

Plant Propagation Protocol for *Salix pyrifolia*

ESRM 412 – Native Plant Production



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



Source: minnesotawildflowers.info¹

TAXONOMY	
Plant Family	
Scientific Name	Salicaceae
Common Name	Willow
Species Scientific Name	
Scientific Name	<i>Salix pyrifolia</i> Andersson ³
Varieties	<i>Salix pyrifolia</i> Andersson var. <i>lanceolata</i> (Bebb) Fernald ²
Sub-species	None
Cultivar	None
Common Synonym(s)	<i>Salix balsamifera</i> (Hook.) Barratt ex Andersson, <i>Salix balsamifera</i> (Hook.) Barratt ex Andersson var. <i>alpestris</i> Bebb, <i>Salix balsamifera</i> (Hook.) Barratt ex Andersson var. <i>lanceolata</i> Bebb, <i>Salix balsamifera</i> (Hook.) Barratt ex Andersson var. <i>vegeta</i> Bebb, <i>Salix cordata</i> Muhl. var. <i>balsamifera</i> Hook ²
Common Name(s)	Balsam Willow ³
Species Code (as per USDA Plants database)	SAPY ³

GENERAL INFORMATION

<p>Geographical range</p>	 <p>(USDA NRCS National Plant Data Team, 2014³)</p>
<p>Ecological distribution</p>	<p><i>S. pyrifolia</i> is commonly found in wetlands, river and lake margins, bogs, sloughs, conifer swamps, roadsides, clearings, boreal forests, and rocky outcrops⁴.</p>
<p>Climate and elevation range</p>	<p>This species is hardy at a USDA Hardiness Zone 3 and higher, meaning that it can withstand winters where the temperature drops down to nearly -40° F. <i>S. pyrifolia</i> is most commonly found at elevations between 0 and 300 meters in Canada and the Arctic but is able to grow at elevations up to 1600 meters in the northeastern United States⁴.</p>
<p>Local habitat and abundance</p>	 <p>(USDA NRCS National Plant Data Team, 2014³)</p> <p><i>Salix pyrifolia</i> is found just north of Seattle in British Columbia and even as close as the San Juan Islands³. This species is very similar and commonly</p>

	associated with <i>Salix myricoides</i> and <i>Salix eriocephala</i> ⁵ . It grows well in wetland habitat similar to other <i>Salix</i> and <i>Populus</i> species.
Plant strategy type / successional stage	Since <i>S. pyrifolia</i> is in the Salicaceae family, its plant strategy type is similar to other species of Willow. It would be considered a pioneer or early seral species. ⁸
Plant characteristics	This deciduous, medium-sized shrub or tree can grow up to 15 feet tall. <i>S. pyrifolia</i> is a dioecious species that is widely branched and vigorous in growth. Its twigs are glabrous, at first yellowish but becoming bright red when in sunlight. The leaves can be up to four inches long and have serrate to crenate margins ⁵ . Male and female flowers form on separate plants as catkins. <i>S. pyrifolia</i> produces red to maroon fruit capsules that split into two halves when mature ¹ . The buds and foliage of the plants have a balsam-like fragrance.
PROPAGATION DETAILS	
As there is no information on propagation of <i>S. pyrifolia</i> or any of the other synonyms/closely related species, propagation details have been pulled from information on propagating the <i>Salix</i> spp. L. genus in general ⁶ . Since most <i>Salix</i> species are similar in that they are deciduous, woody shrubs and trees, they should have similar propagation techniques, especially because they prefer similar conditions to grow.	
Ecotype	Northern Idaho ⁶
Propagation Goal	Plants ⁶
Propagation Method	Vegetative ⁶
Product Type	Container (plug) ⁶
Stock Type	336 ml containers ⁶
Time to Grow	0
Target Specifications	Target specifications should be roughly 41 cm in height with a firm root plug. ⁶
Propagule Collection Instructions	Collect cuttings from stooling beds or from the wild. Collecting cuttings from multiple, separate plants will assist in increasing genetic diversity. Cuttings should be roughly ½-inch in diameter. ⁶
Propagule Processing/Propagule Characteristics	Whips are taken from the field and cut up into 3-inch sections with at least two buds. All cut material is then placed into sealed plastic bags and stored in refrigerated storage at 34° F. ⁶
Pre-Planting Propagule Treatments	About three days before striking, begin soaking cuttings in a running tap water bath while keeping them in the shade. An acceptable cutting should have a healthy bud within the top inch of the cutting and a second bud on the lower portion. ⁶
Growing Area Preparation / Annual Practices for Perennial Crops	Cuttings are struck into 336 ml containers filled with a 1:1 Sphagnum peat moss and vermiculite medium. After striking, the medium is saturated and allowed to drain to field capacity. Containers are placed inside an open-sided, polycarbonate-roofed growing structure. ⁶
Establishment Phase Details	As soon as leaves begin to appear, fertilize cuttings twice per week. ⁶
Length of Establishment Phase	2 weeks ⁶
Active Growth Phase	During the growing season, cuttings should be pruned 3 to 4 times, depending on the growth rate. As soon as shoots reach 8 to 10 inches, they should be pruned back a few inches. Let them grow another 6 inches or so, and then remove half of

	the new growth since the last pruning. Repeat this process as needed. In early September, cuttings need to be pruned to a final length of about 16 inches. ⁶
Length of Active Growth Phase	4 weeks ⁶
Hardening Phase	Every other week, the cuttings receive one dose of Peters Professional Conifer Finisher to supply 24 ppm N. This rotation continues until mid-August. Then, the Finisher and CAN-17 at 77 ppm N are alternated for the twice per week fertilization. Fertilization is stopped in mid to late October when leaves begin turning color and dropping. ⁶
Length of Hardening Phase	12 weeks ⁶
Harvesting, Storage and Shipping	Once the leaves have dropped by late November, rooted cuttings are extracted by hand, and five are placed at a time in 1.8 L plastic bags. Bags are sealed with narrow, self-locking plastic tags with species name printed on them. Acceptable plants have a firm root system, shoot diameter above the original cutting, and a healthy-looking stem. Height is not a factor because cuttings have been top pruned. Cutting shoots may extend above the sealed bag. Twenty-five bags of seedlings are then placed into a stack-and-nest tote box and stored inside the cooler at 34° F. ⁶
Length of Storage	4 to 5 months ⁶
Guidelines for Outplanting / Performance on Typical Sites	150 one-year-old rooted cuttings were planted into a stooling bed at the University of Idaho nursery. After one growing season, the bed yielded 4500 microcuttings that rooted at 99%+ rate. ⁶
Other Comments	It is very important to note that <i>S. pyrifolia</i> seeds, like many <i>Salix</i> seeds, are viable for a very short period of time ⁷ . This makes it difficult to propagate via seeding/sexual reproduction. Vegetative reproduction through the form of cuttings is the most efficient and easiest way to propagate most <i>Salix</i> species. Another important point is the fact that this species is dioecious ⁷ . This makes it extremely crucial to take cuttings from both male and female plants. Propagating and out planting both types of plants near each other will assist in creating an environment where the <i>S. pyrifolia</i> will eventually be able to pollinate its female plants and create seeds sexually. This will enhance the genetic diversity of the site for the future.
INFORMATION SOURCES	
References	¹ <i>Salix pyrifolia</i> (Balsam Willow). (n.d.). Minnesotawildflowers. Retrieved April 30, 2022, from https://www.minnesotawildflowers.info/shrub/balsam-willow ² <i>Salix pyrifolia</i> – balsam willow. (n.d.). Gobotany.nativeplanttrust. Retrieved April 30, 2022, from https://gobotany.nativeplanttrust.org/species/salix/pyrifolia/ ³ USDA NRCS National Plant Data Team. (2014). <i>Salix pyrifolia</i> Andersson. Plants.usda. Retrieved April 30, 2022, from https://plants.usda.gov/home/plantProfile?symbol=SAPY

	<p>⁴<i>Salix pyrifolia</i> (Balsam Willow). (2017). Worldplants. Retrieved April 30, 2022, from https://www.worldplants.ca/display.php?id=6085</p> <p>⁵New York Natural Heritage Program. (2022). <i>Online Conservation Guide for Salix pyrifolia</i>. Guides.nynhp. Retrieved April 30, 2022, from https://guides.nynhp.org/balsam-willow/#range</p> <p>⁶Morrison, S.; Wenny, D.; Dumroese, K. (2009). <i>Propagation protocol for production of Container (plug) Salix spp. L. plants 336 ml (20.5 cu. in) containers</i>; USDA Forest Service, Southern Research Station Moscow, Idaho. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2022/04/30). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>⁷Temperate Plants Database, Ken Fern. (n.d.). <i>Salix pyrifolia</i>. Temperate.theferns. Retrieved April 30, 2022, from http://temperate.theferns.info/plant/Salix+pyrifolia</p> <p>⁸<i>Salix pyrifolia</i> Andersson. (n.d.). Efloras. Retrieved April 30, 2022, from http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242445846</p>
Other Sources Consulted	<p>⁹Klinkenberg, B. (2020). <i>E-Flora BC: Electronic Atlas of the Plants of British Columbia</i>. Eflora. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. Retrieved April 30, 2022, from http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Salix%20pyrifolia</p> <p>¹⁰Lady Bird Johnson Wildflower Center. (n.d.). <i>PLANT DATABASE – Salix pyrifolia</i>. Wildflower. The University of Texas at Austin. Retrieved April 30, 2022, from https://www.wildflower.org/plants/result.php?id_plant=SAPY</p> <p>¹¹USDA – Fire Effects Information System. (2022). Feis-crs. Retrieved April 30, 2022, from https://www.feis-crs.org/feis/</p>
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