the seeds on a given plant to mature, with the intention of collecting the whole plant. By the time the last seeds have matured, a significant portion of the seed crop will already have been dispersed. We would transport the harvested plant material to a warehouse and spread it out on tarpaulins to air dry, before seed processing.

SEED PROCESSING METHODS

Using a hammer mill, raw plant material is reduced into a coarse but uniform mixture of seeds and associated chaff (e.g., pieces of stems, leaves, floral structures). Seeds can then be separated from chaff using either a Clipper Office Tester or Clipper Eclipse (both made by the A.T. Ferrell Company). An air separator (Seed Tech Systems, LLC.) can be used to remove additional lightweight chaff. For relatively small seed lots or in the absence of the equipment mentioned, plant material can be broken up by rubbing it over a screen or sieve. Wire mesh sieves with various screen sizes can then be used to separate seeds from chaff.

CULTIVATION OVERVIEW

T. ovatum was sown in the nursery for five years, and we were able to harvest seed during four of the years. We observed that the placement of floating row cover over a bed of planted seed substantially improved germination. We have observed that senesced plants sometimes break off at the base of the stem and tumble with the direction of the wind, thereby dispersing their seeds. Due to its aromatic and glandular nature, the species is not susceptible to wildlife herbivory.

During the 2007 hydrologic year (1 August 2006 to 31 July 2007), total precipitation received, 7.1 cm (2.8 in), was only 32.2% of the 30-year mean¹. Rainfall received at the nursery was at least 25% below average for every month with the exception of April 2007 when rainfall received, 1.45 cm (0.57 in), was within 25% of the 30-year mean. During the summer of 2007, nursery-grown *T. ovatum* plants were numerous and robust, with high seed output.

During the 2008 hydrologic year (1 August 2007 to 31 July 2008), total precipitation received, 11.18 cm (4.4 in), was 50.7% of the 30-year mean. Rainfall received at the nursery was at least 25% below average for every month with the exception of January 2008 when rainfall received,

¹ 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.

7.19 cm (2.83 in), was 64% above the 30-year mean. During the summer of 2008, only a few *T. ovatum* individuals germinated.

These observations indicate that *T. ovatum* germination is dependent on spring rainfall. Though the 2008 hydrologic year was characterized by a higher amount of total precipitation than the 2007 hydrologic year, it seems that a lack of rainfall during spring 2008 negatively affected *T. ovatum* germination. When cultivating this species for the purpose of seed production, irrigation during a dry spring may be necessary to facilitate germination.

To view precipitation data for the Tranquillity area from 1997-2008, please visit:

<http://esrp.csustan.edu/projects/lrdp/restdata/precip/>

With the exception of one dry growing season, *T. ovatum* performed well at the nursery; it germinated readily, grew vigorously, and reliably produced seed. However, weed control was an important factor in our success with cultivating *T. ovatum*. The dominant weed species at the nursery germinate so densely and grow so aggressively that in the absence of weed control, they would have significantly hindered the growth of the planted natives. The use of irrigation in response to seasonally low rainfall was also a contributing factor in our success with cultivating *T. ovatum*.

ADDITIONAL INFORMATION ABOUT *TRICHOSTEMA OVATUM*:

Internet Resources

California Native Plant Society's Inventory of Rare and Endangered Plants: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi/Go?id=trichostema_ovatum&sort=DEF_AULT&search=Trichostema%20ovatum

Literature

Spira, T.P. 1980. Floral Parameters, Breeding System and Pollinator Type in *Trichostema* (Labiatae). *American Journal of Botany* 67: 278-284.

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PHOTOS





When seeds are mature and ready for collection, they are conspicuous on plants in contrast to the senescing foliage.



T. ovatum seeds. Scale shown is millimeters.



T. ovatum seed. Scale shown is millimeters.

T. ovatum growing intermixed with *Trichostema lanceolatum* (vinegar weed) at the Kerman Ecological Reserve (managed by the California Department of Fish and Game)