Plant Propagation Protocol for *Lupinus wyethii*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2024/LUWY.pdf*

Figure 1: © Robert L. Carr 2020 | Burke Herbarium Image Collection[7]

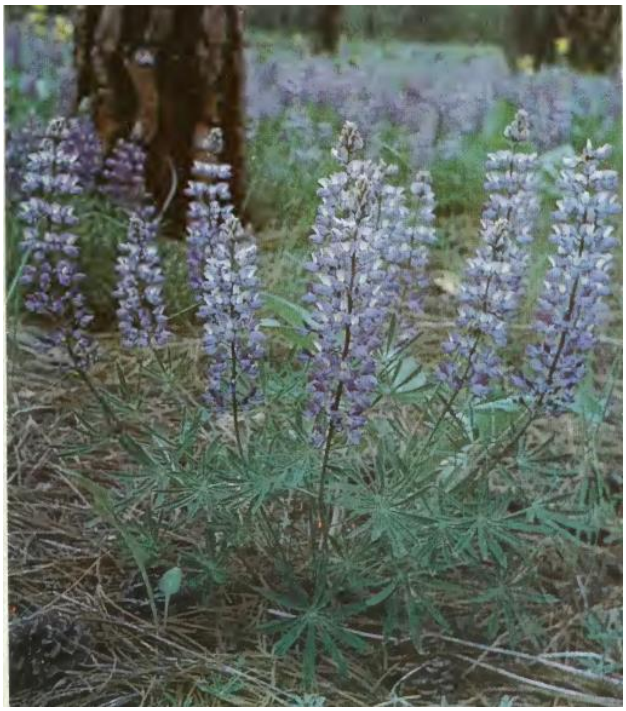
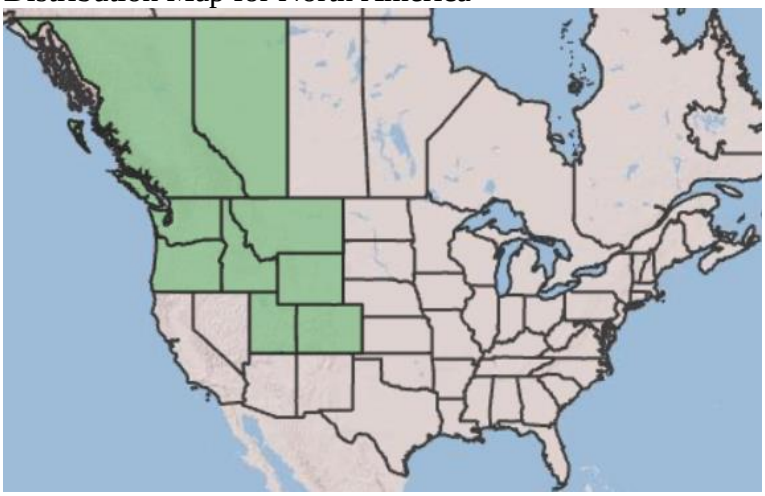
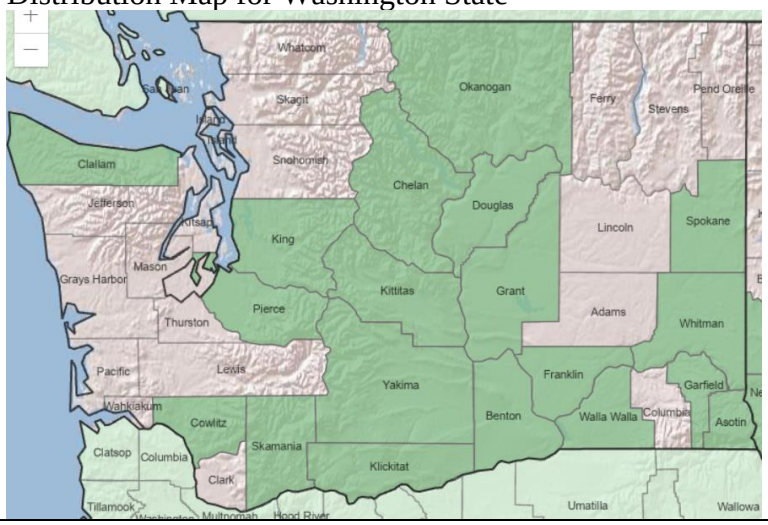


Figure 2: 'The Lupines of Canada and Alaska' (Dunn and Gillett)[6]

TAXONOMY	
Plant Family	
Scientific Name	Fabaceae
Common Name	Pea family
Species Scientific Name	
Scientific Name	*Lupinus wyethii* S. Watson[9, 18]
Varieties	No recognized varieties
Sub-species	*Lupinus wyethii* ssp. 'tetonensis' (E.E. Nelson) B.J. Cox & D.B. Dunn[10, 19] *Lupinus wyethii* ssp. 'wyethii' S. Watson[3, 11, 20]
Cultivar	No recognized cultivars
Common Synonym(s)	*Lupinus wyethi* S. Watson *Lupinus polyphyllus* Lindl. var. 'humicola' (A. Nelson) Barneby[7, 8, 15]
Common Name(s)	Wyeth's lupine
Species Code (as per USDA Plants database)	LUWY

GENERAL INFORMATION	
Geographical range	Distribution Map for North America[17, 21]  Distribution Map for Washington State[17] 
Ecological distribution	Open sites, including shrub steppe deserts, roadsides, moist grassy meadows; wooded, forested sites and thickets.[6, 7, 16, 23]
Climate and elevation range	Sea-level to subalpine[23]
Local habitat and abundance	Similar to large-leaved lupine (*Lupinus polyphyllus)*, Wyeth's lupine can be found in disturbed sites and wet meadows and can be found with other native wildflowers.[23] Species can also tolerate low nutrient soils due to symbiotic relationship with N-fixing bacterium.[4, 14]
Plant strategy type / successional stage	*Lupinus wyethii* is capable of establishing on low-nitrogen soils, and is often an early successional species.[6] Other lupine species are considered invasives outside of the Pacific Northwest.
Plant characteristics	• Perennial, herbaceous[7, 23] • Grows to 12-20 inches tall

	• Basal, alternate, palmately compound leaves with 8-11 lanceolate leaflets; light green to silvery-green[6, 7, 16] • Flowers from May to August (depending on exact locale)[6, 7] • Inflorescence forms whorled or spiraled racemes with many flowers; violet, indigo, or purple petals with yellow spot on banner; 5-6 ovules[5, 6, 26] • Fruits are present as tan, pubescent seed pods (typical of Fabaceae family)[6, 7, 14]
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	Deepot 16
Time to Grow	Weeks to months
Target Specifications	N/A
Propagule Collection Instructions	When seed pods ripen, they pop open and disperse the 3-9 seeds; seed pods can be collected while they are still slightly green and can be dried after removal from plant.[24, 25] If necessary, seed pods can be air-dried in slightly covered containers.[22, 24]
Propagule Processing/Propagule Characteristics	Similar species (*Lupinus polyphyllus*) have a seed density of 19-30,000 seeds per pound.[2] Western Australia lupines have been shown to be capable of overwintering as hard seeds with ~70% incidence.[24]
Pre-Planting Propagule Treatments	Seed pods and detritus can be separated from seeds by screening or threshing.[2, 22] Long-term storage is possible if seeds are properly dried and matured.[24] The hard seed coat typical of legumes will need to be broken if seeds are not planted following collection.[24] Methods to break this seedcoat include mechanical scarification, cold/moist stratification, chemical scarification, and soaking in hot water.[12, 24] • Mechanical scarification can be achieved by using an electric seed scarifier or a rock tumbler with gravel or sand.[12] • Chemical scarification can be achieved by soaking seeds in concentrated sulfuric acid or sodium hypochlorite (bleach) for a period of 30-60 minutes.[12, 24] Seeds can be cleaned by soaking in a warm water bath followed by thorough drying.[4]

Growing Area Preparation / Annual Practices for Perennial Crops	Direct seeding is not recommended, but may be appropriate in large outplanting situations.[2] Soil should be kept at a temperature of at least 8C, and capable of holding sufficient water without suffocating seeds.[4] Slightly acidic soil (pH ~6) can be appropriate.[4] Seeds should be sown in individual plugs at a depth of ½ to ¾ inches.[2]
Establishment Phase Details	Germination on paper towels can occur within 5 days following proper pre-treatment.[13]
Length of Establishment Phase	Days to weeks[1, 12]
Active Growth Phase	Seedlings can be prone to overheating and root-rot.[25] Fertilization must be approached with caution because excess nitrogen in the soil can inhibit the N-fixation in the roots from *rhizobium* bacteria.[4]
Length of Active Growth Phase	Months[4]
Hardening Phase	No information found.
Length of Hardening Phase	One growing season; *Lupinus wyethii* is a perennial that persists for several years and has adapted to overwintering.[6]
Harvesting, Storage and Shipping	Similar species *Lupinus polyphyllus* typically do not flower during their first growing season especially if started in late spring; *Lupinus sp.* usually do flower during the second growing season.[2]
Length of Storage	Dried seeds stored at room temperature can remain viable for 30+ years.[24]
Guidelines for Outplanting / Performance on Typical Sites	No information found regarding nursery propagation. Direct seeding for similar species has shown variable outcomes, dependent on seed collection location, pre-planting treatments, and other factors.[22]
Other Comments	*Lupinus wyethii* has not had as much research focus as other *Lupinus* species. Thus, there is not much information available for nursery or outplanting protocols. *Lupinus wyethii* is a nitrogen-fixer and does well on disturbed sites so it can be appropriate in a variety of restoration sites.[2, 23]
INFORMATION SOURCES	
References	See attached appendix
Other Sources Consulted	N/A
Protocol Author	Nova Moss Ravenscroft
Date Protocol Created or Updated	05/01/24

Appendix: References

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