Plant Propagation Protocol for Kevin Wilen
ESRM 412 – Native Plant Production
Spring 2008

TAXONOMY	
Family Names	
Family Scientific Name:	Populus Tremuloides
Family Common Name:	Quaking Aspen
Scientific Names	
Genus:	Cottonwood- *Populus L (3)*
Species:	*Populus tremuloides (3)*
Species Authority:	Michx (3)
Common Synonym(s) (include full scientific names	Trembling Aspen- *P. tremuloides (2)*
Species Code (as per USDA Plants database):	POTR5 (3)
GENERAL INFORMATION	
Geographical range	Abundant throughout the province of Canada east of the Cascades. Also found in most of Washington except for the Olympic Peninsula, and the sagebrush and subalpine ecosystems. Very sporadic on occurrence. (1)
Ecological	On low to medium elevation, moist to wet sites; forms extensive stands on islands and floodplains along major rivers and on disturbed upland sites. (2)
Climate and elevation range	Elevations of 300m to 1800m. (1)
Plant characteristics	The bark is mostly smooth and white with black 'horseshoe' markings. The leaves have an abrupt tip that are rounded or heart shaped. (1)
PROPAGATION DETAILS	
Propagation Goal	Nursery (3)
Propagation Method	Seed (3)
Product Type	Propagated by Bare Root Yes Propagated by Bulb No Propagated by Container Yes Propagated by Corm No Propagated by Cuttings Yes

	Propagated by Seed Yes Propagated by Sod No Propagated by Sprigs No Propagated by Tubers No (3)
Time to Grow (from seeding until plants are ready to be outplanted):	-Rapid growth rate -65ft. at maturity. (3)
Target Specifications (size or characteristics of target plants to be produced):	
Propagule Collection (how, when, etc):	Collect seed from May to mid-June. Collect cottony, wind-borne seeds about a week before capsule opens. Collect lateral roots when plant is dormant-ideally early spring (4)
Propagule Processing/Propagule Characteristics	Seed per Pound 3600000 Seed Spread Rate Moderate (3)
Pre-Planting Propagule Treatments	Place end of branch with female catkins in water of 8-10°C, high air temperature, and low relative humidity. Remove seeds from capsule once it opens. (4)
Hardening Phase	Plant cuttings 1.3cm deep in vermiculite for six weeks. Cut suckers and place in vermiculite: perlite mixture and mist for 2-3 weeks. Transplant to peat: vermiculite mixture for growth. Temperatures between 15-25°C. (4)
Length of Storage	Dry seeds for three days at 24°C. Viable for one year stored at 5°C and 5-8% moisture content. (4)
Guidelines for Outplanting / Performance on Typical Sites	Recommended planting density-Close proximity, within 25' (5) Planting Density per Acre, Minimum 300 Planting Density per Acre, Maximum 1200 (3)
INFORMATION SOURCES	
References	1. Lyons. C.P, Bill Merilees. Trees, Shrubs & Flowers to Know in Washington & British Columbia. Lone Pine Publishing. 1995. Retrieved April 9, 2008 2. Pojar, J. and MacKinnon, A. 1994. Plants of the Pacific Northwest Coast. Lone Pine Publishing, Redmond, WA.

	3. USDA Natural Resource Conservation Service. Plants Profile. http://plants.usda.gov/java/nameSearch?keywordquery=Mahonia+Nervosa&mode=sciname. Retrieved: April ?, 2008. 4. Rose, Robin, Caryn Chachulski, and Diane Haase. Propagation of Pacific Norhtwest Native Plants. Oregon State University Press, Corvallis, OR. 1998. 5. Rook, Earl. Plants of the North. http://www.rook.org/earl/bwca/nature/flora.html. September 27, 2002.
Other Sources Consulted	1. Eliot, Willard. Forest Trees of the Pacific coast. G.P Putnam's sons. 1938. Retrieved April 9, 2008.
Protocol Author	Kevin Wilen
Date Protocol Created or Updated	04/29/08

Plant Data Sheet

Species (common name, Latin name)
Quaking Aspen, *Populus tremuloides*

Range
Most widely distributed tree in North America, throughout most of the continent from Newfoundland to Alaska, down to the mountains of northern Mexico (Rook, 2002)

Climate, elevation
Colder inland climates over humid coastal climates; near sea level to 3050m (Rose et al., 1998)

Local occurrence (where, how common)
Widely used in landscaping for noise reduction and visual screening (Rook, 2002); along waterways, road cuts, and forest edges.

Habitat preferences

Well drained, high in calcium, loamy soils. Sites disturbed by fire and logging with exposed mineral soil. Grows along forest edges and waterways-shade intolerant (Rose et al., 1998)

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)

Occurs in pure stands as a succesional species that is replaced by conifers (Rook, 2002)

Associated species

Acer rubrum, Abies balsamea, Fraxinus nigra, Populus spp., *Cornus* spp., *Rubus* spp., *Aster macrophyllum, Smilacina stellata, Galium triflorum* (Rook, 2002)

May be collected as: (seed, layered, divisions, etc.)

Seed and vegetative root suckers (Rose et al., 1998)

Collection restrictions or guidelines

Collect seed from May to mid-June. Collect cottony, wind-borne seeds about a week before capsule opens. Collect lateral roots when plant is dormant-ideally early spring (Rose et al., 1998)

Seed germination (needs dormancy breaking?)

Place end of branch with female catkins in water of 8-10°C, high air temperature, and low relative humidity. Remove seeds from capsule once it opens. (Rose et al., 1998)

Recommended seed storage conditions
Dry seeds for three days at 24°C. Viable for one year stored at 5°C and 5-8% moisture content (Rose et al., 1998)

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)
Optimal germination of seeds is at 15-25°C. Surface sow in very moist seedbed; keep well watered. Collect roots for vegetative reproduction that are 1-2cm in diameter and 2.5cm in length (Rose et al., 1998)

Soil or medium requirements (inoculum necessary?)
Plant cuttings 1.3cm deep in vermiculite for six weeks. Cut suckers and place in vermiculite:perlite mixture and mist for 2-3 weeks. Transplant to peat:vermiculite mixture for growth. Temperatures between 15-25°C (Rose et al., 1998)

Installation form (form, potential for successful outcomes, cost)
Container, 12-48" (Fourth, 2003); 0.5-1 gallon (Watson, 2003)

Recommended planting density
Close proximity, within 25' (Rook, 2002)

Care requirements after installed (water weekly, water once etc.)
Must be planted in soil with high moisture content or watered on a daily basis (Watson, 2003)

Normal rate of growth or spread; lifespan
Rapid growth rate, 40ft. at 20 years of age, 65ft. at maturity (VegSpec, 2003); 100+ years old for vigorous individuals (Perala, 1990)

Sources cited
1) Fourth Corner Nurseries. www.4th-corner-nurseries.com; April 7, 2003

2) Perala, D.A. Silvics of North America. http://www.na.fs.fed.us/spfo/pubs/silvics_manual/Volume_2/populus/tremuloides.htm. USDA, Forest Service, Agriculture Handbook 654.December 1990.

3) Rook, Earl. Plants of the North. http://www.rook.org/earl/bwca/nature/flora.html. September 27, 2002.

4) Rose, Robin, Caryn Chachulski, and Diane Haase. Propagation of Pacific Norhtwest Native Plants. Oregon State University Press, Corvallis, OR. 1998.

5) VegSpec. Phil Smith, Project Manager. http://ironwood.itc.nrcs.usda.gov/Netdynamics/Vegspec/pages/HomeVegspec.htm, USDA, Natural Resource Conservation Service. April 7, 2003.

6) Watson, Rae. Forestry Technician. http://nativeplants.for.uidaho.edu/network/view.asp?protocol_id=2370. USDA, J. Herbert Stone Nursery. Protocol Information.

Data compiled by (student name and date)
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