

Plant Propagation Protocol for *Ranunculus glaberrimus*

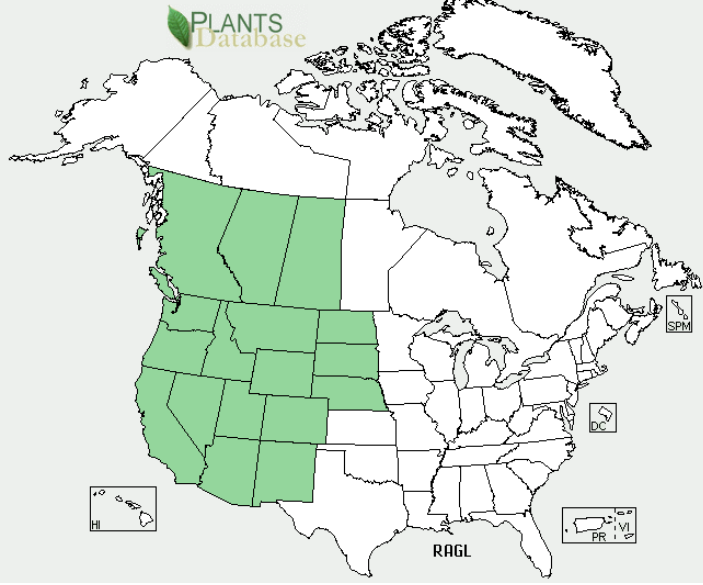
ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2022/RAGLG>



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TAXONOMY	
Plant Family	
Scientific Name	Ranunculaceae
Common Name	Buttercup family (8)
Species Scientific Name	
Scientific Name	<i>Ranunculus glaberrimus</i> Hook. (USDA NRCS)
Varieties	NA
Sub-species	<i>Ranunculus glaberrimus</i> var. <i>ellipticus</i> (Greene) Greene, elliptical buttercup <i>Ranunculus glaberrimus</i> var. <i>glaberrimus</i> , typical variety (6)
Cultivar	NA - No propagation history on record (6, 5, and 3)
Common Synonym(s)	None

Common Name(s)	sagebrush buttercup, shiny-leaved buttercup, early buttercup (6)
Species Code (as per USDA Plants database)	RAGLG
GENERAL INFORMATION	
Geographical range	 <p>Map courtesy of USDA, NRCS. 2013. The PLANTS Database. National Plant Data Team, Greensboro, NC. (2013, August 1).</p> <p>Western North America. Ranges north to southern British Columbia, Alberta, and Saskatchewan and south to Arizona and New Mexico. Reaches as far east as Nebraska, North Dakota, and South Dakota (10). In Washington, occurs east of the Cascades with disjunct populations in the Olympic Mountains and North Cascades (3)</p>
Ecological distribution	<p><i>R. glaberrimus</i> grows in a variety of ecotypes, from dry grasslands to open forests in the steppe and montane zones (2).</p> <p>In Washington, <i>R. glaberrimus</i> occurs in the sagebrush desert, shrub-steppe, and ponderosa pine woodland ecosystems (3)</p>
Climate and elevation range	<p>Can be found from low-elevation grasslands to alpine meadows.</p> <p><i>R. glaberrimus glaberrimus</i> grows at lower elevations at drier sites, from 900 to 6,000 feet.</p> <p><i>R. glaberrimus ellipticus</i> occurs in more montane areas, from 3,200 to 11,000 feet. (6)</p>

Local habitat and abundance	<p><i>R. glaberrimus</i> grows in sandy to loamy soils, with optimum depth 20 inches or more (6). Sagebrush buttercup is adapted to medium textured soils (USDA NRCS) and can grow in both moist and well-drained sites.</p> <p>The two subspecies rarely occur in the same area (6). Sagebrush buttercup is most commonly associated with ponderosa pine (<i>Pinus ponderosa</i>), juniper (<i>Juniperus</i> spp.), and sagebrush, such as big sagebrush (<i>Artemisia tripartita</i>) (6). Other associates include <i>Artemisia cana</i> and <i>Claytonia lanceolata</i> (7).</p>
Plant strategy type / successional stage	<p><i>R. glaberrimus</i> prefers open areas (6), suggesting it is not a highly competitive species.</p>
Plant characteristics	<p><i>R. glaberrimus</i> is a perennial herb that reaches 15 cm in height, growing from clusters of roots that are 1-3 mm wide (Klinkenberg). It has ascending stems with glabrous foliage (4).</p> <p>Subspecies are differentiated by leaf shape: Elliptical buttercup has elliptic to oblanceolate basal leaves, while the typical variety has ovate to obovate, shallowly lobed basal leaves (6)</p> <p>Produces yellow flowers on petioles up to 10 cm long, with spreading sepals and petals 8-15 m long (3).</p> <p>Produces short-hairy achenes that are 1-2 mm long in clusters 10-20 mm wide (4).</p> <p><i>R. glaberrimus</i> has been found to both cross and self-pollinate, with no significant difference in germination viability between reproductive modes (1).</p> <p>Sagebrush buttercup is the first flower of spring throughout most of its range, as it is a cool-season perennial that blooms in early spring. Its flowering time may be influenced by seasonal weather conditions (6). It blooms from March through June (3). It is short-lived and drought intolerant (11).</p>

PROPAGATION DETAILS

Ecotype	NA
Propagation Goal	Plants.
Propagation Method	Seed (6).
Product Type	Container (plug).
Stock Type	172 ml containers (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>).

Time to Grow	8 months (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>).
Target Specifications	Plants with root systems forming firm plugs in container, 4 cm high (5).
Propagule Collection Instructions	Achenes are hand-collected in late summer, transported and stored in paper bags until cleaned (5).
Propagule Processing/Propagule Characteristics	<i>R. glaberrimus</i> has a seed density of 25,00 per lb, with medium seed abundance (11). Seed longevity is unknown.
Pre-Planting Propagule Treatments	Seeds may be cleaned using a hammermill and stored in cold temperatures before undergoing 5 months of outdoor cold moist stratification (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>). This stratification method is suggested due to the species' natural germination occurring in early spring after snowmelt, when temperatures are extremely variable.
Growing Area Preparation / Annual Practices for Perennial Crops	Outdoor nursery conditions. Sow directly into containers with soil mix that is well-draining, cover with media. Suggested mix: 6:1:1 milled sphagnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer according to (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>) Seeds should be sown in fall and stratified throughout the winter.
Establishment Phase Details	Seedlings kept moist and emerge in early spring (5, 6).
Length of Establishment Phase	4 weeks (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Active Growth Phase	After establishment, seedlings should grow quickly and bloom earlier than other spring plants. Seedlings have high light and water requirements (9). Seedlings should be fertilized regularly and should have true leaves within 4 weeks of germination (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Length of Active Growth Phase	10 weeks (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Hardening Phase	Plants are fertilized and irrigation is reduced during the fall (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Length of Hardening Phase	4 weeks (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Harvesting, Storage and Shipping	Plants may be harvested in August, or overwintered under insulating cover (5, extrapolated from subalpine buttercup <i>Ranunculus eschscholtzii</i>)
Length of Storage	5 months (5).

Guidelines for Outplanting / Performance on Typical Sites	<i>R. glaberrimus</i> regenerates both sexually and vegetatively in the wild. Seedlings should be planted in sites similar to the climate of the seedlot used to produce them, and in open areas with moist but well-draining soil (6).
Other Comments	The ability of <i>R. glaberrimus</i> to establish a seed bank and production is currently unknown (6).

INFORMATION SOURCES

References	<ol style="list-style-type: none"> 1. Donnelly, S. 2012. Does Inbreeding Depression Occur in the Sagebrush Buttercup (<i>Ranunculus Glaberrimus</i>)? Thompson Rivers University Undergraduate Research and Innovation Conference. Kamloops, BC 2012. 2. Klinkenberg, Brian. (Editor) 2020. E-Flora BC: Electronic Atlas of the Plants of British Columbia. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. 3. Knoke, D. and Giblin, D. 2004. <i>Ranunculus glaberrimus</i>. Burke Herbarium Image Collection, University of Washington. 4. Lesica et al. 2012. Manual of Montana Vascular lunaPlants. BRIT Press. Fort Worth, TX. 5. Luna, Tara; Evans, Jeff; Wick, Dale. 2008. Propagation protocol for production of Container (plug) <i>Ranunculus eschscholtzii</i> Schlecht. plants 172 ml conetainers; USDI NPS - Glacier National Park West Glacier, Montana. In: Native Plant Network. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. 6. Meyer, Rachele. 2012. <i>Ranunculus glaberrimus</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. 7. Moseley, R. K. 1989. Report on the Conservation Status of <i>Claytonia lanceolata</i> var. <i>Flava</i> in Idaho. Idaho Department of Fish and Game Natural Heritage Section. 8. Swanoara, F. 1958. The Genus <i>Ranunculus</i> in Wyoming. University of Wyoming, Thesis. 9. TWC Staff. 2007. <i>Ranunculus glaberrimus</i>. Lady Bird Johnson Wildflower Center, University of Texas.
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	<p>10. USDA, Agricultural Research Service, National Plant Germplasm System. 2022. Germplasm Resources Information Network (GRIN Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland.</p> <p>11. USDA NRCS National Plant Data Team. 2022. <i>Artemisia tripartita</i>. USDA Plants Database.</p>
Other Sources Consulted	
Protocol Author	Jessica Matyas
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