

Plant Propagation Protocol for *Festuca subulata*
ESRM 412 – Native Plant Production



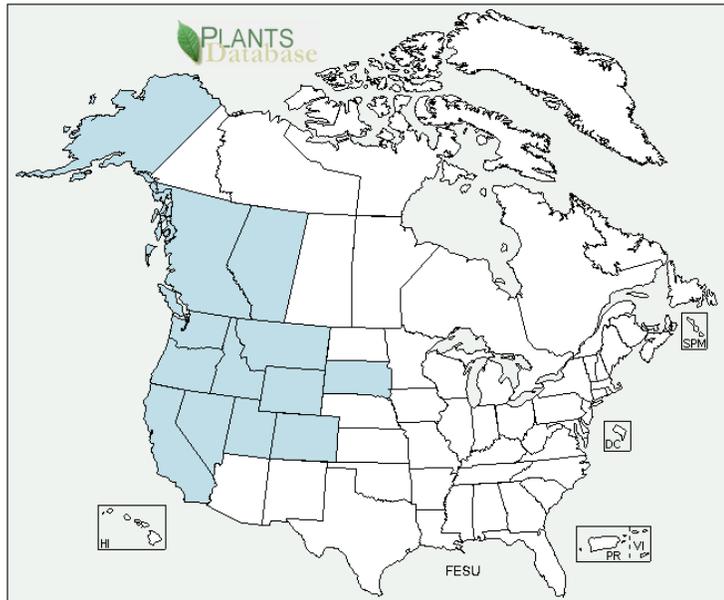
Image courtesy of A.S. Hitchcock, (1950) *Manual of the Grasses of the United States*

TAXONOMY	
Family Names	
Family Scientific Name:	<i>Poaceae</i>
Family Common Name:	Grass
Scientific Names	
Genus:	<i>Festuca</i>
Species:	<i>subulata</i>
Species Authority:	Carl Bernhard von Trinius
Variety:	N/A
Sub-species:	N/A
Cultivar:	N/A
Authority for Variety/Sub-species:	N/A
Common Synonym(s):	None
Common Name(s):	Bearded fescue
Species Code (as per USDA Plants database):	FESU

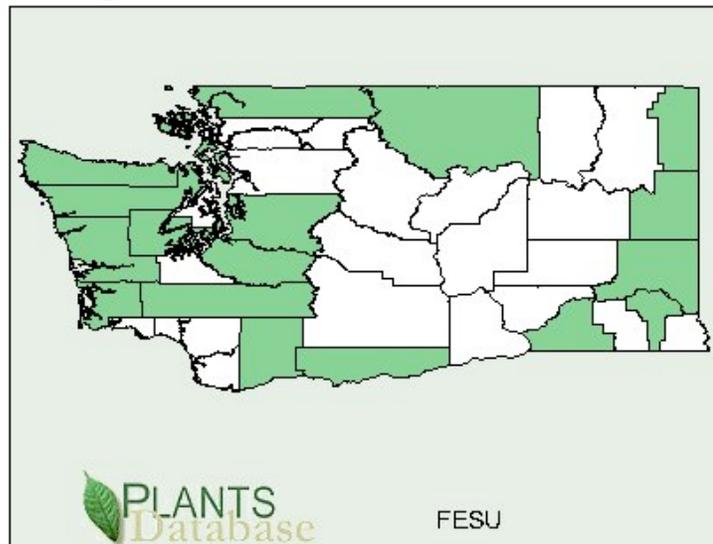
GENERAL INFORMATION

Geographical range (distribution maps for North America and Washington state)

North American Distribution:



Washington State Distribution:



Images courtesy of USDA Plants Database

Ecological distribution (ecosystems it occurs in, etc):

Found in moist to dry forest, riparian areas and meadows on the east and west sides of the Cascade Range (Hitchcock, et al, 1969).

Climate and elevation range

0 – 2,239 meters (Bay Science Foundation, 2009). Less than 2,500 meters (Smith & Aiken, 1993)

Local habitat and abundance; may include commonly associated species

Often grows with *Festuca subulifora* (crinkle-awn fescue) and can be easily misidentified, so care should be taken when collecting seeds not to mix the two species (Lorain, 1989). Other associations in the Pacific Northwest region include: sitka spruce, devils club,

	douglas-fir, western hemlock, red alder, vanilla-leaf, pacific silver fir, noble fir, alaska cedar, vine maple, red huckleberry, baldhip rose, salal, western fescue, blue wildrye, evergreen violet, twinflower, bunchberry, sweet-scented bedstraw, oceanspray, western sword fern and braken fern, among others (Esser, 1994). Provides habitat for deer, elk, and mountain beaver in the Mount Ranier National Park, and provides forage for grizzly bear in British Columbia (Esser, 1994)
Plant strategy type / successional stage:	Reproduces by seed and sprouting from rhizomes. It is a facultative seral species; often a pioneer species following disturbance (Esser, 1994). Shade tolerant, but not drought tolerant (Bay Science Foundation, 2009).
Plant characteristics:	Graminoid, perennial, grass, 3-5 flowered spikelets with awns from 7 – 17 mm (Hitchcock, et al, 1969). Erect and bunching; active growth occurring in spring and summer; blooming in late spring (Bay Science Foundation, 2009). Grows from short rhizomes, leaves are 10-30 cm long and 3-10 mm wide. Inflorescence 10-40 cm and drooping (Smith & Aiken, 1993)
PROPAGATION DETAILS	
Propagation Goal:	Plants, seeds
Propagation Method:	Seed. [Although <i>F. subulata</i> sprouts on rhizomes, there is no information available on vegetative propagation.]
Product Type:	Container (plug), propagules (seeds)
Time to Grow (from seeding until plants are ready to be outplanted):	No information is available, but a similar species <i>F. idahoensis</i> takes 5 months (from January to May) from seeding until outplanting (Skinner, 2007). <i>F. saximontana</i> only requires 2 months until transplanting (Butler & Frieswyk, 2001).
Target Specifications:	Approximately 35-120 cm in height (Smith & Aiken, 1993)
Propagule Collection:	Fruit is ripe during the summer (Bay Science Foundation, 2009). Similar species (<i>F. idahoensis</i>) is collected in mid-July when inflorescence begins to dry but before the seeds are dropped (Skinner, 2007). It is likely that this is also applicable to <i>F. subulata</i> , but a trial should be run with collection at 1-week intervals beginning in late June and concluding in early August to determine the optimum collection time for the specific region as climate and weather will affect seed ripening.
Propagule Processing/Propagule Characteristics:	400,000 seeds/lb (Bay Science Foundation, 2009).
Pre-Planting Propagule Treatments:	Seeds can be separated from a good deal of chaff in the field with course screens. One method is to attach a cloth to the underside of a screen and hand-rub the plant

	<p>material against the screen to separate the seeds from the chaff. The seeds will fall through the screen onto the cloth, and can be poured into a paper-bag for transport. This method works for many types of grass including <i>Fescue</i> (sp.) (Archibald and Dremann, 2004). Some sources maintain that no cold stratification is required (Bay Science Foundation, 2009), but other species within the <i>Festuca</i> genus have responded well to cold storage or after-ripening periods. For instance, <i>F. idahoensis</i> has been found to have higher germination rates after 1 month to 1 year of storage at 5°C and 40% humidity (Skinner, 2007). This can be accomplished by storing seeds from July when harvested until January when planted. <i>F. viridula</i> and <i>F. roemerii</i> have also been stored at low temperatures (0.5° - 3.5° C) prior to planting (Barner, 2009)</p>
Growing Area Preparation / Annual Practices for Perennial Crops:	<p>Prefers sandstone, shale or other conglomerate derived soils (Esser, 1994). Adapted to medium to course textured soils with pH of 5.8 – 7.4. Prefers moist soil and is not drought tolerant. (Bay Science Foundation, 2009) No information is available on propagation of <i>F. subulata</i>, but a similar species, <i>F. idahoensis</i> has had success in 10 cu. in. Ray Leach Supercell Cone-tainers with a head space of ¼ to ½ inch and a thin coating of course grit on the top. Trials should be established to test the applicability to <i>F. subulata</i> propagation.</p>
Establishment Phase (from seeding to germination):	<p>No information is available, but a similar species, <i>F. idahoensis</i> should be planted in January in the greenhouse. Germination begins in 6-7 days. Planting medium should be watered deeply and kept moist (Skinner, 2007).</p>
Length of Establishment Phase:	<p>No information is available, but similar species, <i>F. idahoensis</i> germinates completes in 12-14 days (Skinner, 2007).</p>
Active Growth Phase (from germination until plants are no longer actively growing):	<p>No information is available, but similar species, <i>F. idahoensis</i> has an active growth period of 60-75 days. Irrigation should take place every other day with fertilizer applied once a week (Skinner, 2007).</p>
Length of Active Growth Phase:	<p>No information is available, but similar species, <i>F. idahoensis</i> has an active growth period of 60-75 days (Skinner, 2007).</p>
Hardening Phase:	<p>No information is available, but similar species, <i>F. idahoensis</i> should be moved to a hoophouse or other protected outdoor site in late March or early April and watered every other day (Skinner, 2007).</p>
Length of Hardening Phase:	<p>No information is available, but similar species, <i>F.</i></p>

	<i>idahoensis</i> has a hardening period of 2-4 weeks before outplanting (Skinner, 2007).
Harvesting, Storage and Shipping (of seedlings):	No information available
Length of Storage (of seedlings, between nursery and outplanting):	No information available
Guidelines for Outplanting / Performance on Typical Sites:	No information available, but similar species <i>F. idahoensis</i> should be transplanted outdoors in early May in 1.5" (3-4cm) holes. The Pullman Plant Materials Center in Pullman, WA had an average survival rate of 85% when <i>F. idahoensis</i> was outplanted in empty seed increase beds, with varying levels of success when outplanting in sites with competing vegetation. Time period before plants produced flowers and seeds was one year (Skinner, 2007).
INFORMATION SOURCES	
Protocol Author (First and last name):	Brooke A. Cassell
Date Protocol Created or Updated (MM/DD/YY):	05/11/2010

References:

- Archibald, C., & Dremann, C. (2004). Cleaning grass seeds . *Native Plants* , Retrieved from <http://www.nativeplantnetwork.org/Journal/ArticleAbstract.aspx?ArticleID=149>
- Barner, Jim 2009. Propagation protocol for production of *Festuca viridula* Vasey seeds; USDA FS - R6 Bend Seed Extractory, Bend, Oregon. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 11 May 2010). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
- The Bay Science Foundation. (2009, July 1). *Zipcodezoo.com; Festuca subulata (bearded fescue)*. Retrieved from http://zipcodezoo.com/Plants/F/Festuca_subulata/
- Brummitt, R.K., & Powell, C.E. (Ed.). (1992). *Authors of plant names*. Kew, Great Britain: The Royal Botanic Gardens, Kew.
- Butler, Jennifer; Frieswyk, Christin. 2001. Propagation protocol for production of *Festuca saximontana* seeds; USDI NPS - Rocky Mountain National Park, Estes Park, Colorado. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 11 May 2010). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
- Esser, L.L. USDA Forest Service, (1994). *Festuca subulata. in: fire effects information system* Missoula, MT: Rocky Mountain Research Station, Fire Sciences Laboratory. Retrieved from <http://www.fs.fed.us/database/feis/>
- Lorain, C.C. Idaho Department of Fish and Game, Natural Heritage Section, Nongame/Endangered Wildlife Program, Bureau of Wildlife. (1989). *Field investigation of festuca subuliflora (crinkle-awn fescue), a region 1 sensitive species, on the nez perce and clearwater national forests* Boise, ID: Cooperative Challenge Cost Share Program. Retrieved from http://fishandgame.idaho.gov/cdc/cdc_pdf/lorac89b.pdf
- Hitchcock, C.L., Cronquist, A., Ownbey, M., & Thompson, J.W. (1969). *Vascular plants of the Pacific Northwest, Part 1*. Seattle, WA: University of Washington Press.
- ITIS. (2010). *ITIS report*. Retrieved from <http://www.itis.gov/servlet/SingleRpt/SingleRpt>
- Smith, J.P., Jr., & Aiken, S.G. (1993). *Poaceae grass family; Festuca fescue; F. subulata trin. bearded fescue*. Informally published manuscript, Jepson Flora Project; Treatment from the Jepson Manual, University of California, Berkeley, CA. Retrieved from http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?8738,9015,9027
- USDA, NRCS. 2010. The PLANTS Database (<http://plants.usda.gov>, 22 April 2010). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Images:

USDA-NRCS PLANTS Database / Hitchcock, A.S. (rev. A. Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC.

Other Sources Consulted (but that contained no pertinent information):

- Darke, R., & Griffiths, M. (Ed.). (1994). *The New Royal Horticultural Society dictionary: manual of grasses*. Portland, OR: Timber Press.
- Franklin, J.F., & Dyrness, C.T. (1988). *Natural vegetation of oregon and washington*. Oregon, USA: Oregon State University Press.

Skinner, David M. 2007. Propagation protocol for production of container *Festuca idahoensis* Elmer plants (); USDA NRCS - Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 11 May 2010).
Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
TWC Staff, . (2007, 01 01). *University of texas at austin; lady bird johnson wildflower center*. Retrieved from http://www.wildflower.org/plants/search.php?search_field=Festuca