

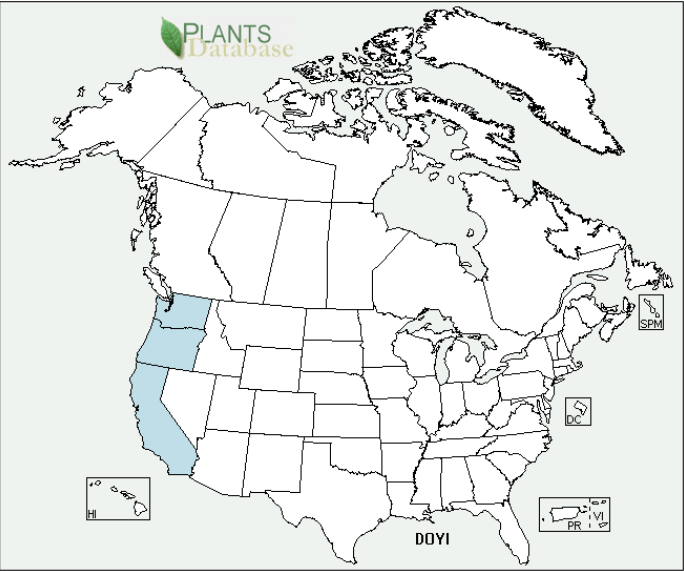
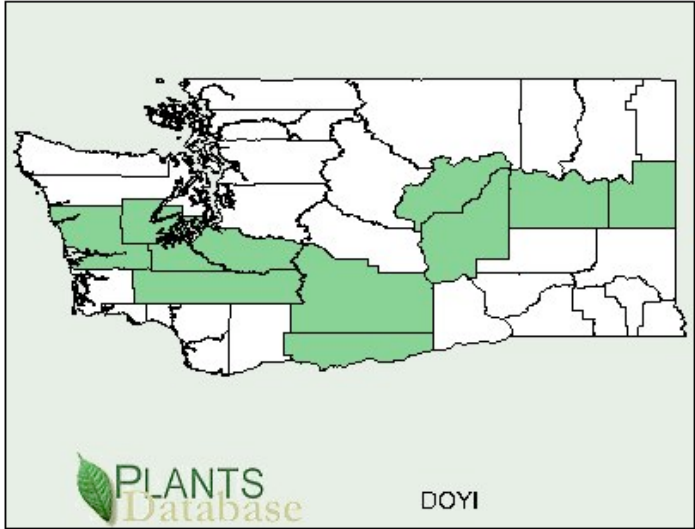
Plant Propagation Protocol for *Downingia yina*
 ESRM 412 – Native Plant Production



Image courtesy of Donald Myrick © California Academy of Sciences

TAXONOMY	
Family Names	
Family Scientific Name:	<i>Campanulaceae</i>
Family Common Name:	Bellflower
Scientific Names	
Genus:	<i>Downingia</i>
Species:	<i>yina</i>
Species Authority:	Elmer Ivan Applegate
Common Synonym(s):	<i>Downingia willamettensis</i> M. Peck, <i>Downingia yina</i> Applegate var. <i>major</i> McVaugh
Common Name(s):	Cascade Calicoflower
Species Code (as per USDA Plants database):	DOYI

GENERAL INFORMATION

<p>Geographical range:</p>	<p>North American Distribution:</p>  <p>Washington State Distribution:</p>  <p>Images courtesy of USDA Plants Database</p>
<p>Ecological distribution:</p>	<p>Marsh, wet meadow and pond edge ecosystems (Hitchcock, et al, 1984); Vernal pools (Quinn & Feldmann 2004)</p>
<p>Climate and elevation range</p>	<p>0 – 1,659 meters (Calflora 2010)</p>
<p>Local habitat and abundance; may include commonly associated species</p>	<p>Prefers wet systems, commonly found in association with <i>Eryngium petiolatum</i> (rushleaf eryngo), <i>Agrostic alba</i> (bentgrass), and in Douglas County, OR it is found with <i>Plagiobothrys hirtus</i> (rough popcorn flower), which is on the Endangered Species list (Millman & Brown 1997)</p>
<p>Plant strategy type / successional stage:</p>	<p>Flowers in late spring and early summer (Hitchcock 1984).</p>

Plant characteristics:	Life form: forb; annual; stems are 20-40 cm long; leaves are alternate and narrowly lanceolate, up to 2 ½ cm long, not serrate; flowers are bluish/purple with white and yellow details, 5-petaled with lower three petals larger than the upper two petals (Quinn & Feldmann 2004).
PROPAGATION DETAILS	
Propagation Goal:	Plants, Seeds
Propagation Method:	Seed
Product Type:	Container (plug)
Stock Type:	Plugs
Time to Grow:	Three months (Bartow 2007).
Target Specifications:	20-40 cm tall (Morin & Ayers 1993), many seeds per plant (Bartow 2007).
Propagule Collection:	Can collect pods (open or closed) on weed fabric. May vacuum weed fabric to collect seeds from opened pods (Barstow 2007). If seeds do not drop their seed before the plants die, whole or partial plants can be cut and cleaned mechanically (see Propagule Treatments below) (Barstow 2007).
Propagule Processing/Propagule Characteristics:	Seed weight is unavailable for this species, but similar species within the same genus (<i>D. laeta</i> and <i>D. bicornuta</i>) are listed as having 250,000 seeds/lb (USDA 2010)
Pre-Planting Propagule Treatments:	After collection, dry plants can be processed in large brush machines with small mesh screen then air-cleaned to remove chaff (Bartow 2007).
Growing Area Preparation / Annual Practices for Perennial Crops:	The Corvallis Plant Materials Center had luck directly sowing seeds in stubby cone-tainers. They used a peat-based growing medium with added micronutrients and slow-release fertilizer. Their trials showed that germination was best accomplished in an unheated greenhouse of about 40°-50°F during the day and 35°-40°F at night (Bartow 2007). The USDA Plants Database does not have propagation information for <i>D. yina</i> , but another species in the genus, <i>D. bicornute</i> (doublehorn calicoflower) is adapted to fine and medium textured soils, does not require cold stratification, has low drought tolerance, and is intolerant of shade (USDA 2010). Because these species are very closely related, it is likely that <i>D. yina</i> grows well in similar conditions, but a trial run should be established to determine success.
Establishment Phase (from seeding to germination):	Germination can take place in warm or cold conditions (Bartow 2007). The Corvallis Plant Materials Center sowed their seeds in December.

Active Growth Phase (from germination until plants are no longer actively growing):	If seeds are sowed in December they will be ready to transplant outside by mid-March (Bartow 2007).
Length of Active Growth Phase:	Approximately three months (Bartow 2007).
Hardening Phase:	N/A
Length of Hardening Phase:	N/A
Harvesting, Storage and Shipping:	No information is available.
Length of Storage:	No information is available.
Guidelines for Outplanting / Performance on Typical	No information is available.
Protocol Author:	Brooke A. Cassell
Date Protocol Created or Updated (MM/DD/YY):	05/09/2010

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Images:

- Myrick, D. (Photographer). (1999). *Downingia yina; cascade downingia*. [Web]. Retrieved from http://calphotos.berkeley.edu/cgi/img_query?enlarge=8253+3202+3489+0002

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