


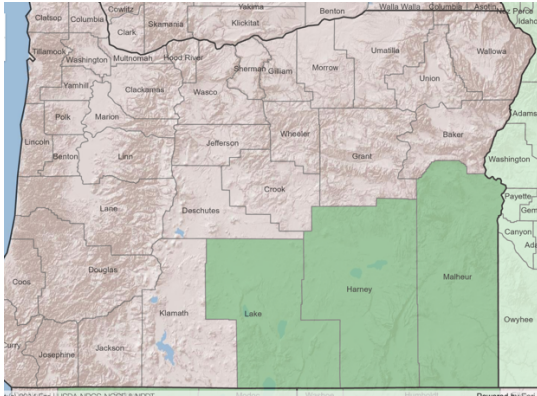
Plant Propagation Protocol for *Downingia Insignis*
ESRM 412 – Native Plant Production



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TAXONOMY	
Plant Family	
Scientific Name	Campanulaceae
Common Name	Bellflower
Species Scientific Name	
Scientific Name	<i>Downingia insignis</i> Greene
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	<i>Bolelia insignis</i> Greene (KEW, 2000)
Common Name(s)	Harlequin calicoflower, cupped downingia
Species Code (as per USDA Plants database)	DOIN

GENERAL INFORMATION

<p>Geographical range</p>	<p>North America native regions:</p>  <p>Image courtesy of Wildflowersearch.org</p>  <p>County level data for Eastern Oregon. Photo courtesy of USDA. Copyright:(c) 2014 Esri</p>
<p>Ecological distribution</p>	<p>Vernal pools, lake and stream margins, roadside ditches (Wildflower, 2021).</p>
<p>Climate and elevation range</p>	<p>0 – 1670 m (Calflora).</p>
<p>Local habitat and abundance</p>	<p>Wetlands preferred. Often found in communities with sagebrush scrub, valley grassland, and in wetland-riparian areas (Calflora).</p>
<p>Plant strategy type / successional stage</p>	<p>Tolerance to disturbance (Nature Serve Explorer, 2022).</p>
<p>Plant characteristics</p>	<p>Annual forb. Flowering time is March – May (Schultheis, 2012).</p>
<h3>PROPAGATION DETAILS</h3>	
<p>Propagation Goal</p>	<p>Seed</p>
<p>Propagation Method</p>	<p>Seed</p>
<p>Product Type</p>	<p>Container (plug), propagules</p>
<p>Stock Type</p>	<p>Plugs</p>
<p>Time to Grow</p>	<p>3-4 months (Bartow, 2007).</p>
<p>Target Specifications</p>	<p>Grow plugs to be transplanted (Barstow, 2007).</p>
<p>Propagule Collection Instructions</p>	<p>Pod collection possible with weed fabric. Allow pods to split and drop seed. Thresh seeds and remove weed fabric (Barstow, 2007).</p>

	Seeds will ripen during late July or August (USDA). For small scale collection, dead plants can be cut at the base and collected, and any remaining seeds can be swept up and dried for collection (USDA).
Propagule Processing/Propagule Characteristics	Seed weight for <i>Downingia insignis</i> is unavailable. The USDA reports 4,000,000 seeds per pound for <i>Downingia Elegans</i> , a species with similar propagation requirements (Native Seed Production Manual).
Pre-Planting Propagule Treatments	Clean seeds from debris using an air-screen machine (USDA).
Growing Area Preparation / Annual Practices for Perennial Crops	Information not available for <i>Downingia insignis</i> . Information based on propagation of <i>Downingia elegans</i> and <i>Downingia yina</i> , species that have similar growth requirements. Sow seeds into cone shaped containers with a peat based media. Soil-less media is preferred. Include micronutrients and slow release fertilizer for best success (Barstow, 2007). Seeds will germinate in both warm or cold temperatures, (Barstow 2007), however extreme temperatures should be avoided. The USDA reports success for a similar species, <i>Downingia Elegans</i> , when seeds are sown in late winter (USDA).
Establishment Phase Details	Germinates best in warm nursery temperatures, during the April season.
Length of Establishment Phase	No information available.
Active Growth Phase	No information available.
Length of Active Growth Phase	No information available.
Hardening Phase	No information available.
Length of Hardening Phase	No information available.
Harvesting, Storage and Shipping	No information available for the harvesting, storage, and shipping after growth phases before outplanting.
Length of Storage	Seedlings will be ready for immediate outplanting. No information available on storage length.
Guidelines for Outplanting / Performance on Typical Sites	Annual is likely to produce around 16-30 pounds per 1/10 th acre plot according to the USDA results for <i>Downingia Elegans</i> , a closely related species with similar propagation and outplanting requirements (USDA). No size guidelines available.
Other Comments	Use caution when crushing <i>Downingia</i> plant material to avoid exposure to silica, a known respiratory irritant (USDA).
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	Abbey Lehn

Date Protocol Created or Updated	05/04/2022
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