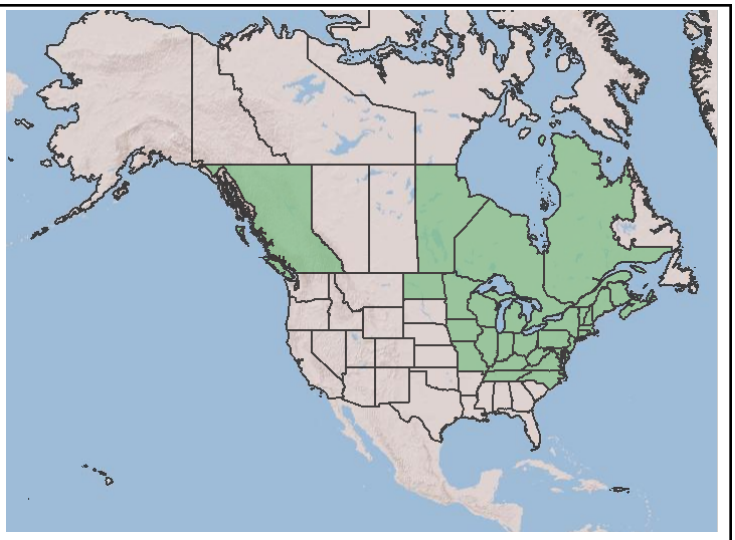
Plant Propagation Protocol for *Populus grandidentata*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2021*/*POGR4.pdf*

Photo from USDA Plants Database

TAXONOMY	
Plant Family	
Scientific Name	Salicaceae
Common Name	Willow family
Species Scientific Name	
Scientific Name	*Populus grandidentata* Michx.
Varieties	None
Sub-species	None
Cultivar	None
Common Synonym(s)	*Populus grandidentata* Michx. var. *angustata* Vict. *Populus grandidentata* Michx. var. *meridionalis* Tidestr. *Populus grandidentata* Michx. var. *subcordata* Vict.
Common Name(s)	Bigtooth aspen
Species Code (as per USDA Plants database)	POGR4
GENERAL INFORMATION	

Geographical range	 (US Department of Agriculture, n.d.)
Ecological distribution	Grows in temperate ecosystems. Thrives in moist, fertile uplands. Small stands can be found on any soil type, but it is most abundant on sandy or loamy sand soil types. Requires soil aeration. (Laidly, n.d.)
Climate and elevation range	Temperate climates. Most abundant between 500 to 2,000 ft in elevation (Laidly, n.d.)
Local habitat and abundance	 Found in British Columbia. Often associated with *Populus tremuloides* (quaking aspen) and *Populus balsamifera* (balsam poplar) (Laidly, n.d.).
Plant strategy type / successional stage	Despite high seed production, seedlings do not commonly occur in nature. Vegetative reproduction is more common, particularly suckering. Suckers develop from lateral roots. Vegetative production also results in the formation of male and female clones (Laidly, n.d.).
Plant characteristics	Tree. Dioecious. Relatively short-lived; stands begin to deteriorate after 50-70 years, and individuals may live

	as long as 100 years. Grows rapidly. Can reach heights of 60-80 feet, and DBH of 10 in. Distinguished from *Populus tremuloides* (quaking aspen) by larger leaves and irregular teeth on the leaf edge. (Laidly, n.d.).
PROPAGATION DETAILS: propagation from seed	
Ecotype	No information found
Propagation Goal	Plants (Baskin & Baskin, 2002; Day et al., 2003).
Propagation Method	Seed (Baskin & Baskin, 2002; Day et al., 2003)
Product Type	Container (plug) (Baskin & Baskin, 2002) Bareroot (Day et al., 2003)
Stock Type	Seeds (Baskin & Baskin, 2002; Day et al., 2003)
Time to Grow	Approximately 10 months (Day et al., 2003).
Target Specifications	Height: 10 to 18 inches (Day et al., 2003).
Propagule Collection Instructions	Seeds mature in May or June (Jennifer H. Carey, 1994). Seeds mature in late April to mid May. Collect when capsules are beginning to show cotton, and seed coats are light brown (Day et al., 2003).
Propagule Processing/Propagule Characteristics	Germination rates are high, so seed density should be low (Jennifer H. Carey, 1994).
Pre-Planting Propagule Treatments	Sow as soon as seeds are ripe (Plants for a Future, n.d.). Clean seeds by placing seeds between two wooden frames with fly screens attached, and vacuum to remove cotton. Then, place seeds in an airtight container and refrigerate at 1.5 degrees C for 1-3 weeks (Day et al., 2003).
Growing Area Preparation / Annual Practices for Perennial Crops	Soil should be kept moist (Plants for a Future, n.d.). Soil is a clay loam, pH 5.5. Till soil to a crumbly texture, then form raised beds to sow seeds. (Day et al., 2003)
Establishment Phase Details	Seeds germinate at 29 to 32 C (Baskin & Baskin, 2002). Sow within the first two weeks of June, keeping soil temperature at 21 degrees C. (Day et al., 2003)
Length of Establishment Phase	Approximately 1.5 months (Day et al., 2003).
Active Growth Phase	Apply nitrogen fertilizer (45N:0P2O5:0K2O) at 55 lb/acre; the following week, apply 10N:6P2O5:4K2O at 250 lb/acre (Day et al., 2003).
Length of Active Growth Phase	Approximately 1.5 months (Day et al., 2003).
Hardening Phase	Allow soil moisture to decrease and allow exposure to ambient temperature (Day et al., 2003).
Length of Hardening Phase	No information found.
Harvesting, Storage and Shipping	Harvest seedlings the spring after they are sowed. Use a seedling lifter. Once seedlings are harvested, place

	them into refrigerated storage at 1-3 degrees C. Cover roots in sphagnum peat moss and return to refrigeration until they can be picked up by buyers. (Day et al., 2003)
Length of Storage	No information found (Day et al., 2003).
Guidelines for Outplanting / Performance on Typical Sites	Seedlings must be 10-18 inches tall, with a diameter of 0.3 mm and a full, undamaged root system. (Day et al., 2003)
Other Comments	Propagation from cuttings is possible, but has a low success rate (Laidly, n.d.) More information on reproduction from cuttings was not available.
INFORMATION SOURCES	
References	Baskin, J. M.; Baskin, C. C. 2002. Propagation protocol for production of Container (plug) Populus grandidentata Michx. plants University of Kentucky Lexington, Kentucky. In: Native Plant Network. http://NativePlantNetwork.org Carey, Jennifer H. 1994. Populus grandidentata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). https://www.fs.fed.us/database/feis/plants/tree/popgra/all.html . Day, R. A., Walter, R. P., Kozar, J. J., Bricker, S. J., Bowers, J. G., & Penn Nursery. (2003, Fall). Propagation protocol for bareroot bigtooth and quaking aspen. *Native Plants*, 125-128. Laidly, P. R. (n.d.). *Populus grandidentata Michx. Bigtooth Aspen*. USDA Forest Service Southern Research Station. https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_2/populus/grandidentata.htm Plants for a Future. (n.d.). *Populus grandidentata - Michx.* Plants for a Future. https://pfaf.org/user/Plant.aspx?LatinName=Populus+grandidentata US Department of Agriculture. (n.d.). *Populus grandidentata*. USDA Plant Database. https://plants.usda.gov/home/basicSearchResults?resultId=89262472-de04-4b4d-a0a6-e6c228483e6a
Other Sources Consulted	Farmer, Robert E., Jr. 1963. Vegetative Propagation of Aspen by Greenwood Cuttings. Journal of Forestry 61(5):385-386. Hall, R. B. et al. 1990. Commercial-scale vegetative propagation of aspens. Aspen Symposium '89 :

	Proceedings. General Technical Report NC-140. North Central Forest Experiment Station Forest Service, U.S. Department of Agriculture St. Paul, Minnesota. 211-219. Sakai, A. K., & Sharik, T. L. (1988). Clonal Growth of Male and Female Bigtooth Aspen (Populus Grandidentata). 69(6), 2031–2033. Lady Bird Johnson Wildflower Center. (n.d.). *Populus grandidentata*. Plant database. https://www.wildflower.org/plants/result.php?id_plant=POGR4
Protocol Author	Alyson Bergomi
Date Protocol Created or Updated	05/26/2021