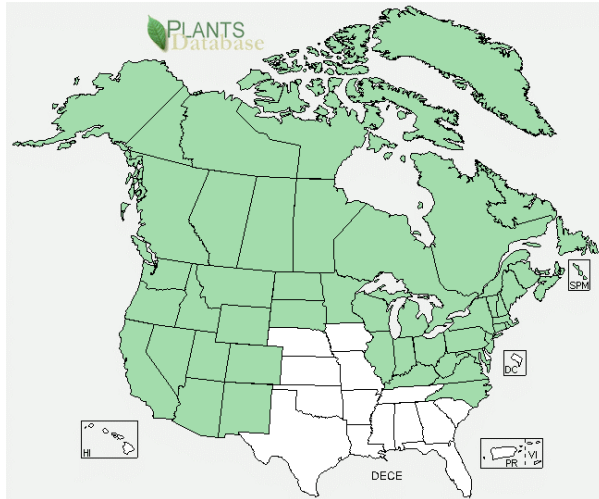
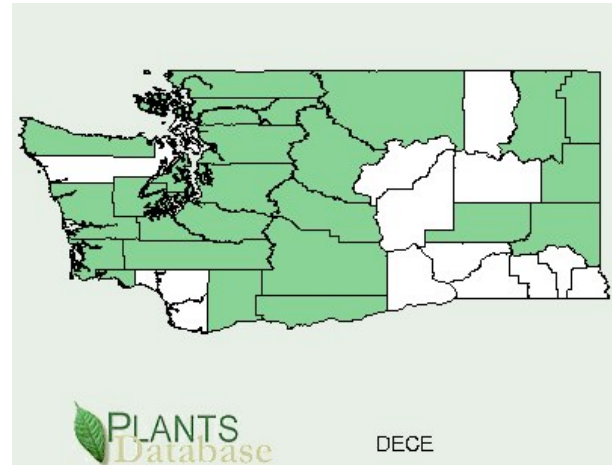


Plant Propagation Protocol for *Deschampsia cespitosa**
ESRM 412 – Native Plant Production

North America Distribution



Washington Distribution



Source: USDA PLANTS Database

TAXONOMY	
Family Names	
Family Scientific Name:	Poaceae
Family Common Name:	Grass
Scientific Names	
Genus:	<i>Deschampsia</i>
Species:	<i>cespitosa</i>
Species Authority:	(L.) Beauv
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	<i>Deschampsia caespitosa</i> (L.) Beauv <i>Aira caespitosa</i> L. <i>Aira cespitosa</i> L., orth. var. <i>Deschampsia bottnica</i> (Wahlenb.) Trin. <i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>genuina</i> (Rchb.) O.H. Volk, orth. var. <i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>glauc</i> a (C. Hartm.) C. Hartm., orth. var. <i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>orientalis</i> Hultén, orth. var. <i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>paramushirensis</i> (Honda) Tzvelev, orth. var. <i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>parviflora</i> (Thuill.) K. Richt., orth. var.

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	<p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>abbei</i> B. Boivin, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>alpicola</i> (Rydb.) A. Löve & D. Löve & Kapoor, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>arctica</i> Vasey, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>glauca</i> (C. Hartm.) C. Hartm., non Regel, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>intercotidalis</i> B. Boivin, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>littoralis</i> (Gaudin) K. Richt., orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>longiflora</i> Beal, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>mackenzieana</i> (Raup) B. Boivin, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>maritima</i> Vasey, orth. var.</p> <p><i>Deschampsia caespitosa</i> (L.) P. Beauv. var. <i>parviflora</i> (Thuill.) Coss. & Germ., orth. var.</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>bottnica</i> (Wahlenb.) Tzvelev</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>caespitosa</i> tufted hairgrass</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>genuina</i> (Rchb.) O.H. Volk</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>glauca</i> (C. Hartm.) C. Hartm.</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>obensis</i> (Rosh.) Tzvelev</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>orientalis</i> Hultén</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>paramushirensis</i> (Honda) Tzvelev</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>parviflora</i> (Thuill.) K. Richt.</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>abbei</i> B. Boivin</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>alpicola</i> (Rydb.) A. Löve & D. Löve & Kapoor</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>arctica</i> Vasey</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>bottnica</i> (Wahlenb.) Vasey</p> <p><i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>glauca</i> (C. Hartm.) C. Hartm., non Regel</p>
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	<i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>intercotidalis</i> B. Boivin <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>littoralis</i> (Gaudin) K. Richt. <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>longiflora</i> Beal <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>mackenzieana</i> (Raup) B. Boivin <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>maritima</i> Vasey <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>pallida</i> Gren. & Godr. <i>Deschampsia cespitosa</i> (L.) P. Beauv. var. <i>parviflora</i> (Thuill.) Coss. & Germ. <i>Deschampsia glauca</i> C. Hartm. <i>Deschampsia mackenzieana</i> Raup <i>Deschampsia obensis</i> Rosh. <i>Deschampsia paramushirensis</i> Honda <i>Deschampsia pumila</i> (Ledeb.) Ostenf. <i>Deschampsia sukatschewii</i> (Popl.) Ros
Common Name(s):	tufted hairgrass
Species Code (as per USDA Plants database):	DECA18
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	W. and N. Europe, N. Asia, Central and Eastern Asia, Africa, S. America and N. America ⁱ . See maps for distribution in North America and Washington.
Ecological distribution (ecosystems it occurs in, etc):	Coastal marshes to alpine meadows. Also occurs on woodland, moorland, riverbanks, fens and artificial habitats such as spoil heaps. ⁱⁱ
Climate and elevation range	Temperate zone, circumboreal. ⁱⁱⁱ In the Northern Hemisphere, it occurs from sea level to over 14,100 feet elevation. ^{iv} Southern limit of distribution to 20°C isotherm for June mean temperature. ^v Little sensitivity to a wide range of rainfall, atmospheric humidity and wind-exposure, although excluded from arid regions. ^{vi}
Local habitat and abundance; may include commonly associated species	In North America, <i>D. caespitosa</i> is found where soils are wet at least early in the growing season. ^{vii}
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late	Has a high tolerance of metal-contaminated soils, and thrives not only in nutrient-rich, poorly drained habitats but also in well-drained, nutrient-poor soils. ^{viii}

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successional)	<p>Wetland indicator status is FACW.^{ix}</p> <p>Can occur as a colonizer on disturbed sites, particularly in alpine and subalpine regions^x with its rough leaves and their high silica content, which makes the hair grass unpalatable for grazing animals.^{xi}</p> <p>Occurs naturally on both early and late successional alpine sites.^{xii}</p>
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	<p>Densely tufted perennial grass to 4 feet tall, culms (stems) are erect and 20-200 cm tall, leaves occur mostly on lower half of flowering stem, leaf blades flat or folded (to 1/5 inch wide) and ligule elongate (to 1/2 inch) found at junction of leaf blade and leaf sheath.^{xiii}</p> <p>Spikelets (<1/5 inch long) borne on long or short slender stalks.^{xiv}</p> <p>Life form is hemicryptophyte.^{xv} Tussocks overwinter in the vegetative state. Many leaves die-back after flowering during the autumn, some remain green and photosynthetically active through winter. Leaves tend to be short in winter.</p> <p>Reproduction is amphimictic. Apomixis in the form of vivipary can occur in autumn and flowering season by incompletely induced plants.^{xvi} Starts growth early in the spring, flowers from July to September, seeds mature August to September.^{xvii}</p> <p>Wind-pollinated.</p>
PROPAGATION DETAILS^{xviii}	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	near Moscow, Idaho
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 (plug)
Stock Type:	10 cu. in.

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Time to Grow (from seeding until plants are ready to be outplanted):	4 months
Target Specifications (size or characteristics of target plants to be produced):	Tight root plug in container
Propagule Collection (how, when, etc):	Seeds ripen in late June or early July in Pullman area. It is collected when inflorescence begins to dry and seeds are soft to hard sough stage before it shatters. Seeds can be stripped from the inflorescence or inflorescence can be clipped from the plant. Harvested seed is stored in paper bags at room temperature until cleaned. ^{xix}
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Seed color is grayish brown. Small amounts of seed are rubbed and cleaned with air column separator. Larger amounts are threshed with a hammermill and cleaned with air screen equipment. Clean seed is stored at 40°F and 40% relative humidity. ^{xx} 1,500,000 seeds/ lb (USDA 2006) ^{xxi} 1,250,000 to 1,500,000 seeds/ lb (Hassell 1996) ^{xxii}
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Dormancy may vary by ecotype. Laboratory germination is best with gibberillic acid and a 5 day prechill at 5° centigrade (Chirco & Turner 1986) ^{xxiii} . Cold storage and light may enhance germination (Walsh 1995) ^{xxiv} .
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	In January, seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell containers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in containers to allow deep watering. A thin level of pea gravel is applied to prevent seeds from floating.
Establishment Phase (from seeding to germination):	Growth medium is kept moist until germination occurs. Germination usually begins in 7 days and is complete in 12 days.
Length of Establishment Phase:	2 weeks
Active Growth Phase (from germination until plants are no longer actively growing):	Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients. Plants may require water every day during final part of active growth period.
Length of Active Growth Phase:	3 months
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 are moved to the cold frame in late March or early April, depending on weather conditions. They are watered every other day if weather is cool, and every day during hot, dry weather.
Length of Hardening Phase:	2-4 weeks

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Harvesting, Storage and Shipping (of seedlings):	Unavailable
Length of Storage (of seedlings, between nursery and outplanting):	Unavailable
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Transplanting occurs in late April or early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site. Survival in seed increase plantings without competing vegetation approaches 100% Transplanting into sites with existing vegetation may reduce survival and vigor depending on weather conditions following planting. Flowering and seed production occurs the year after transplanting.
Other Comments (including collection restrictions or guidelines, if available):	Unavailable.
INFORMATION SOURCES	
References (full citations):	See below
Other Sources Consulted (but that contained no pertinent information) (full citations):	See below
Protocol Author (First and last name):	Sonia Tien
Date Protocol Created or Updated (MM/DD/YY):	4/19/10

References:

ⁱ Skinner, David M. 2006. Propagation protocol for production of container *Deschampsia caespitosa* (L.) Beauv. plants (10 cu. in.); USDA NRCS - Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. Available at <http://www.nativeplantnetwork.org> (Accessed 20 April 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery

ⁱⁱ Kew Royal Botanic Gardens [Online]. *Deschampsia cespitosa*. Available at <http://www.kew.org/plants-fungi/Deschampsia-caespitosa.htm> [Accessed on 4/19/2010]

ⁱⁱⁱ Davy, A. J. *Deschampsia Caespitosa* (L. Beauv.) *Journal of Ecology*, Vol. 68 No. 3, Nov., 1980, pp. 1075-1096

^{iv} USDA Forest Service, "Deschampsia cespitosa" Available at <http://www.fs.fed.us/database/feis/plants/graminoid/desces/all.html> [Accessed on 4/19/2011]

^v See iii.

^{vi} See iii.

^{vii} See i

^{viii} See ii

^{ix} Tiner, Ralph W. 1987 "Plants of Salt and Brackish Marshes," *Field guide to tidal wetland plants of the northwestern United States and neighboring Canada*, pp. 202

^x See iv

^{xi} See ii

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- xii See iv
xiii See ii
xiv See viii
xv See ix
xvi See iii
xvii Utah State University “Tufted Hairgrass” Available online at <http://extension.usu.edu/range/Grasses/tuftedhairgrass.htm> [Accessed 4/19/2011]
xviii See I for all or most of the protocol information provided here.
xix See i
xx See i
xxi USDA, NRCS. 2006. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
xxii Hassell, Wendell, W. Rocky Beavers, Steve Ouellette, and Thomas Mitchell. 1996. Seeding Rate Statistics for Native and Introduced Species. USDI National Park Service and USDA Natural Resources Conservation Service. 25 pp.
xxiii Chirco, Ellen, and Terry Turnoer. 1986. Species without AOSA Testing Procedures. The Newsletter of the Association of Official Seed Analysts 60(2):2-66. Available online at [http://www.aosaseed.com/Species wo AOSA list plus adds.pdf](http://www.aosaseed.com/Species%20wo%20AOSA%20list%20plus%20adds.pdf). Updated November 11/10/03. [Accessed 4/19/2011]
xxiv Walsh, Roberta A. 1995. *Deschampsia cespitosa*. In: Fire Effects Information System, USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Available online at <http://www.fs.fed.us/database/feis/> [Accessed 4/19/2011]

Other Sources Consulted (but that pertained no important information):

Lawrence, William E. June 1954. *Some Ecotypic Relations to Deschampsia caespitosa*, Botanical Society of America Vol. 32, No. 6.

Pacific Northwest Natives *Tufted Hairgrass Deschampsia cespitosa* Available online at www.pacificnwnatives.com/Tuftedhairgrass.pdf [Accessed 4/20/2011]

Note: This template was modified by J.D. Bakker from that available at: <http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>

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