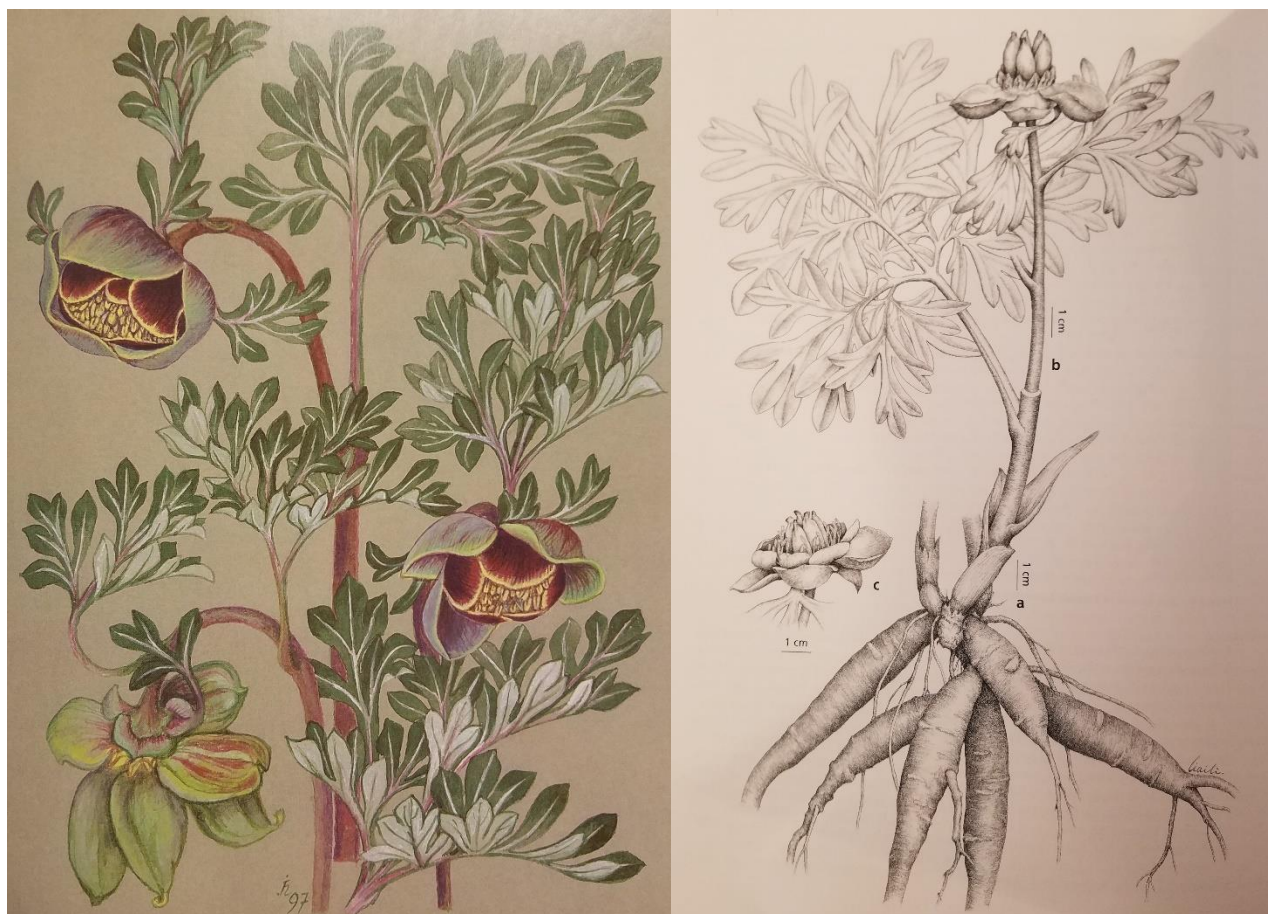


Plant Propagation Protocol for *Paeonia brownii*

ESRM 412 – Native Plant Production

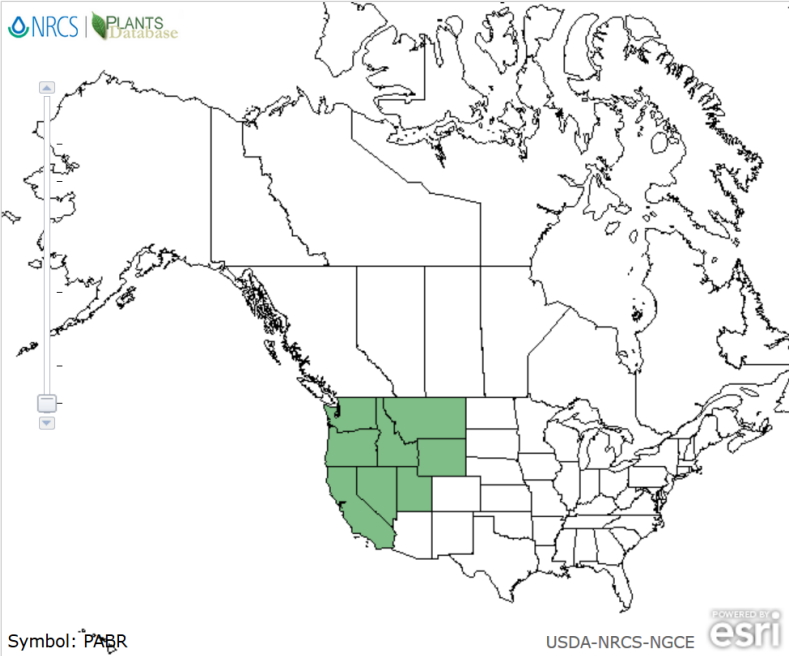
Protocol URL: <https://courses.washington.edu/esrm412/protocols/PABR.pdf>

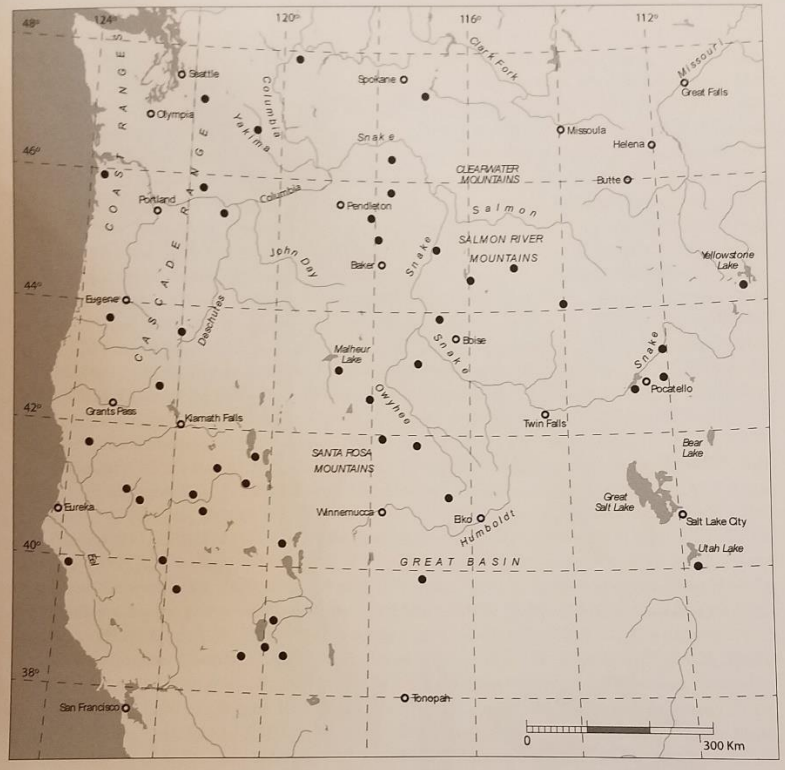


Source: (Left to Right - Halda, 2004 and Hong, 2010)^{5, 7}

TAXONOMY

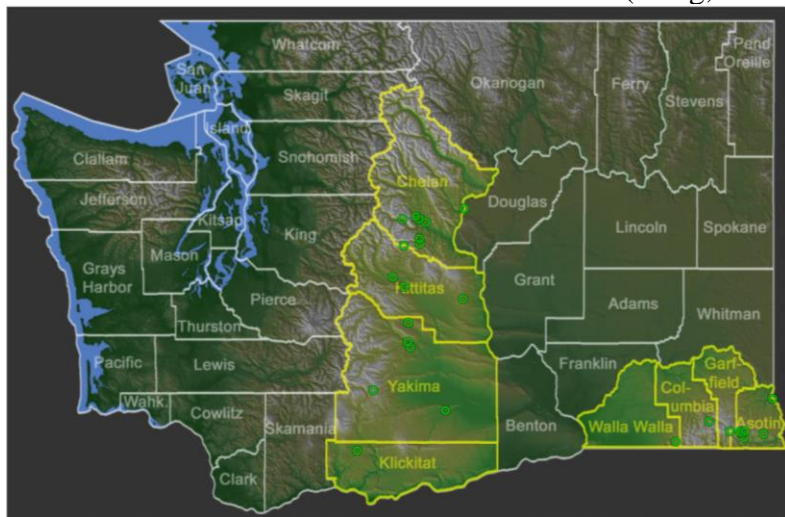
Plant Family	
Scientific Name	Paeoniaceae ¹⁶
Common Name	Peony family ¹⁶
Species Scientific Name	
Scientific Name	<i>Paeonia brownii</i> Douglas ex Hook. ¹⁶
Varieties	None
Sub-species	The USDA Plants database does not recognize any sub-species for <i>Paeonia brownii</i> . ¹⁶ However, alternative literature recognizes the following sub-species. ^{5, 13} <i>Paeonia brownii</i> subsp. <i>californica</i> (Nutt.) Abrams <i>Paeonia brownii</i> subsp. <i>brownii</i>
Cultivar	None ^{13, 16}
Common Synonym(s)	None ^{13, 16}
Common Name(s)	Brown's peony ¹⁶ and Western Peony ^{4, 11}

Species Code (as per USDA Plants database)	PABR ¹⁶
GENERAL INFORMATION	
Geographical range	<p>Confined to the United States lower 48, this species is usually found growing East of Washington's Cascades towards Wenatchee and further to Idaho, Montana, and Wyoming. Additionally, <i>P. brownii</i>'s habitat extends southward to Oregon, California as well as Nevada and Utah.^{1, 11, 16} (Peonies of the World,)</p>  <p>Symbol: PABR</p> <p>USDA-NRCS-NGCE esri</p> <p>Native Introduced Both Absent/Unreported Native, No County Data Introduced, No County Data Both, No County Data</p>
Source: (USDA, 2018) ¹⁶	



Key: Full Circle-Species Location, Half Circle-City

Source: (Hong, 2010)⁷



Source: (Giblin, 2018)⁴

Ecological distribution

The ecosystems in which *P. brownii* occurs in are sagebrush, grassy slopes, sparse chaparral, desert, as well as in *Pinus*, *Picea* and *Populus* forests.^{6,7}

Climate and elevation range

The preferred climate for *P. brownii* is arid and is found in open yellow-pine woods, sagebrush slopes or deep lava-derived soils. This species prefers a dormant winter under snow, a wet spring to promote blooming, and a hot summer to encourage the species to return to dormancy.¹¹

	<i>P. brownii</i> occurs at elevations between 500 to 3000 feet. ^{7, 10}
Local habitat and abundance	The plant species that <i>P. brownii</i> is most associated with are <i>Pinus ponderosa</i> , <i>Pseudotsuga menziesii</i> , <i>Calocedrus decurrens</i> , <i>Populus tremuloides</i> , <i>Larix</i> sp., <i>Castanopsis</i> sp., <i>Ceanothus</i> sp., and <i>Artemisia</i> sp.. ⁷
Plant strategy type / successional stage	<i>P. brownii</i> is a drought and lime tolerant species. ^{7, 8, 10}
Plant characteristics	<p><i>Paeonia brownii</i> is a low growing (~1-2 feet tall), fleshy herbaceous perennial.^{1, 11, 17}</p> <p>Leaves: Large leathery, glaucous and “steely blue-gray”¹¹ in color and ranging from ternate to biternate with deep lobes (1-2) extending into ultimate oblong segments.^{6, 10, 11, 17}</p> <p>Flowers: Solitary, terminal and rarely opening fully, these flowers have five petals, which are “brownish-reddish-purple”⁶ in color and extend past the sepals. The sepals are persistent, unequal, leathery, green with tinges of purple, and 1-2 cm long. Blooms late spring to summer.^{6, 10, 11, 17}</p> <p>Fruits: Five cylindrical follicles that are 2-4 cm long, and about 1.5 cm in diameter.^{4, 5, 7, 17}</p>
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants ²
Propagation Method	Seed ²
Product Type	Container (plug) ²
Stock Type	N/A
Time to Grow	The species takes two growing seasons from germination before it is ready to be outplanted. ^{8, 14}
Target Specifications	The target for <i>P. brownii</i> is to produce a plant with strong root systems so that it has a higher survival rate for out planting. The desire for a strong root system is why it is recommended that the species grow for two full growing seasons. ^{8, 14}
Propagule Collection Instructions	Harvest the mature fruits, which are in clusters of 3-5 follicles, in late summer to early fall. ¹¹ The seeds can be harvested by crushing the follicles and rolling it by hand into a container. These seeds are easily separable from the chaff. ³
Propagule Processing/Propagule Characteristics	The seeds of <i>P. brownii</i> are oblong, large, and blackish-purple in color. ^{1, 11}
Pre-Planting Propagule Treatments	Seeds require two and a half to three months of cold-moist stratification. ^{12, 18}

Growing Area Preparation / Annual Practices for Perennial Crops	Cultivation is most successful on the arid east side of the Cascades as compared to the wetter West-side. ¹¹ Nurseries in western Washington should take note of their humidity levels when propagating this species.
Establishment Phase Details	Ripe seeds should be sown into a cold frame (40 degrees Fahrenheit). ^{3, 8, 14} This species germinate in an epigeal manner with roots forming after five to six weeks and shoots visible in the first spring. ^{3, 8, 14}
Length of Establishment Phase	When the seed is sown fresh from harvesting the Establishment Phase is ~ 6 weeks. However, when the seed is sown after extended storage, the Establishment Phase can take up to 18 months. ^{8, 14}
Active Growth Phase	Because juvenile <i>P. brownii</i> roots are extremely sensitive, seedlings are not up-potted until they are strong enough to handle and are fertigated regularly. ^{8, 14}
Length of Active Growth Phase	Assuming freshly ripen seed was used, the Active Growth Phase is about 20-22 months long. ^{8, 14}
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage, and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	<i>P. brownii</i> is best planted 1-2 inches deep depending on the climate (deeper for cold climates) in the fall. The best soil conditions for outplanting are high organic matter and phosphorous content, well-drained soil, and slightly alkaline. In the first few years after outplanting provide supplemental irrigation to prevent mortality from drying. This species does not bloom until the second spring. ^{8, 14, 20}
Other Comments	<i>Paeonia</i> is the only genus of the Paeoniaceae family, and <i>Paeonia brownii</i> is the only <i>Paeonia</i> species native to the Pacific Northwest. ¹⁰ The Genus (<i>Paeonia</i>) is the Greek name used in honor of <i>Paeon</i> , the physician of the gods, who used the plant medicinally. ⁶ The species (<i>brownii</i>) is named after Scottish botanist Robert Brown. ⁵
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