Plant Propagation Protocol for *Angelica tomentosa*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2023/ANTO

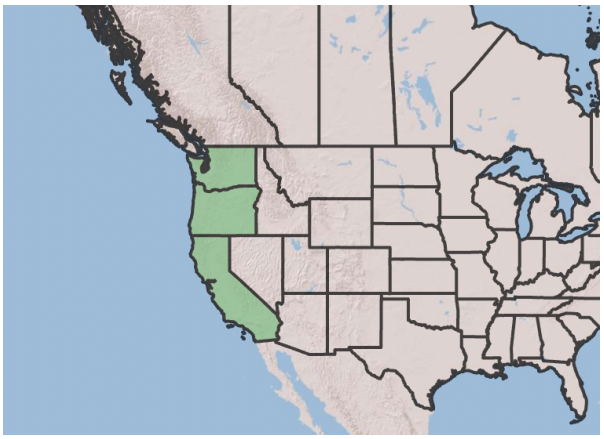

Figure 1. Geographical distribution in United States.[1]

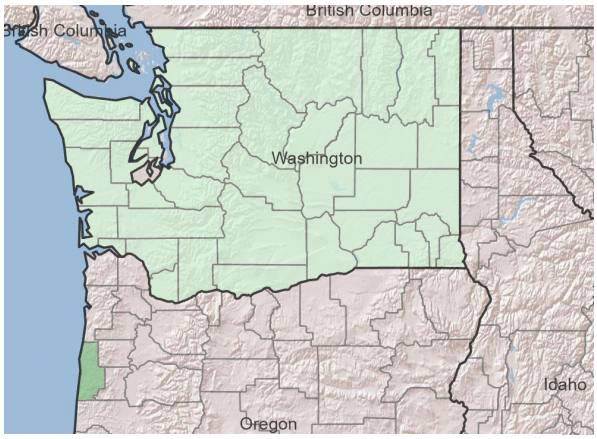

Figure 2. Geographical distribution Washington and Oregon.[1]

Figure 3. *Angelica tomentosa* flowers.[2]

Figure 4. *Angelica tomentosa* leaves.[2]

TAXONOMY[1]	
Plant Family	
Scientific Name	Apiaceae
Common Name	Umbellifer family, Carrot family
Species Scientific Name	
Scientific Name	*Angelica tomentosa* S. Watson
Varieties	*Angelica tomentosa* S. Watson var. *hendersonii* (J.M. Coult. & Rose) Di Tomaso *Angelica tomentosa* S. Watson var. *californica* (Jeps.) Jeps. *Angelica tomentosa* var. *tomentosa* S. Watson

	These varieties are listed as synonyms for *Angelica hendersonii, Angelica californica,* and *Angelica tomentosa,*[3-5] respectively, but are not listed in the USDA PLANTS database under *Angelica tomentosa*.
Sub-species	None listed.
Cultivar	None listed.
Common Synonym(s)	None found.
Common Name(s)	Woolly Angelica, Henderson's Angelica, Sea Coast Angelica,[6] California Angelica.[7]
Species Code (as per USDA Plants database)	ANTO
GENERAL INFORMATION	
Geographical range	Native to the continental United States. Specifically found in Washington, Oregon, and California.[1]
Ecological distribution	Wooded, riparian areas and stream banks, coastal mountain ranges.[7]
Climate and elevation range	Occurs at elevations of 30-2400 m.[2]
Local habitat and abundance	Occasional abundance but locally common in California.[7] Globally ranked apparently secure/secure.[8] Best in full sun to partial shade in moderately acidic to neutral soils (pH 5.6-7.3). Recommended in hardiness zone 9b but acceptable in zone 8a.[9]
Plant strategy type / successional stage	Not found.
Plant characteristics	Perennial forb/herb that flowers June-August. Leaves have a diameter of less than 1 m. They are triangular-ovate shaped with a 2-3 ternate-pinnate formation. Leaflets are 2-12 cm in length.[2] Plant can grow up to 6.5' tall and is glaucous in color. Flowers can be white, red, pink, or purple. Fruit is 6-10 mm and classified as schizocarp.[10] Inflorescence in bracts with 20-60 rays and webbed pedicels at base. All parts of the plant can be glabrous to hairy.[2] Taprooted and salt tolerant.[9]
PROPAGATION DETAILS[11]	
Ecotype	Propagation of *Angelica hendersonii,* also known as *Angelica tomentosa* S. Watson var. *hendersonii* (J.M. Coult. & Rose) Di Tomaso in California. [Other methods used in Oregon are indicated in brackets.]
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)

Stock Type	Deepot 40 [stubby containers[12]]
Time to Grow	N/A
Target Specifications	Firm plug in container. [Well-developed crowns, roots, and rhizomes filling soil profile.[12]]
Propagule Collection Instructions	Seeds should be collected between June 20 and November 15. Mature inflorescences and seeds are brown in color.
Propagule Processing/Propagule Characteristics	Seeds should be kept dry and cool. Seeds do not need to be cleaned.
Pre-Planting Propagule Treatments	Soak seeds in water overnight. Cold stratify seeds in peat moss for two weeks or until seeds germinate. [Stratification defined as warm (75 degrees F) treatment followed by a cold (35 degree 5) treatment for 90 days. Germination did not occur when seeds were cold stratified with no warm stratification.[12]]
Growing Area Preparation / Annual Practices for Perennial Crops	Growth occurs in a fully controlled greenhouse. Four grams of seeds should be shown per flat with Sunshine Mix #4 Aggregate Plus (peat moss, perlite, major and minor nutrients, gypsum, and dolomitic lime). Seeds are mixed in the media to sow. Flats are water with an automatic irrigation system. Seeds sown on July 1 showed a 50% germination rate.
Establishment Phase Details	Germination occurs 14 days after sowing. Seeds should be transplanted another 14 days after germination to individual containers (Deepot 16) that contains a standard potting mix (peat moss, fir bark, perlite, sand). The transplant survival rate for this method was 75%.
Length of Establishment Phase	1 month.
Active Growth Phase	Seeds are fertilized with Nutricote (NPK 13-13-13) three months after transplant. Leaves should be cut back if too large.
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	N/A
INFORMATION SOURCES	
References	
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Protocol Author	Hunter Wade
Date Protocol Created or Updated	05/23/23

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