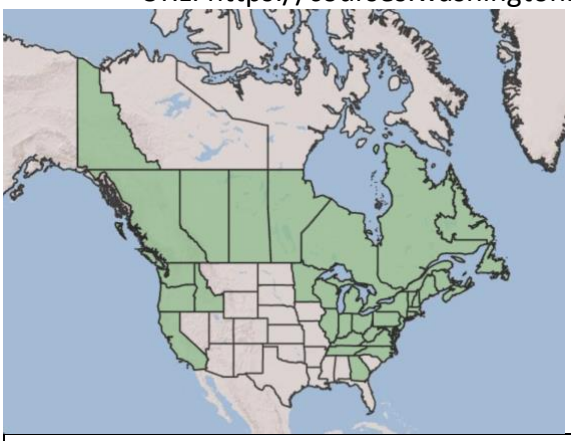
Plant Propagation Protocol for *Trientalis borealis*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/*2024*/TRBO2.pdf



TAXONOMY All information from: (USDA Plants Database, 2024)	
Plant Family	
Scientific Name	*Primulaceae*
Common Name	Primroses
Species Scientific Name	
Scientific Name	*Trientalis borealis* Raf.
Varieties	None.
Sub-species	*Trientalis borealis* Raf. ssp. *borealis* *Trientalis borealis* Raf. ssp. l*atifolia* (Hook.) Hultén
Cultivar	None.
Common Synonym(s)	*Trientalis americana* Pursh *Trientalis europaea* L. var. *latifolia* (Hook.) Torr. *Trientalis latifolia* Hook. *Lysimachia borealis*
Common Name(s)	Starflower Broadleaf Starflower Northern Starflower Pacific Starflower
Species Code (as per USDA Plants database)	TRBO2
GENERAL INFORMATION	
Geographical range	Trientalis Borealis ranges widely across both the East and West coasts of the United States as well as most of the Midwest states plus Minnesota, Tennessee, and Idaho. The range also stretches across all of Canada's Southern territories as well as Yukon. Maps provided at top of document (USDA plants database, 2024), (Pojar, 2023), (inaturalist, 2024)

Ecological distribution	Occurs in coniferous forests, wetlands, meadows, swamps, and bogs (Pojar, 2023)
Climate and elevation range	Moist climates with high winter precipitation, low summer precipitation, and moderate temperatures. Elevation ranges from sea level to subalpine environments as high as ~4500 feet (at the Southern end of its distribution) (Pojar, 2023) (E-flora BC Atlas, 2024)
Local habitat and abundance	Not associated with any particular species, but thrives in shady and moist environments beneath conifer species namely Douglas-fir (*Tsudotsuga menziesii)* (Anderson, 1973)
Plant strategy type / successional stage	Shade-tolerant, Seral (residual after logging), Perennial (Pojar, 2023)
Plant characteristics	Forest-loving groundcover. 5-9 lanced shaped leaves extend from a terminal whorl. Grows 3-8 inches high from small tuberous rhizomes just below the organic soil layer. Produces 1-3 white flowers with 5-7 petals suspended upon an extremely thin stem in the center of the whorl. Asexual reproduction by tubers is more prevalent than reproduction by seed. (Lady bird Johnson Wildflower Center, 2024) (Pojar, 2023)
PROPAGATION DETAILS: VEGETATIVE All information from: (Anderson, 1973)	
Ecotype	Ecotype distribution from across the state of Wisconsin between 1970-1973
Propagation Goal	Rhizomes/tubers or plants
Propagation Method	Vegetative
Product Type	Propagules (rhizomes/tubers) or container (plug)
Stock Type	
Time to Grow	8-10 months for containers, ~3 months for propagules
Target Specifications	Rhizome/tuber slightly smaller than, but still similar in size to that of the mother plant. If growing plants for containers plants should be ~3 inches high
Propagule Collection Instructions	Collect rhizomes/tubers after they have mostly detached from the mother plant for best outcome. Collect in fall or winter
Propagule Processing/Propagule Characteristics	No information found
Pre-Planting Propagule Treatments	No information found
Growing Area Preparation / Annual Practices for Perennial Crops	Loose organic/sandy, acidic soil Could not locate specific information on container size/type
Establishment Phase Details	Establishment phase works best in Early Spring.
Length of Establishment Phase	~1 month, but varies greatly
Active Growth Phase	No information found

Length of Active Growth Phase	No information found
Hardening Phase	No information found
Length of Hardening Phase	No information found
Harvesting, Storage and Shipping	No information found
Length of Storage	Short length of storage, but no specific period of time was found
Guidelines for Outplanting / Performance on Typical Sites	Plant propagules or young plants 2-4 inches apart in large clumps. Cover/surround with a 1-2 inch layer of mulch or other organic media. Initial growth may be slow after outplanting. Water once upon installation, then weekly if conditions are especially dry in winter and/or spring. Information on percent survival rate or growth metrics was not able to be located
Other Comments	Dense patches of *Trientalis Borealis* will persist indefinitely and expand/spread primarily through tubers in the wild
PROPAGATION DETAILS: FROM SEED All information from: (Anderson, 1983) & (Anderson, 1973)	
Ecotype	Not Applicable
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug) or bareroot (field grown)
Stock Type	
Time to Grow	~8 months from seed for best outcome
Target Specifications	Plants should be ~3 inches high
Propagule Collection Instructions	Collect seeds in late summer
Propagule Processing/Propagule Characteristics	No information found
Pre-Planting Propagule Treatments	No information found
Growing Area Preparation / Annual Practices for Perennial Crops	Loose organic/sandy, acidic soil Could not locate specific information on container size/type
Establishment Phase Details	Establishment phase works best in late summer with air dried seeds
Length of Establishment Phase	No exact time found however slow germination is expected
Active Growth Phase	No information found
Length of Active Growth Phase	No information found
Hardening Phase	No information found

Length of Hardening Phase	No information found
Harvesting, Storage and Shipping	No information found
Length of Storage	Short length of storage, do not stratify seeds as it will extend germination time
Guidelines for Outplanting / Performance on Typical Sites	Plant young plants 2-4 inches apart in large clumps. Cover/surround with a 1-2 inch layer of mulch or other organic media. Initial growth may be slow after outplanting. Water once upon installation, then weekly if conditions are especially dry in winter and/or spring. Information on percent survival rate or growth metrics was not able to be located
Other Comments	None
INFORMATION SOURCES	
References	Anderson, R. C., & Beare, M. H. (1983). Breeding system and pollination ecology of Trientalis borealis (Primulaceae). *American Journal of Botany*, *70*(3), 408–415. https://doi.org/10.1002/j.1537-2197.1983.tb06408.x Anderson, R. C., & Loucks, O. L. (1973). Aspects of the biology of Trientalis borealis RAF. *Ecology*, *54*(4), 798–808. https://doi.org/10.2307/1935674 *northern starflower (Lysimachia borealis)*. (n.d.). iNaturalist. Retrieved May 1, 2024, from https://www.inaturalist.org/taxa/204174-Lysimachia-borealis *E-Flora BC Atlas Page*. (n.d.). Ubc.Ca. Retrieved May 1, 2024 *Lady Bird Johnson Wildflower Center - the university of Texas at Austin*. (n.d.). Wildflower.org. Retrieved May 1, 2024, from https://www.wildflower.org/plants/result.php?id_plant=TRBOB Pojar, J., & MacKinnon, A. (2023). *Plants of the pacific northwest coast: Washington, Oregon, British Columbia and Alaska*. Lone Pine Publishing. *USDA plants database*. (n.d.). Usda.gov. Retrieved May 1, 2024, from https://plants.usda.gov/home/plantProfile?symbol=TRBO2
Other Sources Consulted	Cholewa, A. F. (n.d.). *Trientalis borealis*. Floranorthamerica.org. Retrieved May 1, 2024, from http://floranorthamerica.org/Trientalis_borealis

	Lysimachia latifolia. (n.d.). Wnps.org. Retrieved May 1, 2024, from https://www.wnps.org/native-plant-directory/35:lysimachia-latifolia *Northern starflower • Trientalis europaea*. (n.d.). Biodiversity of the Central Coast. Retrieved May 1, 2024, from https://www.centralcoastbiodiversity.org/northern-starflower-bull-trientalis-europaea-ssp-arctica.html
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