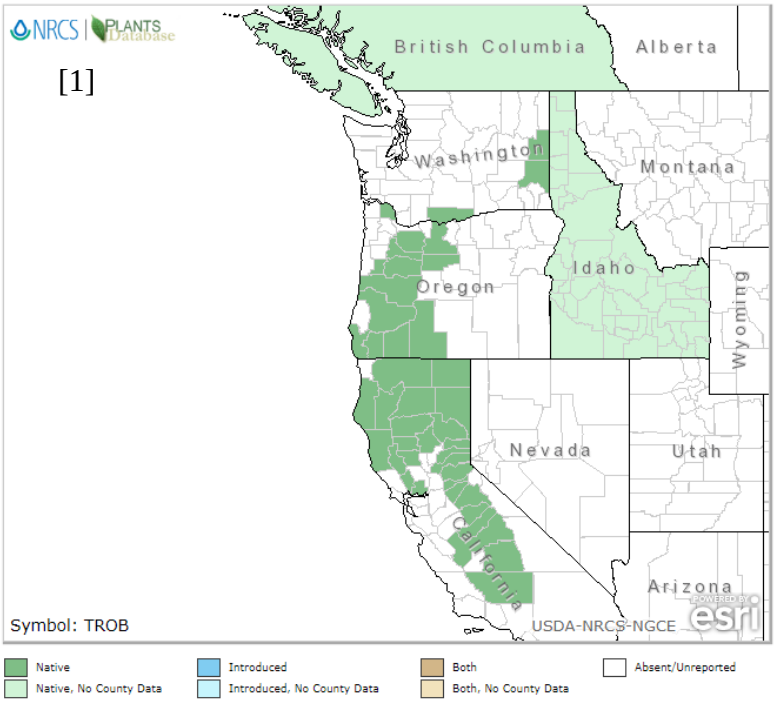
Plant Propagation Protocol for *Trichostema oblongum* Benth.
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/TROB.*pdf*


[3]


[9]


[5]

TAXONOMY	
Plant Family	
Scientific Name	Lamiaceae [1]
Common Name	Mint family [2]
Species Scientific Name	
Scientific Name	*Trichostema oblongum* Benth. [1]
Varieties	None [1, 3, 4]
Sub-species	None [1, 3, 4]
Cultivar	None [1, 3, 4]
Common Synonym(s)	None [1, 3, 4]
Common Name(s)	Oblong bluecurls, Mountain bluecurls [1, 3, 4, 5]

Species Code (as per USDA Plants database)	TROB [1]
GENERAL INFORMATION	
Geographical range	Confined to Western North America [1, 3, 4, 6]. Found as far south as Kern County, CA [1, 5, 7]; and as far north as Castlegar, B.C [6, 8]. In WA, only found east of the Cascades [1, 3, 9]. [1] 
Ecological distribution	Commonly found along dry margins of vernally moist meadows, streambanks, and forest openings, often on disturbed and/or alkaline soils [3, 4, 5, 6, 9]
Climate and elevation range	Grows in vernally moist arid regions, at elevations of 100–3,000 meters (330–9,840 ft); confined to 600-730 meters (1,950-2,400 ft) in Washington [3, 4, 5, 6, 9]
Local habitat and abundance	Somewhat common in northern CA, the Willamette Valley of OR, and along the eastern slopes of the Sierra Nevada [1, 4, 5, 7]. Rare in WA, ID, & B.C. [1, 3, 6, 8, 9] In CA and OR, often associated with forest clearings in Yellow pine forests, Red Fir Forests, Lodgepole pine Forests, Subalpine Forests, California mixed evergreen forests, and North Coastal Coniferous Forests [5, 7]

	In WA, often associated with *Navarettia intertexta, Deschampsia danthonioides, Agrostis interrupta, Madia minima, Juncus bufonius, Juncus tiehmii, Orthocarpus tenuifolius, Trifolium variegatum, Mimulus brevifolius, Epilobium minutum,* and *Artemesia tridentate* [9].
Plant strategy type / successional stage	Stress-tolerator (summer droughts and alkaline soils) [5, 6, 9] Weedy/colonizer (often found on disturbed soils) [3, 6]
Plant characteristics	Forb (herbaceous), Annual [1, 3, 4, 6] Taprooted, simple or branched herb with maximum height of 50 cm. Leaves opposite, entire, and elliptical. Heavily pubescent (stems, leaves, & flowers) and strongly aromatic (especially leaves). Violet flowers borne on compact, one-sided, axillary cymes. Bottom corolla lobe significantly longer and lighter in color than the other four. Stamens (four) exerted and curved. Fertilized flowers give rise to four-nutlet fruits typical of Lamiaceae. [3, 4, 6, 9]

PROPAGATION DETAILS

**************************************Note**************************************

An extensive search yielded no propagation information for *Trichostema oblongum*. However, propagation information is more readily available for two closely related species, *Trichostema ovatum* and *Trichostema lanatum*, and the applicable portions of their propagation procedures will be provided below.

The information pertaining to *T. ovatum* is more relevant than the information pertaining *T. lanatum*, as *T. ovatum* is more similar to *T. oblongum* in terms of growth habit and ecology than *T. lanatum* is [5, 10, 11, 12]. For instance, both *T. oblongum* and *T. ovatum* are annual forbs often found on disturbed and/or alkali soils in regions that are vernally moist [5, 11], while *T. lanatum* is a perennial shrub/subshrub most often found on disturbed but well-draining, slightly acidic to slightly basic soils in regions that receive little rainfall [12, 13, 14]. Information regarding *T. lanatum* is still included in the following section because it is a more popularly cultivated species than *T. ovatum*, and there is consequently more information available regarding its propagation [10-15] . With these differences in mind, all information in the following section is clearly marked via reference number as being more pertinent to either *T. ovatum* or *T. lanatum* (consult list of references at the end of the protocol). It must also be noted that unlike *T. oblongum*, both *T. ovatum* and *T. lanatum* are endemic to southern California [5, 11, 12].

Ecotype	Information not available
Propagation Goal	Seed [15]
Propagation Method	Seed [14, 15, 16, 17]
Product Type	Dried seed [15, 18]
Stock Type	Seed/coin envelope [18]
Time to Grow	8 to 9 months [15]
Target Specifications	Mature seeds [15]
Propagule Collection Instructions	Mature seeds can typically be collected from September through October. Mature four-nutlet fruits can be identified by their dark brown/gray color. Seeds are most efficiently gathered by collecting entire branches that contain mature fruits. This can usually be accomplished by hand (no tools necessary) [15]. Since *T. oblongum* is usually unbranched, this often means collecting the entire individual [3, 4, 5]. In individuals that are branched, seeds on different branches may be in different stages of maturity, and if this appears to be the case (based on fruit color), then the mature fruit- bearing branches may be broken off, leaving the rest of the seeds on the plant to mature [15]. Regardless of branch number, different individuals within a population are bound to mature at different rates, so collection of seeds on multiple dates is advisable [15, 18].
Propagule Processing/Propagule Characteristics	First, air-dry collected materials by laying them on tarps in a single layer [15] For large scale projects, fruit-bearing stems can be pulverized into a seed and debris mixture using a hammer mill, and seed can then be separator from debris using a grain cleaner. An air separator can then be used to separate any remaining small debris from the seeds [15]. For small scale projects, rub collected materials against differently sized sieves until only seeds and small debris remain, and then use a fan for winnowing until the seeds are isolated [15, 18]. Seed density and seed longevity are unknown.
Pre-Planting Propagule Treatments	Unclear – some sources suggest either a 2 to 3 month cold, moist stratification period or fall sowing in November for natural stratification [12, 15], while other sources suggest direct sowing in February [15, 16].
Growing Area Preparation / Annual Practices for Perennial Crops	Raised or mounded planting beds are well-suited for annual seed production [15]. Well-draining soil is preferable, and a neutral to high pH (7.0-8.5) is best [3, 9, 11, 14, 15]. Furthermore, *Trichostema* are weedy species that tend to thrive in nutrient-poor soils, so no compost or fertilizer is necessary (this will also help with drainage) [3, 9, 11, 14, 15, 16, 17, 19, 20].

Establishment Phase Details	Maintaining soil moisture is essential during the establishment phase of *Trichostema* [3, 4, 5, 15]. If late winter and spring rainfall are not sufficient, supplement with irrigation [15]. Germination rates for *Trichostema* are generally low, and will be even lower if soil moisture is not maintained [17].
Length of Establishment Phase	1 to 3 months (germination is not uniform) [15, 17]
Active Growth Phase	*T. oblong* is drought tolerant and quite sensitive to overwatering [14, 19, 20]. Over-watering and over-fertilizing are the two most common cultural mishaps with *Trichostema* species [9, 11, 14, 15, 16, 17, 19, 20] In California, *Trichostema* are often considered to be particularly "fussy" plants, but experienced growers insist that "neglect" is the key to success for these weedy plants [14, 17, 20].
Length of Active Growth Phase	5 to 8 months [15]
Hardening Phase	Not applicable; *T. oblongum* is an annual [1, 3, 4, 5].
Length of Hardening Phase	Not applicable; *T. oblongum* is an annual [1, 3, 4, 5].
Harvesting, Storage and Shipping	As aforementioned, mature seeds can typically be collected from September through October. Mature four-nutlet fruits can be identified by their dark brown/gray color. Seeds are most efficiently gathered by collecting entire branches that contain mature fruits. This can usually be accomplished by hand (no tools necessary) [15]. Since *T. oblongum* is usually unbranched, this often means collecting the entire individual [3, 4, 5]. In individuals that are branched, seeds on different branches may be in different stages of maturity, and if this appears to be the case (based on fruit color), then the mature fruit- bearing branches may be broken off, leaving the rest of the seeds on the plant to mature [15]. Regardless of branch number, different individuals within a population are bound to mature at different rates, so collection of seeds on multiple dates is advisable [15, 18]. Dried seeds should be stored under cool, dry conditions [18]. A low cost example of a system that provides these conditions would be storing seeds in a refrigerator within sealed containers with silica gel packets for humidity control [18]. In terms of shipping, seeds are generally small enough that they can be economically shipped via standard shipping and mailing agencies, such as USPS [18]. The relatively short interruption of cool, dry storage conditions is usually not harmful to the viability of the seeds [18].

Length of Storage	Seed longevity is unknown
Guidelines for Outplanting / Performance on Typical Sites	Seed germination for *Trichostema* is typically low, so customers should keep this in mind while ordering [17]. *T. oblongum* should be planted in November if fall-sown and in February if spring-sown [12, 15, 16]. Germination usually occurs within March, April, and May; and peak flowering usually occurs from June to early September [5, 15]. Supplemental late winter and spring irrigation may be required if rainfall is unusually low, as soil moisture content is critical to successful germination for this species [3, 9, 15]
Other Comments	Conservation Status of *Trichostema oblongum*: Global Rank: G5 (Secure) [21] WA State Rank: S1 (More fieldwork is needed to assess its rarity and security) [21] B.C. Rank: Red Listed (At risk of being extirpated) [6]
INFORMATION SOURCES	
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Date Protocol Created or Updated	04/20/2019