

**Plant Propagation Protocol for *Phlox diffusa***

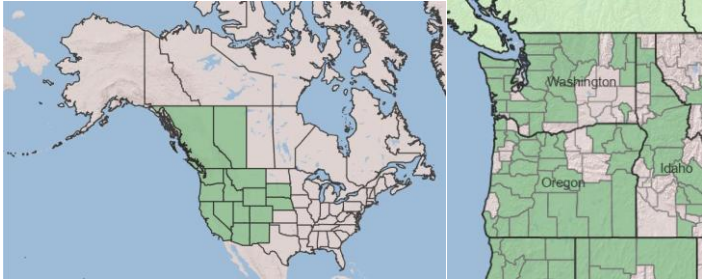
ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2026/PHDI3.pdf>



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<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	Polemoniaceae Juss.
Common Name	Phlox family
<b>Species Scientific Name</b>	
Scientific Name	<i>Phlox diffusa</i> Benth.
Varieties	<i>No recognized varieties.</i>
Sub-species	<i>Phlox diffusa</i> Benth. ssp. <i>diffusa</i> <i>Phlox diffusa</i> Benth. ssp. <i>longistylis</i> Wherry <i>Phlox diffusa</i> Benth. ssp. <i>scleranthifolia</i> (Rydb.) Wherry <i>Phlox diffusa</i> Benth. ssp. <i>subcarinata</i> Wherry
Cultivar	<i>No common cultivars.</i>
Common Synonym(s)	<i>Phlox azurea</i> Glad. L. Sm. <i>Phlox cyanea</i> Eastw. <i>Phlox scleranthifolia</i> Rydb. <i>Phlox diffusa</i> Benth var. <i>longistylis</i> (Wherry) M. Peck

Common Name(s)	Spreading phlox, diffuse phlox, loosely spreading phlox, mat phlox, western moss-phlox, cascade phlox
Species Code (as per USDA Plants database)	PHDI3
<b>GENERAL INFORMATION</b>	
Geographical range	 <p><i>United States (left) and Pacific Northwest (right) distribution of P. diffusa. Sourced from USDA PLANTS Database.<sup>12</sup></i></p> <p>Distributed broadly from the central plains out to the western US coast.<sup>3-4</sup></p>
Ecological distribution	<p>Commonly occurs on rocky slopes and outcroppings, openings and clearings.<sup>3-4,7,13-14</sup> Grows on dry, well-drained, medium- to coarse-textured, gravelly and sandy, soils.<sup>3-4,7,12-13</sup></p> <p>Prefers full sun.<sup>13</sup></p>
Climate and elevation range	<p>Often grows as an alpine or subalpine species<sup>9</sup> on an elevation range from 4,000-8,000 ft.<sup>7</sup></p> <p>Tolerates a broad range of climatic conditions. Generally described as needing 120 frost-free days,<sup>7,12</sup> but known to persist on sites with only a 30-60 day frost-free growing season.<sup>9</sup> Requires 20-40" precipitation and can withstand temperatures down to -13 °F.<sup>7,12</sup></p>
Local habitat and abundance	<p>With a large distribution, <i>P. diffusa</i> is present within a wide variety of plant communities including conifer-dominated forests and woodlands, subalpine and alpine meadows and fell-fields, and dry to dry-mesic alpine systems.<sup>5,9,13</sup> It is often very abundant in these communities and is the dominant forb in some associations.<sup>13-14</sup> Associated with a high abundance of mosses.<sup>14</sup></p> <p>A few associates include subalpine larch, subalpine fir, whitebark pine, mountain hemlock, western white pine, foxtail pine, limber pine, huckleberry oak, Idaho fescue, and Pennsylvania sedge.<sup>13</sup></p>

Plant strategy type / successional stage	<p>A stress-tolerating species. <i>P. diffusa</i> has a high drought tolerance and is prominent in stressful habitats such as exposed alpine outcroppings and sites with unstable pyroclastic material.<sup>7,12-14</sup></p> <p>Characteristic on regularly disturbed sites such as avalanche chutes.<sup>13,14</sup> <i>P. diffusa</i> was notably one of the first vascular plants to re-establish on Mount Saint Helens and the surrounding region following the 1980 eruption.<sup>13</sup></p> <p><i>P. diffusa</i> is a slow growing species with a slow vegetative and seed spreading rate, despite its common name ‘Spreading Phlox’.<sup>3,12</sup></p>
Plant characteristics	<p><i>P. diffusa</i> is a perennial forb with a moderate lifespan.<sup>7,12</sup></p> <p>It has a decumbent growth form, reaching less than 0.5’ at maturity, and a single crown with numerous branches.<sup>7,12</sup> Roots grow to a minimum of 15” deep, with one prominent taproot.<sup>3,7,12</sup></p> <p>Leaves are opposite, narrow (20 mm length to 2 mm width), and glabrous.<sup>4,7</sup></p> <p>Flowers in May to August.<sup>4</sup> Flowers are solitary and sessile, grow at branch tips.<sup>4</sup> 5-lobed flowers are showy, bright white to light pink or blue coloration, with long tubular base.<sup>4</sup></p> <p>Fruit is a capsule with one seed per cell.<sup>4</sup></p>

**PROPAGATION DETAILS: FROM SEED**

Propagation details primarily sourced from Flessner, T., & Trindle, J. (2003)<sup>3</sup>

Ecotype	Crater Lake National Park, 7,000 foot elevation on pumice flats and open gravelly slopes around Rim Village. <sup>3</sup>
Propagation Goal	Plants <sup>3</sup>
Propagation Method	Seed <sup>3</sup>
Product Type	Container (plug) <sup>3</sup>
Stock Type	4 <sup>3</sup>
Time to Grow	1 Year <sup>3</sup>
Target Specifications	Healthy branched crown foliage and tap root. <sup>3</sup>
Propagule Collection Instructions	<p>Collection of seeds is difficult and time-consuming.<sup>3,11</sup></p> <p>Seeds are only present in some collection years and often present in low amounts.<sup>3</sup></p>

	<p>Collection must be carefully timed to collect seeds after ripening (seeds will wither if collected before full ripeness), but before mature capsules dehisce.<sup>3,11</sup></p> <p>For another species in the genus, <i>Phlox gracilis</i>, a less time-consuming method that has been used is allowing seed pods to split onto weed fabric, then vacuuming up the shattered seed.<sup>2</sup> This method may be applicable to <i>P. diffusa</i> seed collection on some sites.</p>
Propagule Processing/Propagule Characteristics	<p>907,000 seeds/lb.<sup>7</sup></p> <p>Seeds are brown and inconspicuous.<sup>12</sup></p>
Pre-Planting Propagule Treatments	<p><b>CLEANING</b> Only processing needed is blowing away chaff/light, empty seeds.<sup>3</sup></p> <p><b>STORAGE</b> Length of possible storage unknown.<sup>3</sup></p> <p><b>DORMANCY</b> Cold stratification is required to break dormancy for <i>P. diffusa</i>.<sup>3,6,12</sup> Stratification between two sheets of moist filter paper (Whatman® No. 1) in petri plates, wrapped in aluminum foil, and left at 5 °C for 5-18 weeks.<sup>6</sup> 17 weeks suggested.<sup>3</sup></p>
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Seeds sown into standard "1040" flats with a fine, soil-less potting mix (Fisons' Sunshine #3 seedling starter); topped with a thin layer of fine vermiculite; watered-in and placed in polyethylene bags in a walk-in cooler at 34-36 °F for 17 weeks.<sup>3</sup></p>
Establishment Phase Details	<p>Place flats with stratified seeds in warm greenhouse (approx. 60 °F nights / 70-85 °F days), and lightly water as needed. <sup>3</sup> 50% of seeds germinated achieved after 45 days with this treatment.<sup>3</sup> Keep seedlings in these flats until large enough to transplant, approximately 4-6 weeks.<sup>3</sup></p> <p>Ensure good air circulation and drainage as seedlings are highly susceptible to damping-off and other fungal attacks.<sup>3</sup></p>
Length of Establishment Phase	<p>12 weeks<sup>3</sup></p>
Active Growth Phase	<p>Transplant seedlings to light, fast-draining potting medium (Fisons' Sunshine Aggregate 4 Plus) in 4" deep pots. One light fertilization of Peters starter (9-45-15) given once after transplanting.<sup>3</sup> Move outdoors to a lightly shaded area.<sup>3</sup></p>

	Continue to ensure good air circulation and to avoid overwatering. <sup>3</sup> Avoid excess fertilization. <sup>3</sup>
Length of Active Growth Phase	3 months: May to July <sup>3</sup>
Hardening Phase	Wait until <i>P. diffusa</i> plants are fairly dry before watering and drain plants quickly after waterings. <sup>3</sup>
Length of Hardening	August to September. <sup>3</sup> <i>P. diffusa</i> becomes dormant by November. <sup>5</sup>
Harvesting, Storage and Shipping	Plants shipped in late August in a refrigerated van. <sup>3</sup>  Can be stored in a walk-in cooler with very lightly moistened soil during winter dormancy. <sup>3</sup>  Do not move plants outside in early spring, to avoid soil becoming waterlogged and plants becoming overwhelmed by foliar/fungal diseases. <sup>3</sup>
Length of Storage	Winter storage is acceptable. Transplant to deeper containers as necessary in spring. <sup>3</sup>
Guidelines for Outplanting / Performance on Typical Sites	<i>No information found.</i>
Other Comments	The applicability of vegetative propagation for <i>P. diffusa</i> plant production is debated. Spontaneous root spreading is not found to occur in natural environments, <sup>3</sup> and some propagators have obtained low to no success using stem cuttings for propagation. <sup>3,12</sup> However, root division has achieved satisfactory results in <i>P. diffusa</i> propagation in some restoration projects without the need for any specialized methods. <sup>7,9</sup>  If preferring to direct seed <i>P. diffusa</i> , plant in late fall to winter with 1-3 lbs per acre. <sup>7,9</sup> If in a climate that snows, seed just before the first winter snow to reduce watering needs. <sup>9</sup> Cover with excelsior mulch for thermal protection and moisture conservation. <sup>9</sup>
<b>INFORMATION SOURCES</b>	
References	[1] Barbour, J. R. (2007). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) Phlox carolina seeds USDA FS - National Seed Laboratory Dry Branch, Georgia. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 15, 2026, from

<https://rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-phlox-3116>

[2] Bartow, A. (2007). Propagation protocol for production of Container (plug) *Phlox gracilis* E. Greene plants USDA NRCS - Corvallis Plant Materials Center Corvallis, Oregon. In: Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 15, 2026, from <https://rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-phlox-2808>

[3] Flessner, T.R., & Trindle, J.D.C. (2003). Propagation protocol for production of Container (plug) *Phlox diffusa* Benth. plants 4; USDA NRCS - Corvallis Plant Materials Center Corvallis, Oregon. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 15, 2026, from <https://nnp.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-phlox-2474>

[4] Giblin, D., & Legler, B. (n.d.). *Phlox diffusa* - spreading phlox. Burke Herbarium Image Collection; Burke Herbarium. Retrieved May 16, 2026, from <https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Phlox%20diffusa>

[5] Gibson, A. C., Rundel, P. W., & Rasoul Sharifi, M. (2008). Ecology and Ecophysiology of a Subalpine Fellfield Community on Mount Pinos, Southern California. *Madroño*, 55(1), 41–51. [https://doi.org/10.3120/0024-9637\(2008\)55\[41:eaaoas\]2.0.co;2](https://doi.org/10.3120/0024-9637(2008)55[41:eaaoas]2.0.co;2)

[6] Kaye, T. N. (1997). Seed dormancy in high elevation plants: Implications for ecology and restoration. *Conservation and Management of Native Plants and Fungi*, 115–120. Native Plant Society of Oregon.

[7] Kingery, J., Cotter, A., & Moseley, K. (2003). *Idaho Roadside Revegetation Handbook* (p. 75). Department of Rangeland Ecology and Management . <https://apps.itd.idaho.gov/apps/research/Completed/RP161.p>

[8] Painter, E. (2016, May 1). *Common (vernacular) names applied to California vascular plants*. The Jepson Online Interchange; California Floristics - University of California, Berkeley. [https://ucjeps.berkeley.edu/cgi-bin/get\\_painter\\_common?37798](https://ucjeps.berkeley.edu/cgi-bin/get_painter_common?37798)

[9] Rochefort, R. M., & Gibbons, S. T. (1992). Mending the Meadow: High-Altitude Meadow Restoration in Mount Rainier National Park. *Ecological Restoration*, 10(2), 120–126. <https://doi.org/10.3368/er.10.2.120>

[10] Rosatti, T. J. (Ed.). (2026). *Phlox diffusa* Benth. Jepson Interchange for California Floristics; The University and Jepson Herbaria - University of California, Berkeley. [https://ucjeps.berkeley.edu/cgi-bin/get\\_cpn?37798](https://ucjeps.berkeley.edu/cgi-bin/get_cpn?37798)

[11] Skinner, D. M.,. (2008). Propagation protocol for production of Container (plug) *Phlox speciosa* Pursh plants 10 cu. in.; USDA NRCS - Pullman Plant Materials Center Pullman, Washington. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 15, 2026, from <https://rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-phlox-3495>

[12] USDA NRCS National Plant Data Team. (n.d.). *Phlox diffusa*. PLANTS Database; USDA. Retrieved May 15, 2026, from <https://plants.sc.egov.usda.gov/plant-profile/PHDI3>

[13] Locklear, J. H. (2011). *Phlox: A Natural History and Gardener's Guide* (pp. 110–115). Timber Press. <https://www.google.com/books/edition/Phlox/L9KgyxXBmCQC?hl=en&gbpv=0>

[14] Milko, R. J. (1984). Vegetation and foraging ecology of the Vancouver Island marmot (*Marmota vancouverensis*) [Thesis]. <https://dspace.library.uvic.ca/items/ceeea9e5-99dc-45a0-ba50-f18725f0abe1>

<p>Other Sources Consulted</p>	<p>James, J. J., Mangold, J. M., Sheley, R. L., &amp; Svejcar, T. (2009). Root Plasticity of Native and Invasive Great Basin Species in Response to Soil Nitrogen Heterogeneity. <i>Plant Ecology</i>, 202(2), 211–220.  <a href="http://www.jstor.org.offcampus.lib.washington.edu/stable/40305697">http://www.jstor.org.offcampus.lib.washington.edu/stable/40305697</a></p> <p>Skinner, D. M., (2008). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Microsteris gracilis</i> (Hook.) Greene seeds USDA NRCS - Pullman Plant Materials Center Pullman, Washington. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved on May 19, 2026 from  <a href="https://rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-microsteris-3494">https://rngr.net/renderNPNProtocolDetails?selectedProtocolIds=polemoniaceae-microsteris-3494</a></p> <p>Zale, P. J., &amp; Jourdan, P. (2015). Genome Size and Ploidy of Phlox paniculata and Related Germplasm in Subsections Paniculatae and Phlox. <i>Journal of the American Society for Horticultural Science</i>, 140(5), 436–448. <a href="https://doi.org/10.21273/jashs.140.5.436">https://doi.org/10.21273/jashs.140.5.436</a></p> <p>Zale, P. J., Robarts, D. W. H., &amp; Jourdan, P. (2016). Genome size and ploidy levels of creeping phlox and related germplasm of mat-forming taxa from eastern and western North America. <i>Scientia Horticulturae</i>, 203, 53–61.  <a href="https://doi.org/10.1016/j.scienta.2016.02.039">https://doi.org/10.1016/j.scienta.2016.02.039</a></p>
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