

Plant Propagation Protocol for Northern water horehound (*Lycopus uniflorus*)

ESRM 412 – Native Plant Production

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



(Image from Mohlenbrock 1992)



(Image by Jose Hernandez)

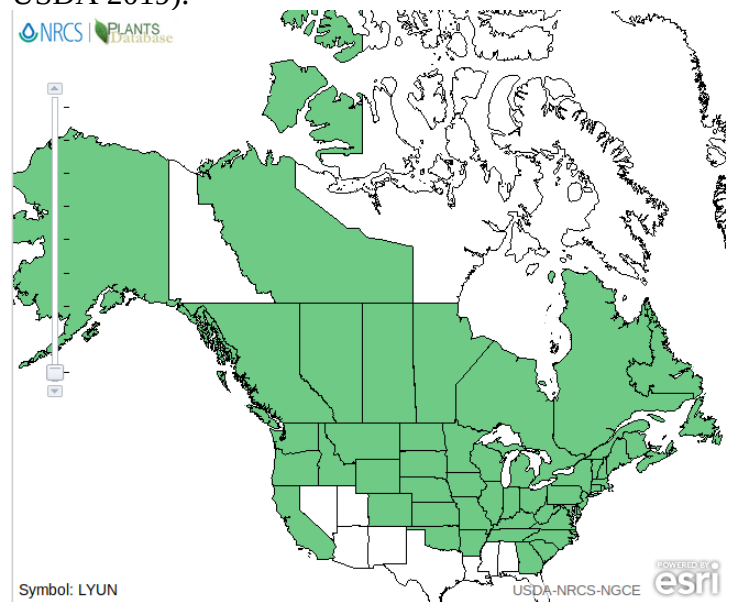
TAXONOMY

Plant Family	
Scientific Name	Lamiaceae
Common Name	Mint
Species Scientific Name	
Scientific Name	<i>Lycopus uniflorus</i> Michx.
Varieties	<i>Lycopus uniflorus</i> ssp. <i>uniflorus</i> Michx.
Sub-species	No entry
Cultivar	No entry
Common Synonym(s)	No entry
Common Name(s)	Northern water horehound, Northern bugleweed
Species Code (as per USDA Plants database)	LYUN

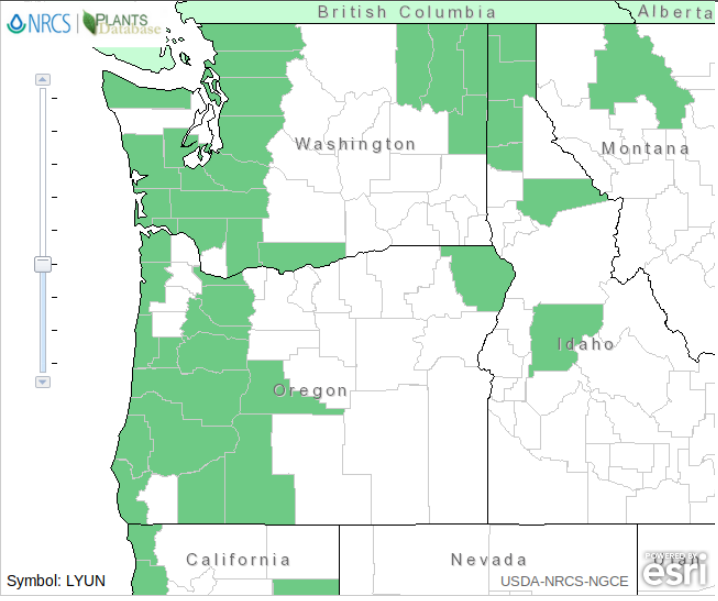
GENERAL INFORMATION

Geographical range

Throughout temperate North America and eastern Asia. On west coast from Alaska to California (Pojar 2004, USDA 2019).



In the pacific northwest:

	 <p>Symbol: LYUN USDA-NRCS-NGCE esri</p> <p>(USDA 2019)</p>
Ecological distribution	Temperate wetlands (USDA 2019, Pojar 2004).
Climate and elevation range	Low to middle elevations in the pacific northwest (Pojar 2004).
Local habitat and abundance	Common in marshes, bogs, near streams, and lakeshores in the pacific northwest. Becomes uncommon in northern latitudes (Pojar 2004, USDA 2019).
Plant strategy type / successional stage	Competes with other rhizomatous wetland vegetation (based on Pojar 2004).
Plant characteristics	Perennial herb with single stems (square shaped) connected via underground tubers (Pojar 2004). Leaf arrangement is bilaterally symmetrical (Zhong 2013). Leaves are 2-8 cm long oppositely arranged and coarsely toothed. Small pinkish-white flowers in whorls along leaf axis. Fruits are hard and nut-like (Pojar 2004). <i>Lycopodium uniflorum</i> has medicinal uses, including treatment of ulcers, urinary tract infections, and working as an anti-inflammatory (Pojar 2004, Saade, et al. 2009).
PROPAGATION DETAILS	
Ecotype	<i>L. americanus</i> seeds originated from Heartland Restoration Services in Ft. Wayne, IN. (Emery, et al. 2011).
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Container
Stock Type	Not specified
Time to Grow	6 – 10 months (Emery, et al. 2011).
Target Specifications	Formation of mature leaves and rhizomes.

Propagule Collection Instructions	Seeds air-dried at room temperature (Emery, et al. 2011).
Propagule Processing/Propagule Characteristics	Four seeds are separable from each cluster (Pojar 2004).
Pre-Planting Propagule Treatments	<p>Store seeds in paper envelope at 4°C (Emery, et al. 2011).</p> <p>Some <i>Lycopus sp.</i> benefit from cold stratification, while it is unnecessary in others (Baskin and Baskin 1998).</p> <p><i>L. americanus</i> shows no difference in germination rates between different light and dark treatments (Baskin and Baskin 1998). Peak germination rates were after 270 days of cold stratification (Baskin and Baskin 1998, Shipley and Parent 1991). One study described optimal germination temperature between 20 and 30°C (Shipley and Parent 1991), however an experimental trial showed a <10% germination rate at 25°C (Emery, et al. 2011). Pre-sowing exposure to 100°C resulted in 2-5 times greater germination rates (Emery, et al. 2011). These same trials showed minimal negative impact on survival of <i>L. americanus</i> exposed to 200°C, but exposure to fire and temperatures exceeding 300°C resulted in little to no germination (Emery, et al. 2011).</p>
Growing Area Preparation / Annual Practices for Perennial Crops	Sow seeds in late spring (Emery, et al. 2011).
Establishment Phase Details	<p>Peak germination temperature varies in <i>Lycopus sp.</i>, ranging from 10-30°C, while some species respond well to low heat treatments (Baskin and Baskin 1998, Emery, et al. 2011).</p> <p>Stratification is not necessary in <i>L. europaeus</i>, but does show increased germination rates with light treatments (Baskin and Baskin 1998). Minimum daily temperatures required for <i>L. europaeus</i> fluctuate between 6.5 and 15°C depending on daily maximum temperatures (Thompson 1970). There is no critical maximum or minimum germination temperature for <i>L. europaeus</i> if the difference between the two temperatures is greater than 7°C. (Thompson 1969).</p> <p>Experimental trials germinated <i>L. americanus</i> seeds on moist filter paper on wet vermiculite in sealed petri dishes. Seeds were stored at 25°C exposed to 16 hours of florescent light alternating with 8 hours of darkness</p>

	(Emery et al. 2011).
Length of Establishment Phase	2 to 4 weeks (Emery, et al. 2011).
Active Growth Phase	Subirrigation may be the most efficient way to provide high water needs, though only after establishment phase (Wilkinson, et al. 2014). Reaches reproductive maturity and able to produce viable seeds within one growing season (Emery, et al. 2011).
Length of Active Growth Phase	6-10 months (Emery, et al. 2011)
Hardening Phase	No entry
Length of Hardening Phase	No entry
Harvesting, Storage and Shipping	Winter dormant season may be best time to transplant (based on Pojar 2004 and Zhong 2013).
Length of Storage	No entry
Guidelines for Outplanting / Performance on Typical Sites	Ensure outplanting sites have reliably wet conditions (Pojar 2004).
Other Comments	Further research on <i>L. uniflorus</i> is needed. Propagation data from <i>L. europaeus</i> and <i>L. americanus</i> serve as a guide to general practices, however it seems likely that ideal germinating conditions vary within the genus (Baskin and Baskin 1998, Emery, et al. 2011). Rhizomatous division is possible with other Lamiaceae, but no research is available suggesting this method is used to propagate any members of <i>Lycopus</i> (based on Pojar 2004 and Zhong 2013).
INFORMATION SOURCES	
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Other Sources Consulted	No entry
Protocol Author	Thomas Stonehocker
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