

Plant Propagation Protocol for *Salix serissima*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2021/SASE2.pdf>

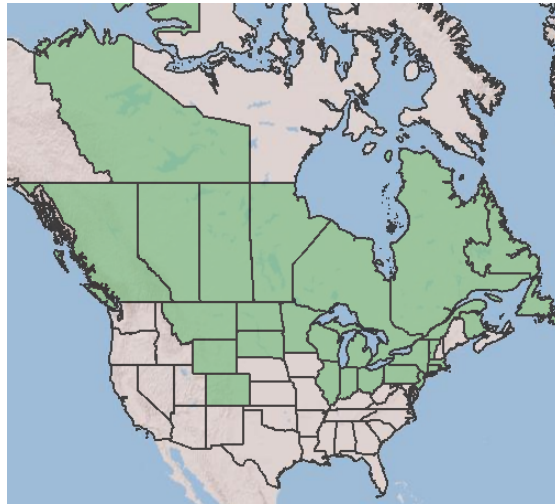


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TAXONOMY	
Plant Family	
Scientific Name	<i>Salicaceae</i> (8).
Common Name	Willow Family (8).
Species Scientific Name	
Scientific Name	<i>Salix serissima</i> (L.H. Bailey) Fernald (8).
Varieties	No listed USDA recognized varieties for SASE2. (Varieties recognized by the USDA can be found listed beneath the three recognized synonyms.)
Sub-species	No listed USDA recognized sub-species.
Cultivar	
Common Synonym(s)	<i>Salix arguta</i> Andersson var. <i>alpigena</i> <i>Salix arguta</i> Andersson var. <i>pallescens</i> <i>Salix lucida</i> Muhl. var. <i>serissima</i> L.H. Bailey (8).
Common Name(s)	Autumn Willow (8).
Species Code (as per USDA Plants database)	SASE2 (8).
GENERAL INFORMATION	
Geographical range	Found in the United States, including in CO, CT, IL, IN, MA, MI, MT, ND, NJ, NY, OH, PA, SD, VT, WI, and WY. Found in Canada, including AB, MB, NB,

NL, ON, QC, and SK. See maps below for extensive geographic distribution, as well as a more focused look at the Pacific Northwest (10).



Source: USDA Plants Database (8)



Source: USDA Plants Database (8)

Ecological distribution	Most commonly bogs, swamps, marshes, fens (10).
Climate and elevation range	Most often found in areas with cold winters, and in widely-varying elevations, 10 - 3,000 meters (9).
Local habitat and abundance	Associated with marshy-areas with high nutrient availability and pH values (5).
Plant strategy type / successional stage	Weeds are a risk to early development of <i>Salix serissima</i> F. especially in its propagation (6). Taller woody-species are also a threat to Autumn willows as well, as they can overtake them (3).
Plant characteristics	Classified under the growth habit of both a shrub and tree (8). They are perennial, with flowering occurring in the May-July time frame with fruit production in late summer to autumn . This is a major distinguishing

	<p>feature of autumn willows from most other willows which commonly flower in late spring, early summer with seeds that remain dormant throughout the winter. (5).</p> <p>Autumn willows are dicot plants (8). The plant has olive bark (which fades grey as it ages, and can be a yellow or red color in its youth) with a height ranging from 1 to 4 meters (7).</p> <p>The tapered-tipped leaves which hold glandular petioles are another important feature that hold Autumn willows apart from other willows (4).</p>
PROPAGATION DETAILS	
Mathers: Propagation Protocol for Bareroot Willows in Ontario using Hardwood Cuttings (6).	
Ecotype	Mather's information comes from data collected on 9 species of willows at Conservation Services Nursery in Toronto, Ontario (one of the species being autumn willow)
Propagation Goal	Cuttings (hardwood).
Propagation Method	Vegetative.
Product Type	Bareroot, field grown.
Stock Type	Bareroot cuttings.
Time to Grow	<p>Can be collected anytime between November and March but must be stored until Spring (varying dates on the climate and weather of the given area and circumstances of the year).</p> <p>It should be noted that Autumn willows flower in late summer to early autumn but the seeds produced are dormant until the spring when they germinate.</p>
Target Specifications	The target size for the autumn willows was 1.5 meters.
Propagule Collection Instructions	<p>Winter collection of cuttings (the period of November - March). This can either be done manually or mechanically. Manually would entail shears for cutting, and mechanically could mean various strategies, such as brush cutters, chain saws, or sickle bar mowers.</p> <p>Collecting cuttings from both male and female will increase the genetic diversity of the subsequent harvest.</p> <p>Cuts should be made close to the earth and Mathers records having harvested sections of both a 15-20 cm</p>

	with a 15-25 mm diameter cutting, and 1 m with a 25 mm diameter cutting.
Propagule Processing/Propagule Characteristics	<p>Portions of the cuttings which are flowering are removed so as all energy goes into rooting, rather than flowering.</p> <p>The cuttings are labeled and stored in sizes of about 20 cuttings together.</p> <p>Mather records that the nursery production beds will allow for around 3200 plants.</p>
Pre-Planting Propagule Treatments	<p>Cuttings must be stored in a cold-setting to mimic the winter; this means they can be refrigerated (Cram and Lindquist), buried in an outdoor pit, or kept in an unheated building.</p> <p>Soaking the cuttings for 48 to 72 hours before implanting them within the beds increases root growth and chances of survival.</p> <p>Different sources have recommended one to two weeks of soaking (1).</p>
Growing Area Preparation / Annual Practices for Perennial Crops	The beds are plowed annually and peat moss is introduced at the volume of 44 cubic yards of peat moss per acre of bed.
Establishment Phase Details	<p>Cuttings are placed 10 cm apart.</p> <p>One can choose whether or not they would like to use rooting hormone, as some journals include this and others do not.</p> <p>Irrigation of the beds must also be tailored in order</p>
Length of Establishment Phase	The cuttings will remain in the production beds from early-to-mid April until mid November.
Active Growth Phase	<p>The cuttings will remain in the production beds from early-to-mid April until mid November.</p> <p>They still are growing, however they are ready to be harvested.</p>
Length of Active Growth Phase	This growth phase is around 7 months in total, however again, this does not mean the growth is done, however the growth target of 1.5 m has been reached.
Hardening Phase	Cold-hardiness is developed by either placing the plants in cold-storage or keeping them in an out-door

	<p>bed throughout the winter after their nursery growth experience.</p>
Length of Hardening Phase	<p>This lasts from when they are harvested in November to when they are outplanted the following Spring.</p> <p>Enduring regular cold-winter temperatures, especially specified to the ones to be expected at the outplant site, is absolutely necessary if the <i>Salix serissima</i> F. is to be successful.</p>
Harvesting, Storage and Shipping	<p>A mechanical seedbed harvester allows for easy removal of the bareroot from the ground. The plants are undercut, which means the soil is removed while their roots are treated carefully and they are ready to be collected from atop the beds.</p> <p>Because they are harvested from the nursery production beds in November, and Spring time is the optimal planting time, often storage is again necessary. Such similar techniques as the young cuttings endured, that being: refrigeration or outdoor temporary-beds.</p>
Length of Storage	<p>Length of storage depends on when they will be transported from the nursery beds to an outplanting, most will remain until they are shipped elsewhere in spring.</p> <p>These strategies ensure the plant will experience a proper cold-season before the spring comes.</p>
Guidelines for Outplanting / Performance on Typical Sites	<p>Autumn willows displayed a success rate >90% of rooting in this study.</p>
Other Comments	<p>It should be noted that much of this information pertains to a Toronto study within a Toronto-climate, and therefore various details could necessitate alterations to fit ulterior locations, however, much of the process (such as the storage, cutting process, wetting process, etc.) remains true regardless of location.</p> <p>It is important to ensure that permission has been granted to cut where one chooses to cut from (1).</p> <p>Growing <i>Salix serissima</i> F. from seeds is, of course, possible, however hardly any reputable publications cover this form of propagation as the begetative propagation of practically all willow plants is widely</p>

	<p>considered more time efficient, cost efficient, and to have higher success rates. Especially in the restoration sense, this protocol is more logical. The seed propagation technique, however, would bear resemblance to this vegetative protocol’s cold storage and imbibement ideals.</p> <p>(Unless otherwise cited, all information in the above “Propagation Details” section pertains to the 6th source.)</p>
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INFORMATION SOURCES	
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References	<p>1. <i>A Guide for Harvesting, Storing, and Planting Dormant Willow Cuttings</i> Colorado Riparian Association. (2020). Coloradoriparian.org. https://coloradoriparian.org/2008/06/20/a-guide-for-harvesting-storing-and-planting-dormant-willow-cuttings-2/</p> <p>2. Argus, G. W. (2020). <i>Salix - FNA</i>. Floranorthamerica.org. http://beta.floranorthamerica.org/Salix</p> <p>3. <i>Autumn Willow</i>. (2020). Ohiodnr.gov. https://ohiodnr.gov/wps/portal/gov/odnr/discover-and-learn/plants-trees/flowering-plants/autumn-willow</p> <p>4. Decker, K. (2006). <i>Peer Review Administered by Society for Conservation Biology Salix serissima (Bailey) Fern. (autumn willow): A Technical Conservation Assessment Prepared</i></p>
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