

Plant Propagation Protocol for *Lupinus arbustus*

ESRM 412 – Native Plant Production

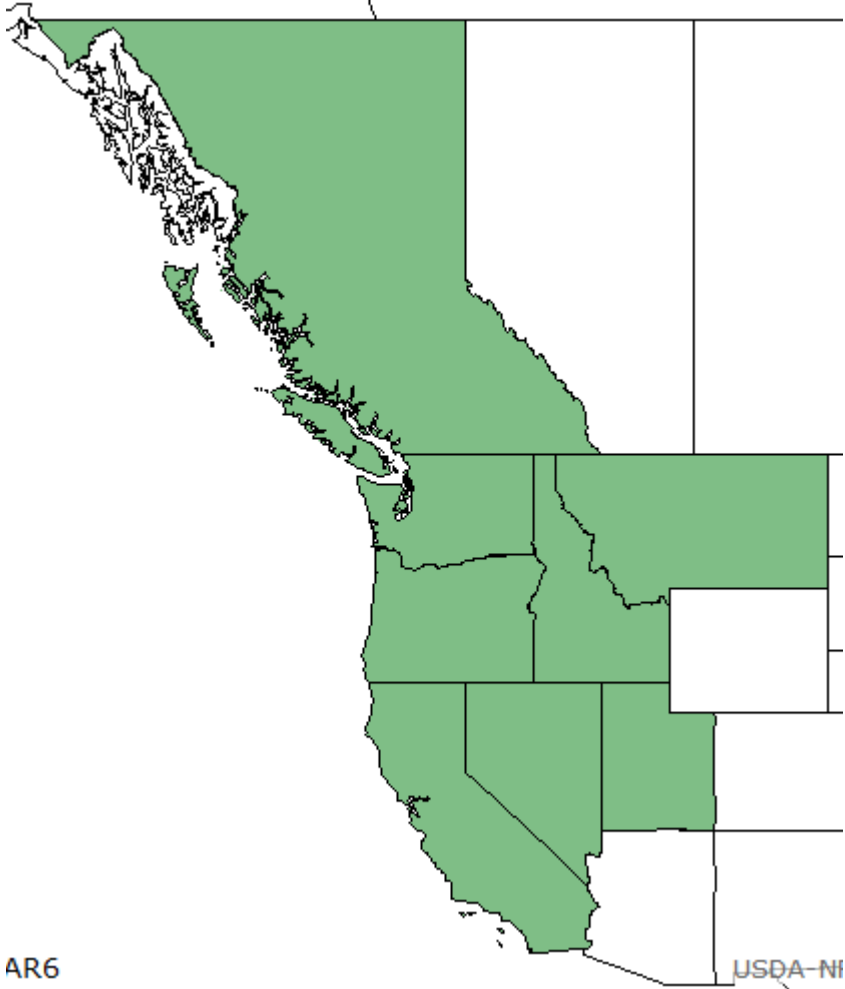
Protocol URL: <https://courses.washington.edu/esrm412/protocols/LUAR6.pdf>

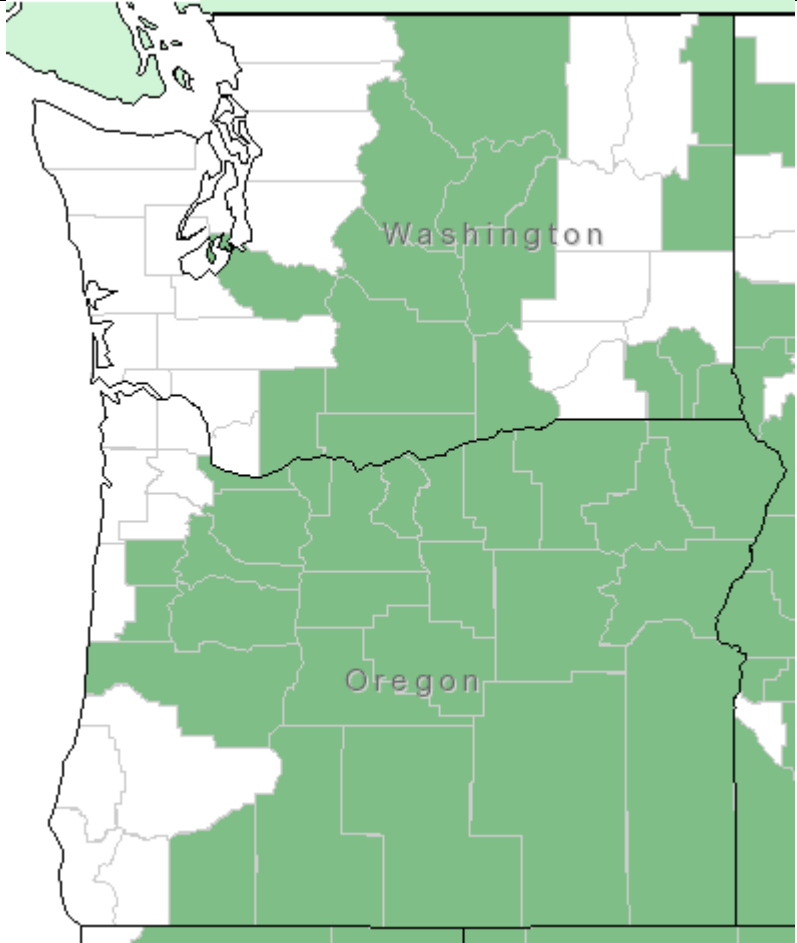


Image Credit: Barry Breckling

TAXONOMY

Plant Family	
Scientific Name	Fabaceae
Common Name	pea
Species Scientific Name	
Scientific Name	<i>Lupinus arbustus</i> Douglas ex Lindl.
Varieties	<i>arbustus</i> <i>montanus</i> (Howell) D. Dunn ¹
Sub-species	<i>arbustus</i> <i>calcaratus</i> (Kellogg) D. Dunn <i>neolaxiflorus</i> D. Dunn <i>pseudoparviflorus</i> (Rydb.) D. Dunn <i>silvicola</i> (A. Heller) D. Dunn ¹

Cultivar	
Common Synonym(s)	
Common Name(s)	longspur lupine, long-spurred lupine ²
Species Code (as per USDA Plants database)	LUAR6
GENERAL INFORMATION	
Geographical range	 <p>AR6</p> <p>Image credit: USDA Plants Database</p> <p>USDA-NI</p>

	 <p>Image Credit: USDA Plant Database</p>
Ecological distribution	Open sagebrush scrub or mixed conifer forest at upper elevations. ⁷ Commonly found in the Cascade, Sierra Nevada, and Rocky mountain ranges in Washington, Oregon, California, Idaho, Nevada, Montana, and Utah. ¹
Climate and elevation range	Elevation: 4100-9680ft ³ Annual Precipitation: 6.5-109in ² Temperature Range: December low: 14°F July high: 87 °F ³
Local habitat and abundance	
Plant strategy type / successional stage	Early colonizer ⁴
Plant characteristics	Forb <i>L. arbustus</i> is a perennial forb that grows up to 28in tall. It has palmate leaves comprised of 7 to 13 leaflets up to 2.75in long. Flower clusters may be up to 7in long, containing 0.5in flowers of varying color gradients from white to yellow and purple to pink. ⁸
PROPAGATION DETAILS	
Ecotype	Various biotypes from Utah and Nevada
Propagation Goal	Plants

Propagation Method	Seed
Product Type	Container (plug)
Stock Type	Plug
Time to Grow	12 weeks
Target Specifications	Plug ready for outplanting with 4 or more leaves.
Propagule Collection Instructions	Seed pods should be harvested while still green. As pods ripen they will shift to a transparent yellow color. When individual seeds can be identified, pods are ripe for seed harvest. After harvest seeds should be dried. ⁵
Propagule Processing/Propagule Characteristics	16196 seeds per pound 100% viability after drying. ⁶
Pre-Planting Propagule Treatments	Fresh seed require no treatment. ² Seeds should be moistened and inoculated with rhizobia and mycorrhizae prior to sowing. ⁵
Growing Area Preparation / Annual Practices for Perennial Crops	Greenhouse temperatures should be 65 °F during the day and 50 °F during the night with 12 hours of light. 7.5 cubic inch containers should have some headspace, and media should be saturated with water. Two seeds may be planted per cell. ⁵
Establishment Phase Details	Germination occurs within 4 days. Media should be kept moist. ⁵
Length of Establishment Phase	4 weeks ⁵
Active Growth Phase	Containers should be thinned to 1 plant per container. At 2 week intervals, beginning on week 4, plants should be fertilized with liquid fertilizer containing equal ration N, P, and K. ⁵
Length of Active Growth Phase	8 weeks ⁵
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
INFORMATION SOURCES	
References	¹ USDA. <i>Lupinus arbustus</i> Douglas ex Lindl. <i>Plants Database</i> . ² California Native Plant Society. Spur Lupine. <i>Calscape</i> . [Accessed 5/21/2020; https://calscape.org/Lupinus-arbustus-0] ³ Califlora. <i>Lupinus arbustus</i> Plant Characteristics and Associations. <i>Plant Characteristics and Associations</i> . [Accessed 5/23/20]

	<p>⁴ Jones, C.D., Stettler, J.M., Jensen, S.L., Hopkins, B.G., Jolley, V.D., Turner, D., ... Stevens, M.R. (2018). Comparisons of cultivation methods for <i>Lupinus sericeus</i>, <i>L. argenteus</i>, <i>L. prunophilus</i>, and <i>L. arbustus</i>. <i>Native Plants Journal</i> 19(2), 91-99.</p> <p>⁵ Jensen, Scott L. 2007. Propagation protocol for production of Container (plug) <i>Lupinus arbustus</i> Dougl. ex Lindl. plants 7.5 cu.in. QPlug; USDA FS - Rocky Mountain Research Station, Shrub Sciences Laboratory Provo, Utah.</p> <p>⁶ Kew Royal Botanic Gardens. <i>Seed Information Database</i>. [Accessed 5/24/20; http://data.kew.org/sid/SidServlet?ID=14477&Num=e5W#Literature]</p> <p>⁷ UC Berkley. (1993). Treatment from the Jepson Manual. <i>Jepson Flora Project</i>.</p> <p>⁸ iNaturalist.ca. Spur Lupine. <i>iNaturalist Network</i>. [Accessed 5/26/20; https://inaturalist.ca/taxa/62690-Lupinus-arbustus]</p>
Other Sources Consulted	<p>Love, S.L., & Akins, C.J. (2019). Fourth summary of the native seed germination studies of Norman C Deno: species with names beginning with letters <i>L</i> through <i>O</i>. <i>Native Plants Journal</i> 20(3), 279-304.</p> <p>Teresa Sholars & Rhonda Riggins 2012, <i>Lupinus arbustus</i>, in Jepson Flora Project (eds.) <i>Jepson eFlora</i> University of Texas at Austin. <i>Lupinus arbustus</i> ssp. <i>Calcaratus</i>. <i>Lady Bird Johnson Wildflower Center</i>. [Accessed 5/23/20]</p>
Protocol Author	Thomas Hayashi
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