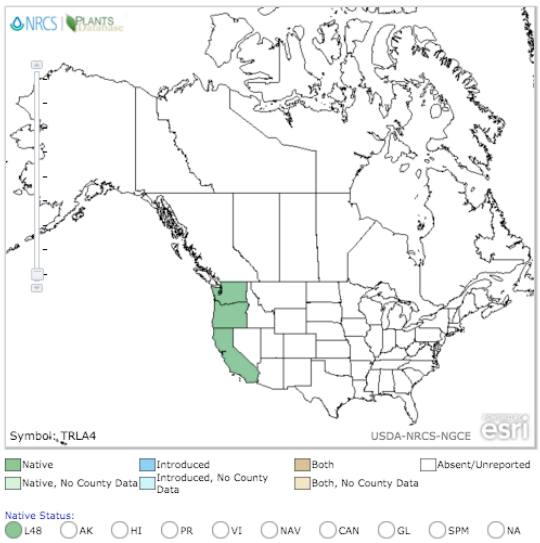
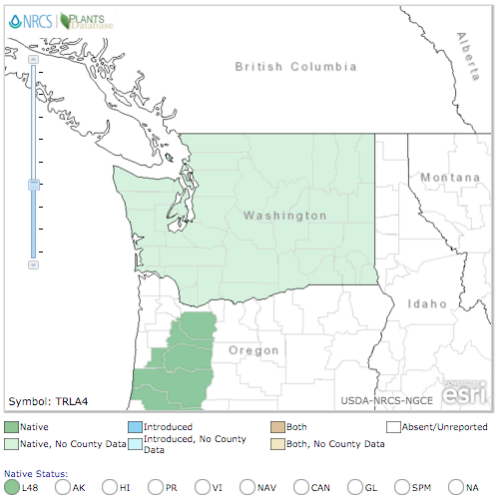
Plant Propagation Protocol for *Trichostema lanceolatum*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*TRLA4.pdf*



North America distribution map



Washington State distribution map

Image credits: USDA

TAXONOMY	
Plant Family	
Scientific Name	Laminaceae
Common Name	Vinegar weed
Species Scientific Name	
Scientific Name	*Trichostema lanceolatum* Benth.
Varieties	None
Sub-species	None
Cultivar	None
Common Synonym(s)	None
Common Name(s)	Blue-curls, camphor weed, romero, yerba del aigre, stinkweed, turpentine weed, wild rosemary. (USDA)
Species Code	TRLA4
GENERAL INFORMATION	
Geographical range	See distribution maps above. Vinegar weed is an annual forb or herb native to California and Oregon (USDA). It currently occurs in Washington and along the Pacific Coast Ranges from northern Oregon to northern Baja.
Ecological distribution	*T. lanceolatum* is found in dry, open fields and disturbed habitats such as roadsides. (USDA) It is also known to occur in grasslands, oak woodlands, newly planted vineyards and orchards. (Di Tomaso 2013)

Climate and elevation range	*T. lanceolatum* grows primarily at elevations below 1000 meters. (USDA) However, it can occur as high as 2200 meters (Jepson, 2012). It can survive in areas that receive between 10 and 81 inches of annual precipitation. (Calflora 2016)
Local habitat and abundance	Plants are extremely xerophytic (require very little liquid water)—prefer climates such as the dry, rainless summers of California's Mediterranean-like climate and does not tolerate frequent watering. (USDA)
Plant strategy type / successional stage	*T. lanceolatum* is an early seral component of coastal sage scrub, chaparral, and oak woodland communities. (USDA) Phytotoxic vapors and extracts from its leaves have been shown to inhibit germination and growth of other plants *in vitro*. These phytotoxins help *T. lanceolatum* to compete by killing other plant species. (Heisey and Delwiche 1985)
Plant characteristics	  *Photo credits: Yosemitehikes.com (l), Leroy Abrams (r)* From the mint family, *Trichostema lanceolatum* Benth. is an annual forb/medicinal herb named for its pungent odor that can be detected over long distances. Plants range from 1 to 10 dm. tall. (USDA) **Leaves:** Thin, 2-7cm long lance-shaped leaves, flecked with glands that produce the foul odor. (USDA) **Flowers:** Pale blue to lavender, bilaterally symmetrical flowers in long clusters. Flowers are slender tubes, 5 to 10 mm long, with five lobes and long colored stamens that arch down and out from the flower. Flowers grow from the leaf axils along one side of the top of the unbranched stems. (USDA) Vinegar weed is an important pollen source, recognized by pollination ecologists as attracting large numbers of

	native bees and other insects. Its pungent odor make it unattractive to cattle and other grazing animals (LBJ Wildflower Center 2007) **Seeds:** Four small nutlets that are joined at the base. (USDA)

PROPAGATION DETAILS

Note: The research revealed very little propagation information on *Trichostema lanceolatum* Benth. However, propagation details were found for a similar species in the same genus, the sweeter-smelling, *Trichostema lanatum.* Since both species are native to similar climates, some propagation details will be provided for *Trichostema lanatum* until propagation details on *Trichostema lanceolatum* Benth. can be found. It should also be noted that unlike *T. lanceolatum, T.lanatum* does not occur north of California.)

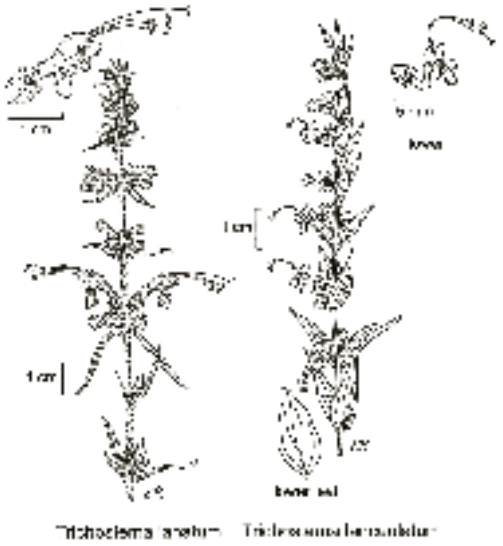


Photo credits: The Jepson Manual

Ecotype	N/A
Propagation Goal	Plants
Propagation Method (*T.lanatum)*	Seed. This method is much more difficult method than propagation from cuttings, with only a small percentage of viable seeds in each lot. (Schmidt 1980)
Product Type	Containers
Stock Type	Information not available
Time to Grow	Information not available
Target Specifications (*T.lanatum)*	Young plants can be transplanted to successively larger pots until they are judged to be sturdy enough for outplanting. (Smith 2006).
Propagule Collection Instructions (*T.lanceolatum)*	Collect seeds in late fall. Plant immediately or store seeds. If storing, first dry seeds by placing in a sunny, well-ventilated location. Store collected seeds in airtight container in cool, dark place. (USDA)
Propagule Processing/Propagule Characteristics (*T.lanatum)*	Separate small nutlets that develop at the base of each flower to obtain seeds. (Smith, 2006). Average number of live seed per pound = 126,400 (S&S Seeds 2016).
Pre-Planting Propagule Treatments (*T.lanatum)*	Keeley and Fotheringham (1998) reported that *T. lanatum* would not germinate without year-long soil contact **and** smoke treatment, which resulted in only a 30% germination rate. (Dunn and Lindstrom 2008).

	Thickness and density of the seed coat makes it more difficult to absorb water. Hot water or hydrogen peroxide soak should yield better results (Smith 2006). Other recommendations include 2 mos. stratification or 3 mos. stratification at 32 degrees F if using old stored seeds. (California Native Plant Society 2016).
Growing Area Preparation / Annual Practices for Perennial Crops (*T.lanceolatum)*	Sow sees in late fall or early spring. Prepare a seedbed that receives full sun and is well-drained. (USDA) Well-drained soil is critical in order to avoid damping-off. (Smith 2006). A satisfactory seeding and potting mix would be leaf mold and sand with a layer of sphagnum moss. Lightly rake seeds into the prepared bed then cover with perlite. (Schmidt 1980).
Establishment Phase Details (*T.lanceolatum)*	If sowing in the spring, gently sprinkle sown bed with water and keep lightly moist until seedlings are established. Once seeds are established, they are very drought resistant and will not tolerate frequent watering (USDA)
Length of Establishment Phase	Information not available
Active Growth Phase (*T.lanceolatum)*	Vigorous growth occurs between July and September, the hottest driest parts of the year. (Heisey and Delwiche 1985).
Length of Active Growth Phase	Information not available
Hardening Phase	Information not available
Length of Hardening Phase	Information not available
Harvesting, Storage and Shipping	Information not available
Length of Storage	Information not available
Guidelines for Outplanting / Performance on Typical Sites (*T.lanatum)*	*T.lanatum* has been cultivated in botanic and home gardens for years, known for its long flowering season. Flowering and fruiting begin after the first full year of growth. Average life span of the plant is four to eight years, but less so if planted in heavy clay soils with little drainage or if plant is over-watered. (Schmidt 1980).
Other Comments	
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method (*T.lanatum)*	Cuttings (more successful method than seeds and provides a means for propagating desirable clones)
Product Type	Just-matured shoots (Smith 2006).
Stock Type	
Time to Grow	N/A
Target Specifications	N/A
Propagule Collection Instructions	Choose more slender, less pithy side shoots, if possible,

(*T.lanatum)*	with three-to four-nodes per cutting. Basal node should be "firm to the touch and the tip well beyond the "squishy" stage." If cuttings are too soft, they will tend to collapse, and overly hard cuttings will root slowly or not at all (Smith 2006).
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments (*T.lanatum)*	Apply mild rooting hormone to base of cutting (Smith 2006).
Growing Area Preparation / Annual Practices for Perennial Crops (*T.lanatum)*	Insert treated cutting into moist sand or perlite and place in a shady, wind-protected site. Sprinkle with water just often enough to prevent wilting (Smith 2006).
Establishment Phase Details (*T.lanatum)*	Once rooted, plant will grow fast, often ready for the open landscape within a few months. (Smith 2006).
Length of Establishment Phase (*T.lanatum)*	Often a few months (Smith 2006).
Active Growth Phase (*T.lanceolatum)*	Vigorous growth occurs between July and September, the hottest driest parts of the year. (Heisey and Delwiche 1985).
Length of Active Growth Phase	Information not available
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Other Comments	
INFORMATION SOURCES	
References	(See References below)
Other Sources Consulted	(See Other Sources below)
Protocol Author	Stephanie Farrell
Date Protocol Created or Updated	May 14, 2016

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