**Plant Propagation Protocol for *Phlox speciosa***
ESRM 412 – Native Plant Production

*Image: http://www.plantsystematics.org/reveal/pbio/LnC/LnCpublic7.html*

| **TAXONOMY**[1] | |
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| Family Names | |
| Family Scientific Name: | Polemoniaceae |
| Family Common Name: | Phlox |
| Scientific Names | |
| Genus: | *Phlox* |
| Species: | *speciosa* |
| Species Authority: | Pursh |
| Variety: | |
| Sub-species: | |
| Cultivar: | |
| Authority for Variety/Sub-species: | |

[1] United States Department of Agriculture, Natural Resources Conservation Service. *Plants Profile for Phlox Speciosa (Showy Phlox) | USDA Plants.* Retrieved May 23, 2009, from United States Department of Agriculture: http://plants.usda.gov/java/profile?symbol=PHSP

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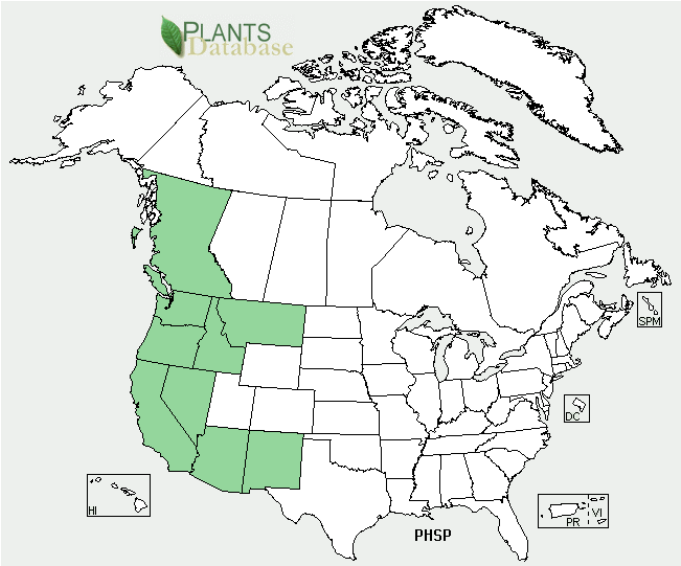
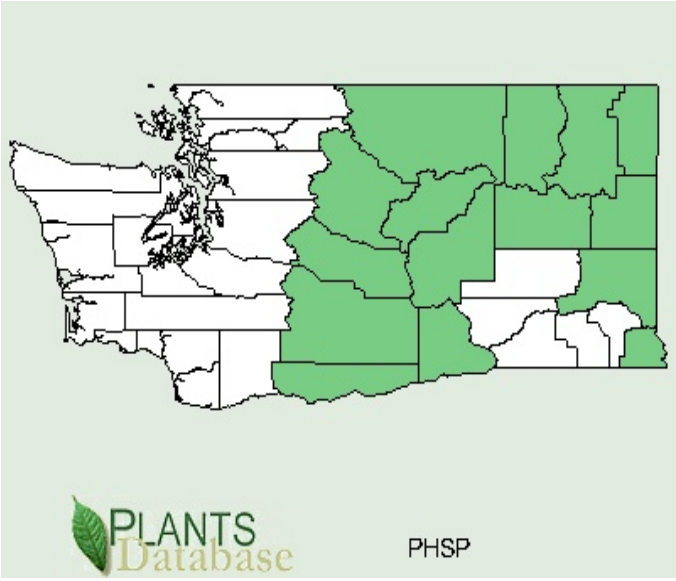
| Common Synonym(s) | *Phlox speciosa* Pursh |
| Common Name(s): | showy phlox |
| Species Code: | PHSP |
| **GENERAL INFORMATION** | |
| Geographical range [2] |  <br>  |

[2] United States Department of Agriculture, Natural Resources Conservation Service. *Plants Profile for Phlox Speciosa (Showy Phlox) | USDA Plants.* Retrieved May 23, 2009, from United States Department of Agriculture: http://plants.usda.gov/java/profile?symbol=PHSP

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| Ecological distribution (ecosystems it occurs in, etc): | Open Douglas-fir and/or ponderosa pine forests; or shrub/grasslands.[3] Prefers rocky slopes.[4] |
| Climate and elevation range | Hot, dry, interior climate.[3] Elevation: 700-1100 m.[4] |
| Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional) | Adapts to a small range of climates. Tolerates an intermediate level of disturbance, such as grazing by cattle and deer. Its habitats often require regular fires to preserve the plant communities. It also appears in areas that have been cleared, and it can tolerate natural erosion processes. It is grown the United States as an ornamental plant.[3] |
| Plant characteristics | perennial herbs.[3] |
| **PROPAGATION DETAILS[5]** | |
| Ecotype: | Paradise Creek drainage near Pullman, Washington. |
| Propagation Goal: | Plants |
| Propagation Method: | Seed |
| Product Type: | Container (plug) |
| Stock Type: | 10 cu. in. |
| Time to Grow: | 4 Months |
| Target Specifications: | Tight root plug in container. |

[3] Committee on the Status of Endangered Wildlife in Canada. (2004). *COSEWIC Assessment and Status Report on the Showy Phlox in Canada*. Retrieved May 23, 2009, From Depository Services Program: http://dsp-psd.pwgsc.gc.ca/Collection/CW69-14-422-2005E.pdf

[4] The Regent of the University of California. (1993). *UC/JEPS: Jepson Manual Treatment for PHLOX Speciosa.* Retrieved May 23, 2009, from The University and Jepson Herbaria: http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?5654,5899,5912

[5] Native Plant Network Protocol Information: http://www.nativeplantnetwork.org/network/view.asp?protocol_id=3495. (accessed 05/23/2009)

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| Propagule Collection: | Fruit is a capsule. The seed is dark brown in color and ripens in late June. Because the plants flower indeterminately and the capsules dehisce forcefully upon ripening, collecting seed is difficult and time-consuming. The seed must be collected as it ripens but before the capsules dehisce.<br>Plants in seed increase plantings can be cut and dried under cover on tarps or in bags. Wild plants should never be collected whole.<br>Small amounts can be dried in paper bags at room temperature with the top of the bag covered with open weave cloth. Larger amounts are dried on tarps in a greenhouse or shed. Plants are covered with garden row cover to prevent seed loss. Fans can be used to assure good air circulation. Stems and leaves are green at this point and mold will occur with poor air circulation. |
| Propagule Processing/Propagule Characteristics: | Most of the seed will shatter in the bag or on the tarp. Plant parts are discarded and the seed collected from the bottom of the bag or tarp. Very little seed is left in the inflorescence and recovering it is not worth the time and effort required.<br>Small amounts are cleaned with an air column separator. Larger amounts are cleaned with air screen equipment.<br>Clean seed is stored in controlled conditions at $40^{o}$ Fahrenheit and 40% relative humidity. |
| Pre-Planting Propagule Treatments: | At least 90 days of cold moist stratification is required for adequate germination.<br>Working with seed of another local ecotype, Nauman (2002) found 120 days of cold moist stratification in the dark resulted in the highest germination. She further noted seed is capable of germinating in cold temperatures. Fall seeding is recommended for another phlox, *P. diffusa* (Kingery et al 2003). Vegetative propagation is also possible (Kruckeberg 1996, Parish et al 1996).<br>Unpublished data from trials conducted at the Pullman Plant Materials Center revealed that 5% emergence occurred without stratification. 45 days of cold, moist stratification resulted in 10% emergence. 90 days of cold, moist stratification resulted in 75% emergence. Increasing stratification time to 120 days resulted in 42% emergence. Seed planted in containers outdoors reached 55% emergence.<br>Germination will occur at cold temperatures. Some seed will germinate during stratification and stratified seed will |

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| | emerge more rapidly than untreated seed. |
| Growing Area Preparation / Annual Practices for Perennial Crops: | In late October or early November seed is sown in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. A thin layer of coarse grit is applied to the top of the planting soil to prevent seeds from floating during watering. Conetainers are watered deeply and placed outside. Conetainers are moved to the greenhouse in January. Alternately, seed can be moist stratified in a refrigerator at 35-40$^{o}$ F for 90 days before sowing in the greenhouse. |
| Establishment Phase: | Medium is kept moist until germination occurs. Germination usually begins in 3 days and is nearly complete in 8 days, although a few seeds will continue to emerge up to 14 days later. |
| Length of Establishment Phase: | 2 weeks |
| Active Growth Phase: | Plants are watered deeply every third day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients. Plants may require water every other day during the final part of the active growth period. |
| Length of Active Growth Phase: | 3-4 months |
| Hardening Phase: | Plants are moved to the cold frame in late March or early April, depending on weather conditions. They are watered every other day if the weather is cool, and every day during hot, dry spells. |
| Length of Hardening Phase: | 2-4 weeks |
| Guidelines for Outplanting / Performance on Typical Sites: | Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site.<br>Survival in seed increase plantings without competing vegetation averages 96%. Transplanting into sites with existing vegetation may reduce survival and vigor depending on weather conditions following planting. A few plants will flower the year following outplanting, but most require 2-3 years to produce seed. Plants will go dormant during the warm parts of the summer. |

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| Other Comments: | No insect problems have been noted. Plants are generally disease free although those growing in unusually wet spring weather conditions or moist microclimates are occassionally subject to powdery mildew.<br>Plants continue to produce good seed crops in increase plantings for at least 5 years.<br>Seed stored in controlled conditions at 40$^{o}$ Fahrenheit and 40% relative humidity retained high germination after 4 years. |
| **INFORMATION SOURCES** | |
| References (full citations): | United States Department of Agriculture, Natural Resources Conservation Service. *Plants Profile for Phlox Speciosa (Showy Phlox) \| USDA Plants.* Retrieved May 23, 2009, from United States Department of Agriculture: http://plants.usda.gov/java/profile?symbol=PHSP<br><br>Committee on the Status of Endangered Wildlife in Canada. (2004). *COSEWIC Assessment and Status Report on the Showy Phlox in Canada.* Retrieved May 23, 2009, From Depository Services Program: http://dsp-psd.pwgsc.gc.ca/Collection/CW69-14-422-2005E.pdf<br><br>The Regent of the University of California. (1993). *UC/JEPS: Jepson Manual Treatment for PHLOX Speciosa.* Retrieved May 23, 2009, from The University and Jepson Herbaria: http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?5654,5899,5912<br><br>Robson, Cathleen A.; Richter, Alice; Filbert, Marianne. (2008). *Encyclopedia of Northwest Native Plants for Gardens and Landscapes.* Portland: Timber Press.<br><br>Native Plant Network Protocol Information: http://www.nativeplantnetwork.org/network/view.asp?protocol_id=3495. (accessed 05/23/2009) |
| Protocol Author (First and last name): | Basel Ismail |
| Date Protocol Created or Updated (MM/DD/YY): | May 23, 2009 |

Note: This template was modified by J.D. Bakker from that available at: http://www.nativeplantnetwork.org/network/SampleBlankForm.asp