

## Plant Propagation Protocol for *Salix melanopsis*

ESRM 412 – Native Plant Production

Spring 2022

URL: <https://courses.washington.edu/esrm412/protocols/2022/SAME2>

North America Distribution



Washington Distribution



Source: USDA Plant Database<sup>8</sup>

### TAXONOMY

<b>Plant Family</b>	
Scientific Name	Salicaceae
Common Name	willow family
<b>Species</b>	
Scientific Name	
Scientific Name	<i>Salix melanopsis</i> Nutt. <sup>9</sup>
Varieties	<i>Salix melanopsis</i> Nutt. var. <i>gracilipes</i> C.R. Ball <i>Salix melanopsis</i> Nutt. var. <i>kronkheittii</i> L. Kelso <i>Salix melanopsis</i> Nutt. var. <i>tenerrima</i> (L.F. Hend.) C.R. Ball <sup>9</sup>
Sub-species	Not Found
Cultivar	Not Found
Common Synonym(s)	<i>Salix bolanderiana</i> Rowlee <i>Salix exigua</i> Nutt. Var. <i>gracilipes</i> (C.R. Ball) Cronquist <i>Salix exigua</i> Nutt. Ssp. <i>Melanopsis</i> (Nutt.) Cronquist <i>Salix exigua</i> Nutt. var. <i>tenerrima</i> (L.F. Hend.) C.K. Schneid. <i>Salix fluviatilis</i> auct. non Nutt. <i>Salix fluviatilis</i> Nutt. var. <i>tenerrima</i> (L.F. Hend.) Howell <i>Salix longifolia</i> Muhl. var. <i>tenerrima</i> L.F. Hend. <i>Salix melanopsis</i> Nutt. var. <i>bolanderiana</i> (Rowlee) C.K. Schneid. <i>Salix parksiana</i> C.R. Ball <i>Salix sessilifolia</i> Nutt. var. <i>vancouverensis</i> Brayshaw <i>Salix tenerrima</i> (L.F. Hend.) A. Heller <sup>9</sup>
Common Name(s)	dusky willow <sup>8</sup> , dusky sandbar willow, dusky coyote willow <sup>8</sup>

Species Code (as per USDA Plants database)	SAME2 <sup>9</sup>
<b>GENERAL INFORMATION</b>	
Geographical range	Western and northern mid-western North America including southwestern Canada <sup>9</sup>  See maps above
Ecological distribution	Riparian zones including streambanks, pink and lake margins, and subalpine meadows <sup>5</sup>
Climate and elevation range	Elevation: 620-2700m <sup>1</sup> Climate: Annual Precipitation: 4.3” – 97.4”, Summer precipitation 0.5” – 2.85”, Coldest Month: 16.0 – 59.1F, Hottest Month: 36.4 – 87.7F, Humidity: 0.13” – 38.56” <sup>2</sup>
Local habitat and abundance	Found in moist and wet habitat on rocky and silty substrates. <sup>2</sup>
Plant strategy type / successional stage	Pioneer species: early successional species well adapted to disturbance like many other willows due to their symbiotic relationship with nitrogen-fixing endophytes <sup>7,4</sup>
Plant characteristics	Tree, shrub up to 4m tall with pointed, oval, lance-shaped or linear leaves about 13cm long that can have entire or serrated margins. Sprouts cream colored or yellow catkin flowers up to 5-6 cm long. <sup>2</sup>
<b>PROPAGATION DETAILS</b>	
*Most information found is for <i>Salix exigua</i> or the <i>Salix</i> family in general; some authorities consider <i>S. melanopsis</i> a subspecies of <i>S. exigua</i> <sup>6</sup>	
Ecotype	(For <i>S. exigua</i> ) Sandbar along the North Fork of the Flathead River, 1100m elevation. Glacier National Park, Flathead Co., MT.

Propagation Goal	Plants or Cuttings <sup>6</sup>
Propagation Method	Seed or Vegetative are both possible, vegetative is more feasible since willow seeds are only viable for very short periods due to their small size. <sup>7</sup>  Easily propagated from cuttings <sup>2</sup>
Product Type	Container (plug) <sup>6</sup>
Stock Type	3 L containers <sup>6</sup>
Time to Grow	1 Year <sup>6</sup>
Target Specifications	Container cutting Height: 15cm Caliper: 6mm Root system: firm plug in 3L containers <sup>6</sup>
Propagule Collection Instructions	Types of cutting: hardwood or softwood tip cuttings Hardwood tip cuttings are collected before bud break. Softwood cuttings can be taken any time after flowering <sup>6</sup>  Flowering season: June-July <sup>5</sup>
Propagule Processing/Propagation Characteristics	Cuttings are kept moist under refrigeration prior to pre-treatment <sup>6</sup>
Pre-Planting Propagule Treatments	Cuttings are 20cm in length and 7mm in caliper. Recut the base & remove 1/3 of leaves or buds. <sup>7</sup> (not specified if angled or flat cut) Place cuttings in a 2-minute fungicide bath to remove surface pathogens. Treat with 1000ppm liquid IBA. Stick cuttings in mist bed with bottom heat at least 2 nodes below the surface of the rooting medium. <sup>6</sup> Cover medium surface with pebbles or rocks to reduce possibility of stem-rot <sup>7</sup>
Growing Area Preparation / Annual Practices for Perennial Crops	Outdoor mist bed automatically mists at 6 second intervals every 6 minutes, adjusting to account for daily heat and wind. Too frequently would result in leaf and stem rot. Maintain bottom heat at 21C with heating cables <sup>6</sup>  After cuttings were potted, they're moved to an outdoor shade house for 4 weeks, then moved to full sun exposure and watered in mornings with an automatic irrigation system <sup>6</sup>

Establishment Phase Details	<p>Cuttings that were pre-rooted were lifted out of mist bed after adequate root systems form.<sup>6</sup></p> <p>Use fresh seeds, they should not be covered or pressed into the medium. Keep seedbed saturated for the first month<sup>2</sup> (only thing I found about propagating <i>Salix melanopsis</i> from seed)</p>
Length of Establishment Phase	2-4 weeks <sup>6</sup>
Active Growth Phase	<p>After being lifted from the mistbeds, the cuttings are potted into 3L containers with a growing medium of 70% 6:1:1 milled sphagnum peat, perlite, and vermiculite and 30% sand with Osmocote controlled release fertilizer (13N:13P2O5:13K2O) 8 to 9 moth release rate at 21C and Micromax fertilizer (12%S, 0.1%B, 0.5%Cu, 12%Fe, 2.5%Mn, 0.05%Mo, 1%Zn) at the rate of 5 grams of Osmocote and 2 grams of Micromax per container.<sup>6</sup></p> <p>After cuttings were potted, they're moved to an outdoor shade house for 4 weeks, then moved to full sun exposure and watered in mornings with an automatic irrigation system<sup>6</sup></p>
Length of Active Growth Phase	6 weeks <sup>6</sup>
Hardening Phase	Irrigation is gradually reduced in September and October, given one final irrigation prior to winterization <sup>6</sup>
Length of Hardening Phase	4 weeks <sup>6</sup>
Harvesting, Storage and Shipping	<p>Total time to harvest: 1 year</p> <p>Harvest date: June</p> <p>Storage Conditions: Overwinter in outdoor nursery under insulating foam and snow<sup>6</sup></p>
Length of Storage	5 months <sup>6</sup>

Guidelines for Outplanting / Performance on Typical Sites	<p>If outplanting soil is poor, it's best to plant well-rooted container-grown plants instead of unrooted cuttings<sup>7</sup></p> <p>Keep newly planted site clear of deep-rooted perennial weeds<sup>7</sup></p> <p>If a site is liable to dry out on the surface, leaf mound, peat or mulch of compost applied in early spring helps retain moisture<sup>7</sup></p>
Other Comments	<p>Most information found is for <i>Salix exigua</i> or the <i>Salix</i> family in general; some authorities consider <i>S. melanopsis</i> a subspecies of <i>S. exigua</i><sup>6</sup></p> <p>Seeds are only viable for a few days after collection<sup>2</sup></p> <p>Seeds should not be covered or pressed into medium. Seedbed should be kept saturated for the first month<sup>2</sup></p>
<b>INFORMATION SOURCES</b>	
References	<p><sup>1</sup> George W. Argus 2012, <i>Salix melanopsis</i>, in Jepson Flora Project (eds.) Jepson eFlora, <a href="https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=42881">https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=42881</a>, accessed on May 03, 2022.<sup>2</sup></p> <p><sup>2</sup> California Native Plant Society. (2010). <i>Dusky willow, Salix melanopsis</i>. Calscape. Retrieved May 2, 2022, from <a href="https://calscape.org/loc-california/Salix%20melanopsis()"><u>https://calscape.org/loc-california/Salix%20melanopsis()</u></a></p> <p><sup>3</sup> Emery, D. E. (1995). <i>Seed propagation of native California plants</i>. Santa Barbara Botanic Garden.</p> <p><sup>4</sup> Doty, S. L., Sher, A. W., Fleck, N. D., Khorasani, M., Bumgarner, R. E., Khan, Z., Ko, A. W., Kim, S.-H., &amp; DeLuca, T. H. (2016). Variable nitrogen fixation in wild populus. <i>PLOS ONE</i>, 11(5). <a href="https://doi.org/10.1371/journal.pone.0155979"><u>https://doi.org/10.1371/journal.pone.0155979</u></a></p> <p><sup>5</sup> Giblin, D. (2009). <i>Salix melanopsis</i>. Burke Herbarium Image Collection. Retrieved May 3, 2022, from <a href="https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Salix+melanopsis"><u>https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Salix+melanopsis</u></a></p> <p><sup>6</sup> Luna, T. (2008). <i>Reforestation, nurseries and genetics resources - NPN.RNGR.NET</i>. Protocol Information <i>Salix</i> (<i>exigua</i>). Retrieved May 4, 2022, from <a href="https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=salicaceae-salix-172"><u>https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=salicaceae-salix-172</u></a></p>

	<p><sup>7</sup>Newsholme, C. (2003). Management and Cultivation. In <i>Willows: The genus Salix</i> (pp. 36–43). essay, Timber Press.</p> <p><sup>8</sup>Painter, E. (2016). <i>Jepson Interchange: Salix Melanopsis Nutt.</i> Jepson Flora Project. Retrieved May 1, 2022, from <a href="https://ucjeps.berkeley.edu/cgi-bin/get_cpn.pl?SAME2">https://ucjeps.berkeley.edu/cgi-bin/get_cpn.pl?SAME2</a></p> <p><sup>9</sup>USDA. (n.d.). <i>Salix melanopsis</i>. USDA plants database. Retrieved May 2, 2022, from <a href="https://plants.usda.gov/home/plantProfile?symbol=SAME2">https://plants.usda.gov/home/plantProfile?symbol=SAME2</a></p>
Other Sources Consulted	<p>Brunsfeld, S. J., Miller, T. R., &amp; Carstens, B. C. (n.d.). <i>Insights into the biogeography of the Pacific Northwest of North America: Evidence from the phylogeography of Salix Melanopsis</i>. Latest TOC RSS. Retrieved May 4, 2022, from <a href="https://www.ingentaconnect.com/content/aspt/sb/2007/00000032/0000001/art00012">https://www.ingentaconnect.com/content/aspt/sb/2007/00000032/0000001/art00012</a></p> <p><i>Integrated Taxonomic Information System - Report</i>. ITIS. (n.d.). Retrieved May 1, 2022, from <a href="https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&amp;search_value=22556#null">https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&amp;search_value=22556#null</a></p>
Protocol Author	Stephen Hao
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