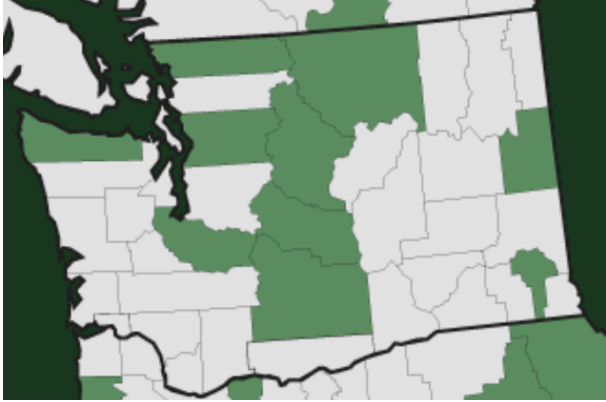
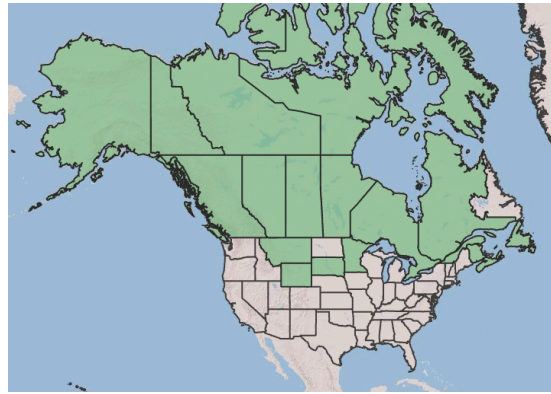


Sela Pagano
Plant Propagation Protocol for Arnica longifolia
ESRM 412- Native Plant Production

Washington Distribution:



North America Distribution:



TAXONOMY:	
(Family Names)	
Family scientific name	Asteraceae (^6)
Family common name	Daisy family
(Scientific Names)	
Genus	Arnica
Species	Arnica longifolia
Species authority	D.C. Eaton
Variety	n/a (could not find information on variety)
Cultivar	(no widely recognized cultivar)
Common synonyms	<ul style="list-style-type: none"> - Arnica mollis (Hook) - Arnica tomentella (Greene) - Arnica latifolia var. tomentella (Greene) Jeps. - Arnica longifolia var. arnoglossa (Rydb.) Maguire (^7)
Common names	Seep spring arnica, spearleav arnica
Species code	ARLO5
GENERAL INFORMATION:	

Geographical range	<ul style="list-style-type: none"> - Geographical range in WA: found on both sides of the cascade crest, from the mountains of the olympic peninsula to the eastern slopes of the cascade range - Spans from western canada and the western united states (^1)
Ecological Distribution	Found in rocky, moist environments like seeps, springs, cliffs and riverbanks. This plant thrives in cool, shady environments (^2)
Climate and elevation range	Middle to high elevations, primarily distributed in mountain areas and prefers the temperate climate of mountain ranges (^1)
Local habitat and abundance	Very stony soil of meadows, talus slopes, often along streams, found in subalpine/ alpine areas (rarely found at lower elevations). (^3)
Plant strategy type/ successional stage	<ul style="list-style-type: none"> - Ability to tolerate various soil conditions and environmental factors including cool/ shady conditions - Tends to establish in areas with moderate sunlight like meadows, stremes and some understory forest types - Found in early-mid successional stages (^4)
Plant characteristics	<p>Flowering plant with a woody stem. It's a small perennial herb that typically grows up to 20 inches tall. The leaves are slightly hairy and the flower petals are yellow (4-6 cm wide).</p> <p>Perennial plant (lives for more than 2 years). It produces both sexually by wind dispersed seeds and vegetatively through rhizomes. (10^)</p> <p>Has a robust taproot system which helps it with drought tolerance.</p> <p>Can be found in many different soil types, including rocky soils but only if they are lime-free and well- drained (^3)</p>
PROPAGATION DETAILS: (source 5- Used plant protocol from species Arnica Frigida)	
Ecotype	Subalpine meadows, logan pass, Glacier National Park
Propagation goal	Plants

Propagation method	Seeds
Product type	Container (plug)
Stock type	160 ml containers
Time to grow	7 months
Target specifications	Height: 7 cm, 4 to 6 true leaves; Root system: firm plug in 160 ml container
Propagule collection instructions	Located in areas with full sun or open forest meadow for seed collection. Hand collection in July and August months when achenes are easy to separate from receptacles. Collection in paper bags and kept in a well ventilated dry place prior to cleaning.
Propagule processing/ propagule characteristics	Seed longevity: 3 to 5 years at 1-3C in sealed containers. Non- deep physiological dormancy. 100% purity 80-90% germination
Pre-planting propagule treatments	60 day cold/moist stratification: imbibed with water for 4 hours and places in fine mesh bags, buried in moist peat moss in ventilated containers in refrigeration at 1-3 C
Growing area preparation/ annual practice for perennial crops	Growing media: Promix 6:1:1 sphagnum peat: Vermiculture: perlite. 160 ml containers
Establishment phase details	Arnica seeds germinate uniformly at 22C. Thin seed coat susceptible to insect damage and rot. Medium kept slightly moist through misting twice a day. True leaves emerge 2 weeks after initial germination. (^8)
Length of establishment phase	4 weeks
Active growth phase	Once this plant is fully able to establish, plants have rapid shoot and root growth (2-4 weeks post germination). Plants fertilized with 20-20-20 liquid NPK at 100 ppm weekly.
Length of active growth phase	12 weeks
Hardening phase	Plants fertilized with 10-20-20 liquid NPK at 200 ppm in early fall. Irrigation gradually reduced through september/ october
Length of hardening phase	Harvest date: September Storage: overwinter in outdoor nursery with insulating

	foam cover
Harvesting, storage and shipping (of seedlings)	Harvest date: September Storage: overwinter in outdoor nursery with insulating foam cover
Length of storage	5 months
Guideline for outplanting	No guidelines for outplanting were given
Other comments	n/a
Information Sources:	
Protocol author	Allen Charlier
References	<p>1. Halley, A. (n.d.). <i>Arnica longifolia</i> – <i>Longleaf arnica</i>. Science & Nature of the Oregon Country. http://science.halleyhosting.com/nature/basin/sun/daisy/arnica/longifolia.htm</p> <p>2. Minnesota Wildflowers. (n.d.). <i>Long-leaf arnica</i> (<i>Arnica longifolia</i>). https://www.minnesotawildflowers.info/flower/long-leaf-arnica</p> <p>3. Montana Natural Heritage Program. (n.d.). <i>Arnica longifolia</i> – <i>Longleaf arnica</i>. Montana Field Guide. https://fieldguide.mt.gov/speciesDetail.aspx?elcode=pdast0q0e0</p> <p>4. Michigan Natural Features Inventory. (n.d.). <i>Arnica lonchophylla</i> – <i>Longleaf arnica</i>. https://mnfi.anr.msu.edu/species/description/19768/Arnica-lonchophylla</p> <p>5. University of Washington. (2024). <i>Arnica frigida</i> (protocol document). https://courses.washington.edu/esrm412/protocols/2024/ARFR2.pdf</p> <p>6. Calflora. (n.d.). <i>Arnica longifolia</i>. https://www.calflora.org/app/taxon?crn=687</p> <p>7. OregonFlora. (n.d.). <i>Arnica longifolia</i>. https://oregonflora.org/taxa/index.php?taxon=2966</p> <p>8. Minnesota Department of Natural Resources. (n.d.). <i>Arnica lonchophylla</i>. https://www.dnr.state.mn.us/rsg/profile.html?action=element</p>

	<p>ntDetail&selectedElement=PDAST0Q0D0</p> <p>9. American Southwest. (n.d.). <i>Arnica longifolia</i> – Longleaf <i>arnica</i>. https://www.americansouthwest.net/plants/wildflowers/arnica-longifolia.html</p> <p>10. U.S. Department of Agriculture. (n.d.). <i>Arnica longifolia</i> (ARLO5). USDA Plants Database. https://plants.usda.gov/plant-profile/ARLO5</p>