

**Plant Propagation Protocol for *Anemone multifida* Poir. var. *saxicola* B. Boivin**

ESRM 412 – Native Plant Production

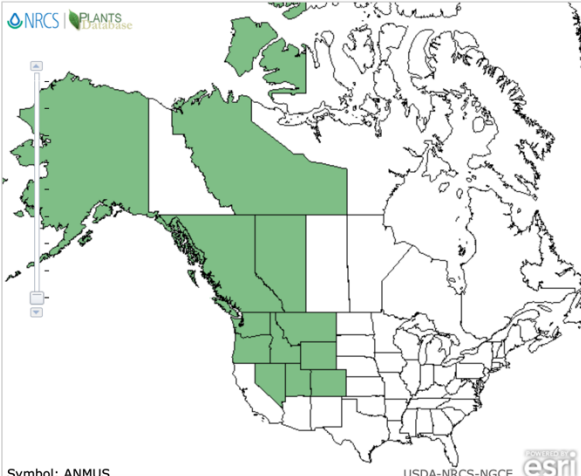
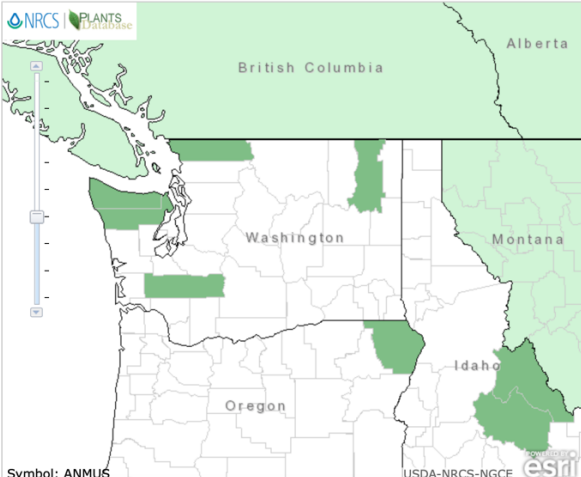
Protocol URL: <https://courses.washington.edu/esrm412/protocols/ANMUS.pdf>



(Photo by Paetow, 2005)<sup>2</sup>

<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	Ranunculaceae
Common Name	Buttercup Family
<b>Species Scientific Name</b>	
Scientific Name	<i>Anemone multifida</i> Poir. var. <i>saxicola</i> B. Boivin
Varieties	<i>Anemone multifida</i> Poir. var. <i>multifida</i> <i>Anemone multifida</i> Poir. var. <i>stylosa</i> (A. Nelson) Dutton & Keener <i>Anemone multifida</i> Poir. var. <i>tetonensis</i> (Porter ex. Britton) C.L. Hitchc.
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	<i>Anemone multifida</i> subsp. <i>saxicola</i> (Boivin) W.A. Weber <i>Anemone multifida</i> var. <i>hirsuta</i> C.L. Hitchc., nom. Inq.
Common Name(s)	Red windflower, cutleaf anemone, pacific anemone
Species Code (as per USDA Plants database)	ANMUS

## GENERAL INFORMATION

<p>Geographical range</p>	<p>Distribution within North America<sup>1</sup></p>  <p>Symbol: ANMUS</p> <p>Distribution within Washington<sup>1</sup></p>  <p>Symbol: ANMUS</p>
<p>Ecological distribution</p>	<p>Mesic to dry grasslands, shrublands, open forests, rock outcrops, meadows in the lowland to subalpine zones<sup>2</sup>, and rocky slopes.<sup>4</sup></p>
<p>Climate and elevation range</p>	<p>Elevation range is around 2195m in British Columbia<sup>2</sup> to 4200m in the Rocky Mountains.<sup>8</sup></p>
<p>Local habitat and abundance</p>	<p>Local habitat is in the foothills to high elevations in the mountains<sup>5</sup>, commonly on gravelly calcareous slopes, riverbanks, lakeshores, and disturbed situations.<sup>6</sup></p>
<p>Plant strategy type / successional stage</p>	<p>A perennial herb.<sup>2</sup></p> <p>The <i>Anemone multifida</i> Poir. species are early seral species. They have no salinity tolerance and a low tolerance to drought.<sup>7</sup></p> <p>All parts of the plant are poisonous when fresh, and toxic if eaten in large quantities.<sup>7</sup></p>

Plant characteristics	<p>A herb that is sparsely to abundantly hairy.<sup>2</sup></p> <p>The leaves are basal, 3 to 6, ascending, 3-10cm wide, smooth to long-hair on upper surfaces and long-hairy on lower surfaces.<sup>2</sup></p> <p>The inflorescence is a 2-7 flowered, terminal cyme or a solitary flower. Flower stalks are long and soft-hairy. Petals are absent. Sepals are usually 5-9, petal-like, from cream-colored to yellowish and tinged with blue, purple, or red, especially on outer surface, sometimes wholly pink, egg shaped to oblong, hairy on the outside but smooth on the inside.<sup>2</sup></p> <p>Achenes are numerous in a spheric head on stalks. They are irregularly elliptic, flat, not winged, and woolly or long-hairy.<sup>2</sup></p>
<b>PROPAGATION DETAILS</b>	
<p>Propagation by Luna, Wick, and Hosokawa, 2008<sup>3</sup></p> <p>Note: This propagation is for the <i>Anemone multifida</i> species and not the specific <i>Saxicola</i> variety</p>	
Ecotype	Festuca idahoensis grassland; Saint Mary, Glacier National Park, Galcier Co., MT., 1371m elevation
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	172ml containers
Time to Grow	8 months
Target Specifications	<p>Stock Type: container seedlings</p> <p>Height: 5-6 true leaves, 4cm</p> <p>Root System: firm plug in conetainer</p>
Propagule Collection Instructions	<p>Seeds are collected in mid-August.</p> <p>Seeds are mature when the achenes are brown and the cotton-like material encasing the seeds is fully expanded.</p> <p>Seeds are collected in paper bags and kept in a well ventilated drying shed prior to cleaning.</p>
Propagule Processing/Propagule Characteristics	<p>Seeds are cleaned with a hammermill.</p> <p>Seed longevity is 5 years at 3 to 5C in sealed containers.</p> <p>Seed dormancy is classified as morpho-physiological dormancy.</p> <p>Seeds/kg: 820,000/kg</p> <p>% purity: 100%</p> <p>% germination: 60%</p>

Pre-Planting Propagule Treatments	2 year old dry stored seeds were placed into a 24 hour running water rinse prior to a 120 day outdoor cold, moist stratification. Germination occurs when day temperature reached 21C in early May. Fresh seeds must be dry stored for 6 months prior to stratification or treated with gibberellic acid prior to cold, moist stratification.
Growing Area Preparation / Annual Practices for Perennial Crops	Outdoor nursery growing facility Sowing Method: direct seedling. Seeds are covered with medium. Growing medium: 6:1:1 milled sphagnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer. Conetainers are filled and sown in late fall and irrigated thoroughly prior to winter stratification. Seedlings germinate in spring under fluctuating outdoor temperatures and are grown under full sun exposure. Seedlings are irrigated in early morning until containers are thoroughly leached. Average growing season of nursery is from late April after snowmelt until October 15 <sup>th</sup> .
Establishment Phase Details	Medium is kept slightly moist during germination. Germination appeared complete in 3 weeks. Seedlings produced 2 true leaves 3-4 weeks after germination.
Length of Establishment Phase	4 weeks
Active Growth Phase	Root development occurs rapidly following germination. Plants are fertilized with 13-13-13 liquid NPK fertilizer at 100 ppm as needed until root tightness is obtained at 3 months. Shoot growth appear limited the first year.
Length of Active Growth Phase	8 weeks
Hardening Phase	Irrigation is slightly reduced in September and October
Length of Hardening Phase	4 weeks
Harvesting, Storage and Shipping	Total time to harvest: 8 months Harvest date: September Storage Conditions: overwinter in outdoor nursery under insulating foam cover and snow
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	There are 3 botanical varieties; var. multifida, var. hirsuta, and var. tetonensis
<b>INFORMATION SOURCES</b>	
References	<sup>1</sup> USDA. (n.d.). <i>Anemone multifida</i> Poir. var. <i>saxicola</i> B. Boivin. Retrieved May 20, 2020, from

<https://plants.usda.gov/core/profile?symbol=ANMUS>

<sup>2</sup> Flora BC: Electronic Atlas of the Flora of British Columbia. (2020). Retrieved May 20, 2020, from <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Anemone+multifida+var.+saxicola>

<sup>3</sup> Luna, T., Wick, D., & Hosokawa, J. (2008). Ranunculaceae (Anemone). Retrieved May 20, 2020, from <https://npn.rngr.net/npn/propagation/protocols/ranunculaceae-anemone-136/?searchterm=Anemone+multifida>

<sup>4</sup> 14b. *Anemone multifida* var. *saxicola* B. Boivin, *Canad. Field-Naturalist*. 65: 2. 1951. (1951). Retrieved May 21, 2020, from [http://www.efloras.org/florataxon.aspx?flora\\_id=1](http://www.efloras.org/florataxon.aspx?flora_id=1)

<sup>5</sup> WTU Herbarium, Burke Museum, & University of Washington. (n.d.). *Anemone multifida*. Retrieved May 21, 2020, from <http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Anemone+multifida>

<sup>6</sup> Cut-leaf Wind-flower. (n.d.). Retrieved May 23, 2020, from [http://www.flora.dempstercountry.org/0.Site.Folder/Species.Program/Species2.php?species\\_id=Anem.multi](http://www.flora.dempstercountry.org/0.Site.Folder/Species.Program/Species2.php?species_id=Anem.multi)

<sup>7</sup> Alberta. (n.d.). *Anemone multifida* Poir. [Scholarly project]. In *Education & Research Archive*. Retrieved May 22, 2020, from <https://era.library.ualberta.ca/items/90e102a7-4df5-499a-a43f-c01a9e2e49d2/view/98ccd313-0427-48b3-b396-3be173af36bf/Anemone-20multifida.pdf>

<sup>8</sup> Bergmann, K. (2013, November 14). ANEMONE MULTIFIDA Poir. – Cut-leaved Anemone, Windflower. Retrieved May 22, 2020, from <https://botany.cz/en/anemone-multifida/>

Other Sources Consulted	<p>Anemone multifida var. saxicola B. Boivin. (n.d.). Retrieved May 22, 2020, from <a href="https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN">https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN</a></p> <p>Hudson Bay Anemone (Anemone multifida var. saxicola). (n.d.). Retrieved May 22, 2020, from <a href="https://idfg.idaho.gov/species/taxa/83904">https://idfg.idaho.gov/species/taxa/83904</a></p> <p>Poiret, Lamarck, J., Dutton, B., Keener, C., &amp; Ford, B. (n.d.). Anemone multifida. Retrieved May 22, 2020, from <a href="http://beta.floranorthamerica.org/Anemone_multifida">http://beta.floranorthamerica.org/Anemone_multifida</a></p> <p>Turner, M. (n.d.). Anemone multifida: Cut-leaf anemone: Wildflowers of the Pacific Northwest. Retrieved May 23, 2020, from <a href="http://www.pnwflowers.com/flower/Anemone-multifida">http://www.pnwflowers.com/flower/Anemone-multifida</a></p> <p>Montana Natural Heritage Program. (2020, May 22). MTNHP. Retrieved May 23, 2020, from <a href="http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDRAN040E0">http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDRAN040E0</a></p> <p>Cut-leaved Anemone — Anemone multifida. Montana Field Guide. Montana Natural Heritage Program. Retrieved on May 22, 2020, from <a href="http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=PDRAN040E0">http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=PDRAN040E0</a></p>
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