
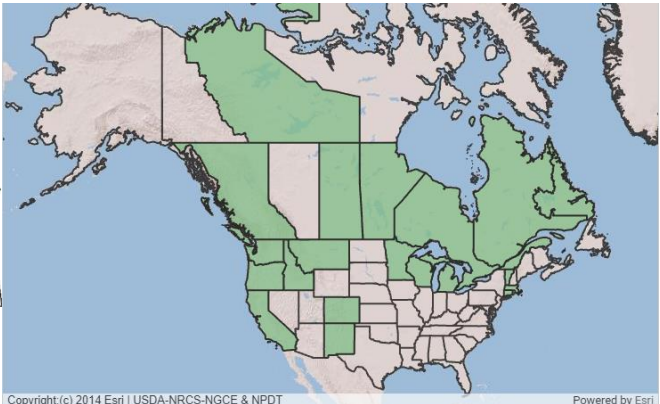


## Plant Propagation Protocol for *Moehringia macrophylla*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2024/MOMA3>

TAXONOMY	
Plant Family	
Scientific Name	Caryophyllaceae
Common Name	Pink
Species Scientific Name	
Scientific Name	<i>Moehringia macrophylla</i> (Hook.) Fenzl
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	<i>Arenaria macrophylla</i> (Hook.)
Common Name(s)	Largeleaf Sandwort
Species Code (as per USDA Plants database)	MOMA3
GENERAL INFORMATION	
Geographical range	<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span>(Turner, 2024)</span> <span>(USDA)</span> </div>
Ecological distribution	Moist to dry, shaded to open woods, meadows, and open rocky hillsides. <sup>3</sup> It is considered a strong indicator of ultramafic soils. <sup>1</sup>
Climate and elevation range	Most common at elevations of 1000-5500 ft in hardiness zones of 7b to 9b. <sup>1</sup>
Local habitat and abundance	More common in the in the southern half of Washington; typically increasing in occurrence eastwards. <sup>3</sup> Occasionally grows in small rock crevices using accumulated organic debris or mosses as substrate. <sup>6</sup>

Plant strategy type / successional stage	Shade and low-water tolerant. <sup>1</sup> Some populations have colonized areas previously disturbed by logging. <sup>6</sup> Recolonizes disturbed areas via wind dispersed seeds. <sup>4</sup>
Plant characteristics	Perennial herb from slender rhizomes, often forming loose spreading mats. Leaves are elliptic or lance-shaped with pointed tips, 2-6 cm long, and are occasionally finely hairy. May to August it has small white sharp pointed flowers with petals no longer than its sepals. <sup>3</sup> Reproduces both sexually and asexually. <sup>6</sup>
<b>PROPAGATION DETAILS: FROM SEED</b>	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	10 cu in. <sup>5</sup>
Time to Grow	4 months <sup>5</sup>
Target Specifications	Tight root plug in container <sup>5</sup>
Propagule Collection Instructions	Insect pollinated flowers produce black capsules containing many tiny black seeds from May to July. <sup>6</sup> Seeds may be collected in July or early August when capsules begin to split. Seeds can be stored in paper bags at room temperature until cleaning. <sup>5</sup>
Propagule Processing/Pr opagule Characteristics	Small amounts may be hand crushed to separate seeds from capsules and other detritus, then cleaned in an air column separator. Larger amounts can be threshed with a hammermill. Clean seeds are stored at 40° F at 40% relative humidity. <sup>5</sup>
Pre-Planting Propagule Treatments	Extended cold, moist stratification (45-90 days) is known to increase germination rate of <i>A. congesta</i> from approximately 25% to 67%. <sup>5</sup> This process may not be necessary for <i>M. macrophylla</i> . Seeds of species closely related to <i>M. macrophylla</i> are known to have an elaiosome; a fleshly edible appendage that attracts insects which may also need to be removed. Typically, once the elaiosome is removed/consumed, seeds germinate readily. <sup>6</sup>
Growing Area Preparation / Annual Practices for Perennial Crops	In October or November, seed is sown into 10 cu in. super cell conetainers with Sunshine #4 growth mix and covered lightly. A thin layer of pea gravel is added to prevent seeds from floating. Conetainers should be well watered and cold, moist stratified seeds may be placed in the greenhouse immediately. <sup>5</sup>

Establishment Phase Details	Seeds in the greenhouse typically begin emergence within 1 day and complete establishment in 7 days. <sup>5</sup>
Length of Establishment Phase	1 week <sup>5</sup>
Active Growth Phase	Plants should be watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer. <sup>5</sup>
Length of Active Growth Phase	3 months <sup>5</sup>
Hardening Phase	Depending on weather, plants are moved outside in late March or April. Watering should continue every other day in cool weather and be increased to every day during hot or dry conditions. <sup>5</sup>
Length of Hardening Phase	2-4 weeks <sup>5</sup>
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	Transplanting is typically done in early May, placing plants in 1.5" diameter holes dug mechanically or by hand. Survival and performance increases greatly (up to 95%) at sites without competing vegetation. <sup>5</sup>
Other Comments	Procedure in this section is developed from propagation information for <i>Arenaria congesta</i> Nutt. (ballhead sandwort) <sup>7</sup> , another WA native species within the Caryophyllaceae family. The genera <i>Arenaria</i> L. and <i>Moehringia</i> L. are considered to be closely related and paraphyletic to one another. The two genera are only differentiated by minor differences in seed morphology. <sup>2</sup> <i>A. congesta</i> typically lives under drier conditions on dry, open slopes with shallow soils <sup>5</sup> while <i>M. macrophylla</i> inhabits very similar but generally wetter conditions. <sup>3</sup>
<b>INFORMATION SOURCES</b>	
References	<ol style="list-style-type: none"> <li>1. CalFlora (2024) <i>Moehringia macrophylla</i> Hook. The Calflora Database (<a href="https://www.calflora.org/">https://www.calflora.org/</a>, 05.14.24).</li> <li>2. Fior, S., Karis, P.O., Casazza, G., Minuto, L. and Sala, F. (2006), <i>Molecular phylogeny of the Caryophyllaceae (Caryophyllales) inferred from chloroplast matK and nuclear rDNA ITS sequences</i>. Am. J. Bot., 93: 399-411. (<a href="https://doi.org/10.3732/ajb.93.3.399">https://doi.org/10.3732/ajb.93.3.399</a>)</li> </ol>

	<ol style="list-style-type: none"> <li>3. MacKinnon, A., &amp; Pojar, J. (2016). <i>Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia &amp; Alaska</i>. Partners Publishing.</li> <li>4. Schoennagel, T. L., &amp; Waller, D. M. (1999). Understory responses to fire and artificial seeding in an eastern cascades abies grandis forest, U.S.A. Canadian Journal of Forest Research, 29(9), 1393–1401. <a href="https://doi.org/10.1139/x99-120">https://doi.org/10.1139/x99-120</a></li> <li>5. Skinner, David M.,. 2006. <i>Propagation protocol for production of Container (plug) Arenaria congesta Nutt</i>; USDA NRCS - Pullman Plant Materials Center Pullman, Washington (<a href="https://www.nrcs.usda.gov/plantmaterials/wapmcmt6528.pdf">https://www.nrcs.usda.gov/plantmaterials/wapmcmt6528.pdf</a>, 05.17.24).</li> <li>6. Smith, W. R. (2023, September). Moehringia macrophylla : Large-leaved sandwort: Rare species guide. Minnesota Department of Natural Resources. (<a href="https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&amp;selectedElement=PDCA0H020">https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&amp;selectedElement=PDCA0H020</a>, 0.5.19.24)</li> <li>7. USDA, NRCS. (2024) <i>Arenaria congesta</i>. PLANTS Database (<a href="https://plants.sc.egov.usda.gov/home/plantProfile?symbol=MOMA3">https://plants.sc.egov.usda.gov/home/plantProfile?symbol=MOMA3</a>, 05.11.24). National Plant Data Team, Greensboro, NC 27401-4901 USA.</li> <li>8. USDA, NRCS. (2024) <i>Moehringia macrophylla</i>. PLANTS Database (<a href="https://plants.sc.egov.usda.gov/home/plantProfile?symbol=ARCO5">https://plants.sc.egov.usda.gov/home/plantProfile?symbol=ARCO5</a>, 05/17/2024). National Plant Data Team, Greensboro, NC 27401-4901 USA.</li> <li>9. Turner, M. (2024). <i>Moehringia macrophylla: Big-leaf sandwort: Wildflowers of the Pacific Northwest</i>. Turner Photographics. (<a href="https://www.pnwflowers.com/flower/moehringia-macrophylla">https://www.pnwflowers.com/flower/moehringia-macrophylla</a>, 05.17.24)</li> </ol>
Other Sources Consulted	Flora of North America Editorial Committee. (2005). <i>Flora of North America north of Mexico. volume 5 Magnoliophyta: Caryophyllidae, Part 2</i> . Oxford University Press.
Protocol Author	Saoirse Lawlor
Date Protocol Created or Updated	05.22.24