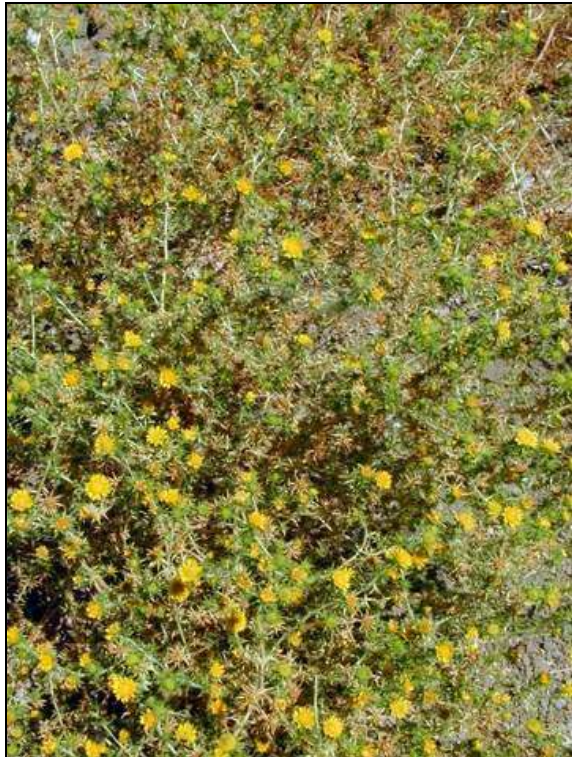


CENTROMADIA PUNGENS* (HOOK. & ARN.)*GREENE SSP. *PUNGENS*****FORMERLY *HEMIZONIA PUNGENS*****COMMON NAME: COMMON TARWEED****FAMILY: ASTERACEAE****GROWTH FORM: ANNUAL HERB****PLANTING**

Ideally, seeds of this species would be planted during October, before the winter monsoonal period of November through March. However, we have planted the species as late as December. 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

When growing in the San Joaquin Valley, *Centromadia pungens* ssp. *pungens* germinates in late winter or early spring, and may begin flowering as early as April. We have observed plants in flower throughout the summer, and seeds can be collected from May through October. We have frequently observed senesced plants alongside plants that are at peak flower.

SEED DORMANCY

Professional germination tests performed on three seed lots¹ of *C. pungens* indicated that a portion of the seeds (27,

53, and 66%) were dormant. However, the dormancy mechanism is unknown.

SEED HARVESTING

Seeds are mature and ready for collection when they are medium to dark brown in color and have a hard consistency. We have observed that some of the seeds have a more or less smooth surface whereas some have a rough, encrusted surface. Seeds are retained well as plants senesce. Once seeds are mature, entire plants can be collected by hand or with a pitchfork. If collecting plants by hand, gloves are necessary to protect skin from the plants' sharp spines. It is ideal to minimize the amount of soil that is collected along with the plants; soil particles that are of a similar size and weight as the seeds can be very difficult to remove during seed processing.

We would transport harvested plant material to a warehouse and spread it out on tarpaulins to air dry, before seed processing. 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 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.

CULTIVATION OVERVIEW

C. pungens was sown in the nursery for five consecutive years, and reliably produced seed each year. In the two most recent growing seasons, the species was not planted but numerous individuals germinated out of the soil seed bank. Due to its spiny nature, this species is not susceptible to browsing by herbivores. We have observed significant variability in plant size. Some plants are large, sprawling, and many-branched, whereas others are diminutive and have an unbranched stem.

C. pungens 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 *C. pungens*. 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. Additionally, we sometimes irrigated the nursery in response to seasonally low rainfall.

WEED STATUS

Centromadia pungens ssp. *pungens* has been introduced to the Columbia River Basin of Oregon and Washington, where it is considered an invasive weed and an agricultural pest. Several counties in northeastern Oregon and southeastern Washington have designated the species as a noxious weed (Randall 1995).

¹ One seed lot was produced at our native plant nursery, one seed lot was collected from a wild population in Fresno County, and for one seed lot, a wholesale seed company shared its seed testing results with us.

ADDITIONAL INFORMATION ABOUT *CENTROMADIA PUNGENS* SSP. *PUNGENS*:

Randall, J.M. 1995. Elemental Stewardship Abstract for *Hemizonia pungens*. The Nature Conservancy, Arlington, Virginia. Available at: <http://www.imapinvasives.org/GIST/ESA/esapages/documnts/hemipun.pdf>

Photos from The Nature Conservancy: <http://www.imapinvasives.org/GIST/ESA/esapages/hemipung.html>

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PHOTOS



C. pungens (with yellow flowers) at the Alkali Sink Ecological Reserve (managed by the California Department of Fish and Game).



C. pungens seeds. Scale shown is millimeters.



C. pungens seed. Scale shown is millimeters.

C. pungens seedling, March 2009