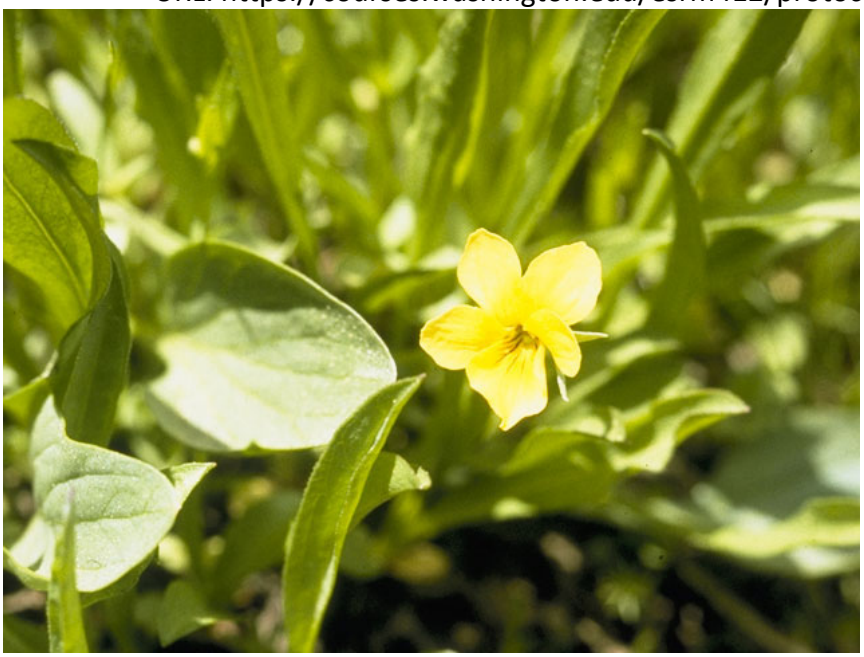
Plant Propagation Protocol for *Viola sheltonii*

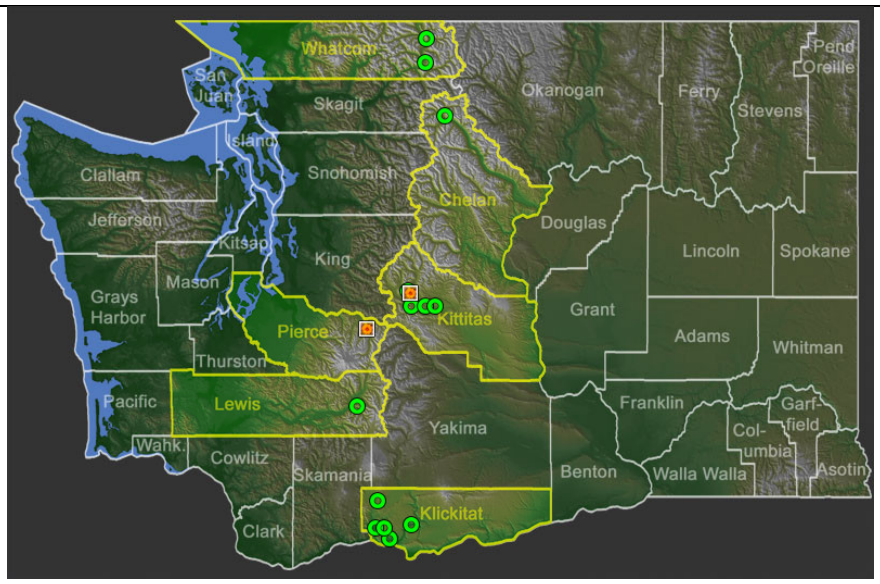
ESRM 412 – Native Plant Production

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



[2] Vick, Albert F.W.

TAXONOMY	
Plant Family	
Scientific Name	Violaceae Batsch [1]
Common Name	Violet family [1]
Species Scientific Name	
Scientific Name	Viola sheltonii Torr. [1]
Varieties (	No recognized varieties
Sub-species	No recognized sub-species
Cultivar	No recognized cultivar
Common Synonym(s	Viola sheltonii var. biternate (Greene) A. Nelson [3]
Common Name(s)	Shelton's violet [1]
Species Code (as per USDA Plants database)	VISH [1]
GENERAL INFORMATION	
Geographical range	Found in the states California, Colorado, Idaho, Oregon, and Washington [2]. In Washington, it can be found on both sides of the cascades crest [4].

	 [4] Map of Viola sheltonii distribution in Washington (Burke) cross the US  [7] Distribution map of Viola sheltonii across the US (eFloras.org)
Ecological distribution	Occurs in coniferous forest understory and is commonly found around moss-covered boulder fields that have an organic layer that has been well-developed [4]
Climate and elevation range	Can be found around 484-2500 m [3]

Local habitat and abundance	Can occur in fir, pine, or oak woodland in either rich or gravelly soil [3]
Plant strategy type / successional stage	Viola are deemed to be a weedy/colonizer strategy type plant [6]
Plant characteristics	A perennial forb/herb [1]. It has a simple leaf complexity and a capsule type of fruit. It can grow up to 10 inches tall. The bloom of its flowers is yellow, purple, and brown and will bloom from March through July [2].
PROPAGATION DETAILS: FROM SEED	
Ecotype	No information available
Propagation Goal	Plants [5]
Propagation Method	Seed [5]
Product Type	Container (plug) [5]
Stock Type	No information available
Time to Grow	Weeks [5]
Target Specifications (	The plant needs to have crowns that are well-developed, and the rhizomes need to be filling the soil profile in the container [5]
Propagule Collection Instructions	Collect seed by hand as seeds capsules are explosive which makes it difficult to collect. Seeds are collected from locally native plants that are in the eastern central Upper Peninsula. The plant flowers from April to June and the seed is harvested in July [8]
Propagule Processing/Propagule Characteristics (	Seeds will dry for 1-2 weeks in paper bags that are open and the seed heads will be shaken or turned. Seeds are not cleaned and upon being dried, the seeds will undergo stratification [8]
Pre-Planting Propagule Treatments	For the stratification process, the seeds should be mixed in equal amounts of perlite or vermiculite. The mixture should be put into a Ziploc style bag, sealed, and stored for about 3 months in a cool and dry place. This could be a refrigerator or a cold garage. They should be in cold storage until they are planted. This can be up to 3 years of storage [8]
Growing Area Preparation / Annual Practices for Perennial Crops (	The plant should be propagated in a greenhouse with fans running continuously for air circulation. During the summer months the vents should be opened to help with cooling. The plants grow best in deep flats with dimensions of 14”x8.5”x4”. However, they can be grown in almost any size plug. Should use Scotts redi-earth plug and seedling mix which contains vermiculite and sphagnum peat moss. It is important to make sure that the soil is sterile. The soil should be thoroughly moistened with water and mixed with a trowel. The holes of the plug should be covered with newspaper to prevent soil loss. Fill the plugs with soil without pressing the soil down and then water the soil and press it down. After that the seeds can be sown with 2 seeds in each cell. Seeds should be sown on the surface so that they can receive the correct amount of light to germinate [8]

Establishment Phase Details	Jan – Aug: greenhouse thermostat should be set to 65F both day and night. Ambient temperature during this season will be around 100F during the day Sept – Dec: greenhouse thermostat should be set to 55F. Ambient temperature in this season will be around 75F during the day The soil should be kept damp throughout germination and the plants should be watered with a fine mist or a light hose setting. There is no need to use artificial light [8]
Length of Establishment Phase	No information available
Active Growth Phase	During this phase it is not important for the soil to be consistently moist. The temperature setting of the greenhouse will remain the same for all plants, so the trays will be moved to the cooler side of the greenhouse (the North side). There is no need for the use of fertilizers [8]
Length of Active Growth Phase	No information available
Hardening Phase	To begin the hardening phase, around early-late spring it is best to move the mature plants into a cold frame. It should be covered by some sort of shade cloth to prevent the plants from scorching. The plants can later be moved outside once the concern of frost is gone. The plant can also be watered less frequently now [8]
Length of Hardening Phase	No information available
Harvesting, Storage and Shipping	Flats in the Upper Peninsula can be transplanted into the field around late May until early October. The flats that were not planted in the summer are not ready yet and will remain in the greenhouse for another season [8]
Length of Storage	No information available
Guidelines for Outplanting / Performance on Typical Sites	No information available
Other Comments	These plants like to grow in mostly shady areas and tend to have a low germination success. Seeds that are ripening need to be monitored to make sure they are collected on time [8]. Information for the propagation details was sourced from information from similar species Viola pensylvania and Viola praemorsa.
INFORMATION SOURCES	
References	[1] *USDA Plants Database*. (n.d.). https://plants.usda.gov/home/plantProfile?symbol=VISH [2] *Lady Bird Johnson Wildflower Center - the University of Texas at Austin*. (n.d.). https://www.wildflower.org/plants/result.php?id_plant=VISH

	[2, photo] *Lady Bird Johnson Wildflower Center - the University of Texas at Austin*. (n.d.). https://www.wildflower.org/gallery/result.php?id_image=7663 [3] *Viola sheltonii*. (n.d.). https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=48311 [4] WTU Herbarium, Burke Museum, University of Washington. (n.d.). *Viola sheltonii - Burke Herbarium Image Collection*. Copyright (C) 2004-2024 WTU Herbarium, Burke Museum, University of Washington. https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Viola+sheltonii [5] *Native plant network — reforestation, nurseries and genetics resources*. (n.d.). https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=violaceae-viola-4085 [6] Marcussen, T., Ballard, H. E., Danihelka, J., Flores, A. R., Nicola, M. V., & Watson, J. M. (2022, August 27). *A revised phylogenetic classification for* viola *(violaceae)*. Plants (Basel, Switzerland). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9460890/ [7] *Map: Viola sheltonii*. (n.d.). http://www.efloras.org/object_page.aspx?object_id=127946&flora_id=1 [8] *Native plant network — reforestation, nurseries and genetics resources*. (n.d.-c). https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=violaceae-viola-2147
Other Sources Consulted	[9] *Native plant network — reforestation, nurseries and genetics resources*. (n.d.-b). https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=violaceae-viola-4084 [10] *Viola sheltonii - FNA*. (n.d.). http://beta.floranorthamerica.org/Viola_sheltonii [11] *FNA: Viola lanceolata vs. Viola sheltonii*. (n.d.). https://nwwildflowers.com/compare/?t=Viola+lanceolata,+Viola+sheltonii [12] *Shelton's Violet (Viola sheltonii)*. (n.d.). iNaturalist Canada. https://inaturalist.ca/taxa/70394-Viola-sheltonii
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