

TAXONOMY	
Family Names	
Family Scientific Name:	Pinaceae
Family Common Name:	Pine family
Scientific Names	
Genus:	Tsuga
Species:	mertensiana
Species Authority:	(Bongard) Carriere.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	
Genus:	
Species:	
Species Authority:	
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Name(s):	Mountain hemlock
Species Code (as per USDA Plants database):	TSME
GENERAL INFORMATION	
General Distribution (geographical range (states it occurs in), ecosystems, etc):	Found in Alaska, British Columbia, Washington, Oregon, California, Idaho, Nevada and Montana.
Climate and elevation range	Sub alpine climate, ranging between 1,000 and 8,000 feet elevation. Temperature range from -20 to 38 degrees C.
Local habitat and abundance; may include commonly associated species	Abundant in clump formations on avalanche prone slopes. Associated with <i>Abies amabilis</i> , <i>Abies lasiocarpa</i> , <i>Chamaecyparis nookatensis</i> , <i>Picea engelmannii</i> , <i>Pinus contorta</i> , and <i>Vaccinium membranaceum</i> .
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Plant tolerates sites with long lasting snowpack. Plants of this genus are very resistant to honey fungus. ³
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the	

seed that was tested came from):	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Seed
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	5 to 8 years. ³
Target Specifications (size or characteristics of target plants to be produced):	Plants 36 inches tall and of ½ inch caliber. ³
Propagule Collection (how, when, etc):	Mature trees bear cones at 20 -30 years of age. ² Good seed crops are observed to occur every 3 years. ² The cones should be collected just prior to opening. Seeds are usually shed in October through December. ⁴
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	For Tsuga heterophylla, seeds average 600,000 per kilogram. Tsuga seeds are very similar, so it is estimated that Tsuga mertensiana seeds are of close weight. If dry stored in a sealed jar at low temperatures, viability can be maintained for several years. ⁴
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Cones open with warmth and seeds can be shaken out. Seeds are very light and small. ⁴ The seeds are somewhat tolerant of drying and can be stored dry. Improper drying may affect viability of the seeds. ⁴ All species of hemlock demonstrate some dormancy in their seed embryo, while others show no dormancy condition. It is not essential to cold stratify seeds, but an increase in germination rates can occur with a cold treatment. ¹ A cold moist stratification for 90 days has been proven effective. ⁶
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Especially likes sandy, acidic soil. ² Plants become thin and poor when grown in dry exposed places. ³
Establishment Phase (from seeding to germination):	Seeds should be sown, firmed and covered. 500 plants per square meter planting density. ⁴
Length of Establishment Phase:	Germination occurs after 30 days. ⁶
Active Growth Phase (from	It is recommended that seedlings are shaded during

germination until plants are no longer actively growing):	their first growing season. High light intensity can be damaging. ⁴
Length of Active Growth Phase:	Spring through Autumn
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	Plants should be allowed many years to establish. Due to their slow growth rate it may take up to 8 years before out-planting. ³ Once seedlings are large enough to handle, they should be individually potted before the hardening phase. ³
Length of Hardening Phase:	3-4 months a year. ⁵
Harvesting, Storage and Shipping (of seedlings):	Trees transplant well at 36 inches tall, but are best planted when between 12 and 16 inches tall. Large trees establish poorly and develop root and wind resistance problems. ³
Length of Storage (of seedlings, between nursery and outplanting):	Store trees at 45 degrees F when transporting long distances.
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	It is recommended to water plants weekly on the out-planting site. After two months, plants should be established enough to compete for water.
Other Comments:	Named after the German naturalist, Karl H. Mertens.

INFORMATION SOURCES

References:	<ol style="list-style-type: none"> 1. Dirr, M.A. <i>The Reference Manual of Woody Plant Propagation</i>. Varsity Press. 1987. 2. Elias, T. <i>The Complete Trees of North America, Field Guide and Natural History</i>. Van Nostrand Reinhold Co. 1980. 3. Huxley, A. <i>The New RHS Dictionary of Gardening</i>. 1992. 4. McMillan-Browse, P. <i>Hardy Woody Plants from Seed</i>. Grower Books. 1985. 5. Sheat, W.G. <i>Propagation of Trees, Shrubs and Conifers</i>. MacMillan and Co. 1948. 6. Baskin, Carol C.; Baskin, Jerry M. 2002. Propagation protocol for production of container <i>Tsuga mertensiana</i> (Bongard) Carriere plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 23 May, 2007). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
-------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Other Sources Consulted (but that contained no pertinent information):	
First Name of Author:	Chris
Last Name of Author:	Duprey
Date Entered or Updated (MM/DD/YY):	05/23/2007

Species

Mountain Hemlock, *Tsuga mertensiana*

Range

From Sequoia National Park in California to Look Inlet in Alaska

Climate, elevation

Sub Alpine. Temp Range -20-38C

Local occurrence

Along the Crest of the Cascades.

Habitat preferences

Loose coarse textured, well-drained acidic soils.

Plant strategy type/successional stage.

Tolerates sites with long lasting snow pack. Not drought/shade tolerant. Minor climax species.

Associated species

Abies amabilis, *Chaecyparis nootkatensis*, *Vaccinium membranaceum*, *Abies Lasiocarpa*, *Picea engelmannii*, *Pinus contorta*

May be collected as:

Seed

Collection restrictions or guidelines

Seeds shed in Late November and December.

Seed germination

Cold stratification of mature seeds shortens incubation time and may substantially increase germination.

Seed life

Seed viability ranges from 36-76% over a 2 yr period.

Recommended seed storage conditions

In a cooler (cold stratification).

Propagation recommendations

Easily propagated by seeds and cuttings

Soil or medium requirements

Snow, mineral soil

Installation form

Seeds

Recommended planting density

2-3 m apart

Care requirements after installed

Water weekly, then no water after 2 months.

Normal rate of growth or spread; lifespan

Very slow growing. 7-28m tall at 100 yrs. Life span 800+ yrs.

Sources cited

<http://www.fs.fed.us/database/feis/plants/tree/tsumer/>

<http://nativeplantnetwork.org>

MacKinnon, Andy; Pojar, Jim. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. Lone Pine Publishing. 1994.

Silvics of NA, VI Conifers. Burns, Russel M. & Honkala, Barbara H. Technical Coordinators. FS. USDA.WADC. Dec 1990.

Data compiled by
Christer Lundstrom – June 12, 2003