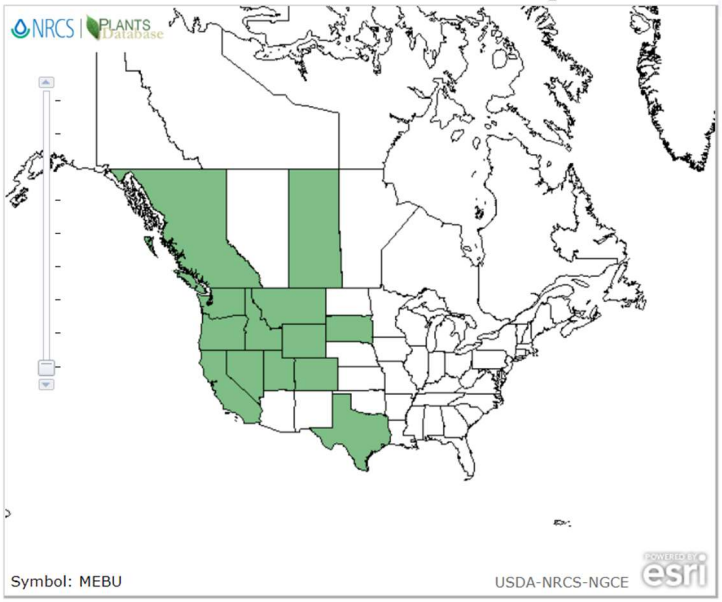
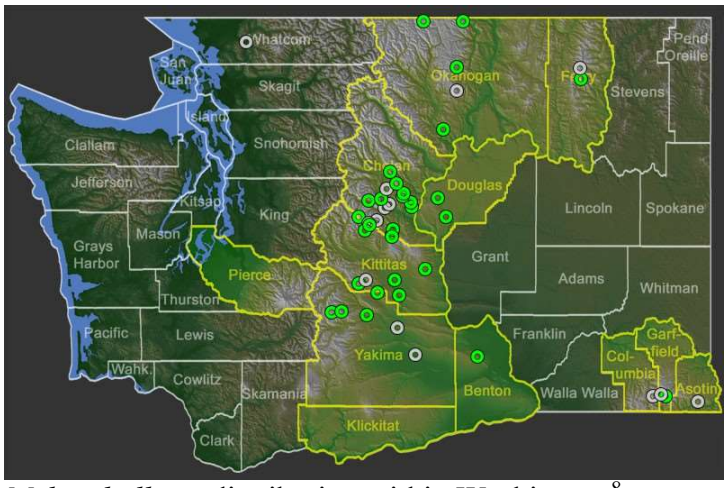
Plant Propagation Protocol for *Melica bulbosa*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/MEBU.pdf

Melica bulbosa[2] ©2005 Steve Matson

TAXONOMY	
Plant Family	
Scientific Name	Poaceae[1]
Common Name	Grass family[1]
Species Scientific Name	
Scientific Name	*Melica bulbosa* Geyer ex Porter & J.M. Coult.[1]
Varieties	n/a
Sub-species	n/a
Cultivar	n/a
Common Synonym(s)	*Bromelica bulbosa* (Geyer ex Porter & J.M. Coult.) W.A. Weber[1] *Melica bella* Piper[1] *Melica bella* Piper ssp. *intonsa*[1] *Melica bulbosa* Geyer ex Porter & J.M. Coult. var. *inflata* (Bol.) Boyle[1] *Melica bulbosa* Geyer ex Porter & J.M. Coult. var. *intonsa* (Piper) M. Peck[1] *Melica inflata* (Bol.) Vasey[1]
Common Name(s)	Oniongrass[1]

Species Code (as per USDA Plants database)	MEBU[1]
GENERAL INFORMATION	
Geographical range	Native to much of the American West and parts of southwestern Canada[1]  *Melica bulbosa* distribution[1]  *Melica bulbosa* distribution within Washington[8]
Ecological distribution	Occurs in rocky, shallow soils at high elevations with snowfall[3]
Climate and elevation range	Elevation range of 920 to 3350m, temperature range of 26 to 35 °C, 51 to 323 cm annual precipitation[2]
Local habitat and abundance	Associates with wild onion, members of Liliaceae, camas, mules ears, cinquefoil, geranium, and others in overgrazed flats[3]
Plant strategy type / successional stage	Stress tolerator- *Melica bulbosa* tolerates snowfall, shallow soil, and high elevations,[3] as well as low moisture and full sun.[5]
Plant characteristics	Grass, long-lived perennial[3]

	Has few narrow leaves, grows to 1-2' tall, grows in loose bunches, has bulb-like roots, and has purplish flowers pointing straight up. Grains do not have awns.[3]
PROPAGATION DETAILS (Container method)	
Ecotype	n/a
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container[4*]
Stock Type	n/a
Time to Grow	2[4*] -6[15*] months
Target Specifications	Mature plants will be erect bunchgrass, 1-2' tall[6]
Propagule Collection Instructions	*Melica* seeds collected between April [16*] and August.[7*]
Propagule Processing/Propagule Characteristics	200,000 seeds per pound[1], mature inflorescences brown with tan seeds[16*]
Pre-Planting Propagule Treatments	Stratification at 32˚F[7*]-35˚F[15*] for 14[16*]-80[7*] days.
Growing Area Preparation / Annual Practices for Perennial Crops	Germinated in flats,[4*] leachtubes,[16*] or cells with 3-4 seeds per cell with coarse processed bark and composted pine bark medium, lightly covered with 1/16-1/8" diameter granite poultry grit[15*]
Establishment Phase Details	Germination rates are typically quite low for *Melica bulbosa.*[7] Keep at 70˚F and water for 20 seconds every 30 minutes during daylight hours.[15*]
Length of Establishment Phase	7[15*]-21[16*] days
Active Growth Phase	Once plant has 3 leaves, plant in 3" peat pots with 3-4 plants per pot.[4*] Watering can be reduced to once daily, and fertilization occurs via means of fertigation on a biweekly basis.[15*]
Length of Active Growth Phase	Growing season 0-6 months,[2] active growth phase typically takes 2-4 months[15*]
Hardening Phase	Move plugs to a protected outdoor site 1-2 weeks prior to outplanting and cease fertigation.[15*]
Length of Hardening Phase	1-2 weeks[15*]
Harvesting, Storage and Shipping	Plugs placed 12" apart in rows spaced 40" apart and irrigated with at least 1" of water.[15*] If grasses are growing in bunches, they can be uprooted, divided, and transplanted into outplanting sites.[4*]
Length of Storage	Information not found.

Guidelines for Outplanting / Performance on Typical Sites	*Melica bulbosa* thrives in loams and fine textured soils.[6] Plant in early January in plots which have been burned the previous winter. Almost all transplants survive.[4*] Flowers appear May through July.[8] *Melica bulbosa* produces few seeds of low germinability.[7] Seeds mature in mid-August to early September.[10] If harvesting, limit utilization to ½ of yield. Limit animal grazing during growing season.[9]
Other Comments	*Source may not be directly relevant to *Melica bulbosa.* Source 4 references an experiment growing grasses native to California, including some in the *Melica* genus. Source 7 pertains primarily to closely related *Melica spectabilis,* with limited commentary on *Melica bulbosa.* Source 11 is about *Melica harfordii,* 14 about *Melica torreyana,* 15 about *Melica mutica,* 16 about *Melica imperfecta,* and 13 about *Melica spectabilis.* The *Melica* genus is lacking overall in propagation literature,[7,12] and propagation is often unsuccessful.[4,10,13]
PROPAGATION DETAILS (Direct sowing method)	
Ecotype	n/a
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Seeds[11*]
Stock Type	n/a
Time to Grow	Approx. 7 months[11*,8]
Target Specifications	n/a
Propagule Collection Instructions	*Melica* seeds collected between April [16*] and August.[7*]
Propagule Processing/Propagule Characteristics	200,000 seeds per pound,[1] mature inflorescences brown with tan seeds[16*]
Pre-Planting Propagule Treatments	No stratification required[11*]
Growing Area Preparation / Annual Practices for Perennial Crops	Plant in fall 0.6-1cm deep and cover with sawdust mulch[11*]
Establishment Phase Details	Maximum of 46% germination rate[14*]
Length of Establishment Phase	141 days[14*]
Active Growth Phase	Information not found.
Length of Active Growth Phase	Information not found.
Hardening Phase	Information not found.
Length of Hardening Phase	Information not found.
Harvesting, Storage and Shipping	n/a
Length of Storage	n/a

Guidelines for Outplanting / Performance on Typical Sites	Flowers appear May through July.[8] *Melica bulbosa* produces few seeds of low germinability.[7] Seeds mature in mid-August to early September.[10] If harvesting, limit utilization to ½ of yield. Limit animal grazing during growing season.[9]
Other Comments	*Source may not be directly relevant to *Melica bulbosa.* Source 4 references an experiment growing grasses native to California, including some in the *Melica* genus (*Melica torreyana* and *Melica californica)*. Source 7 pertains primarily to closely related *Melica spectabilis,* with limited commentary on *Melica bulbosa.* Source 11 is about *Melica harfordii,* 14 about *Melica torreyana,* 16 about *Melica imperfecta,* and 13 about *Melica spectabilis.* The *Melica* genus is lacking overall in propagation literature,[7,12] and propagation is often unsuccessful.[4,10,13] An unpublished phylogeny was consulted for determining relatedness of *Melica* species.[17]

INFORMATION SOURCES

References

[1] USDA NRCS National Plant Data Team. (n.d.). *Melica bulbosa* Geyer ex Porter & J.M. Coult. oniongrass. Retrieved April 23, 2020, from https://plants.usda.gov/core/profile?symbol=MEBU

[2]CalFlora. (n.d.). *Melica Bulbosa*. Retrieved May 6, 2020, from https://www.calflora.org/entry/plantchar.html?crn=5390

[3]Oregon State University Extension Service. June 1973. Oniongrass (*Melica bulbosa). Range Plant Leaflet*, 15–16.

[4]McClaran , M. P. (1981). PROPAGATING NATIVE PERENNIAL GRASSES . *Fremontia*, *9*(1), 21–23.

[5]Bureau of Planning and Sustainability. Portland Plant List (June 2016). City of Portland, OR. Retrieved May 21, 2020, from https://beta.portland.gov/sites/default/files/2018-12/Portland_Plant_List_2016_Update_Final2.pdf

[6]Banner, R. E., Pratt, M., & Bowns, J. E. (2011). *Grasses and grasslike plants of Utah: a field guide* (2nd ed.). Logan, UT: Utah State University Extension. Retrieved May 7, 2020, from https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=2188&context=extension_curall

[7] St. John, L., and D. Tilley. (2012). Plant guide for Purple oniongrass (*Melica spectabilis*) USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, Idaho 83210

[8]WTU Herbarium, Burke Museum, & University of Washington. (2020). *Melica bulbosa*. Retrieved May 21, 2020, from https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Melica bulbosa

[9]Utah State University. (2017). Oniongrass- Range Plants of Utah. Retrieved May 7, 2020, from https://extension.usu.edu/rangeplants/grasses-and-grasslikes/oniongrass

[10]Sampson, A. W. (1924). *Native American forage plants*. New York: Wiley. Retrieved May 22, 2020, from https://babel.hathitrust.org/cgi/pt?id=mdp.39015031636973&view=1up&seq=11

[11]Rose, R., Chachulski, C. E. C., & Haase, D. L. (1998). *Propagation of Pacific Northwest native plants*. Corvallis: Oregon State University Press.

[12]Young, J. A., & Young, C. G. (1995). *Seeds of wildland plants: collecting, processing and germinating*. Portland, OR: Timber Press.

[13]Schultz, K. M., & Goodson, D. G. (1991). Seed Conditioning and Plant Propagation of Grant Teton National Park Plant Materials. In *Proceedings America Society of Mining and Reclatmation* (pp. 521–526). Durango, CO. doi: 10.21000JASMR91020521

[14]Mirov, N. T., & Kraebel, C. J. (1937). Collecting and Propagating the Seeds of California Wild Plants. *Forest Research Notes: California Forest and Range Experiment Station*.

[15]Vandevender, John (2011). Propagation protocol for production of container Melica mutica Walter plants (1+0 container plug); USDA NRCS - Appalachian Plant Materials Center, Alderson, West Virginia. In: Native Plant Network. Moscow, ID, University of Idaho, College of Natural Resources, Forest Research Nursery. Retrieved May 22, 2020 from http://www.nativeplantnetwork.org

[16]Young, Betty. (2001). Propagation protocol for production of Container (plug) *Melica imperfecta* Trin. plants Leach Tube; San Francisco, California. In: Native Plant Network. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 22, 2020, from http://NativePlantNetwork.org (accessed 2020/05/22).

	[17]Carlson, M., Brightly, W., Strömberg, C. 2019. [*Melica* phylogeny]. Unpublished figure.
Other Sources Consulted	Scribner, F. (1885). A Revision of the North American Melicæ. *Proceedings of the Academy of Natural Sciences of Philadelphia,37*, 40-48. Retrieved May 21, 2020, from www.jstor.org/stable/4061087 Scribner, F. L., & Tweedy, F. (1886). Grasses of Yellowstone National Park. *Botanical Gazette*, XI, 169–178. Jones, M. E. (1912). *Contributions to Western Botany*, *14*, 5. Retrieved May 22, 2020, from https://www.biodiversitylibrary.org/page/10608619#page/3/mode/1up Kuhnlein, H. V., & Turner, N. J. (1991). *Traditional plant foods of Canadian indigenous peoples: nutrition, botany and use*. Philadelphia: Gordon and Breach. McArthur, E. D., Romney, E. M., Smith, S. D., & Tueller, P. T. (1989). Proceedings- Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management. In *Proceedings- Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management*. Ogden, UT: Intermountain Research Station, Forest Service, U.S Department of Agriculture. Standley, P. C. (1921). *Flora of Glacier National Park, Montana*. Washington, D.C.: Smithsonian Institution, United States National Museum. Mansfield, D. H. (2010). Vascular flora of the Owyhee River watershed in Oregon. *Journal of the Idaho Academy of Science*, *46*(2), 1+. Retrieved May 21, 2020, from https://link-gale-com.offcampus.lib.washington.edu/apps/doc/A248659043/AONE?u=wash_main&sid=AONE&xid=04b9616b Steinfeld, D., & Archibald, C. (n.d.). Propagating Native Grass Seed and Seedlings. *Seed Propagation*, 32–37. Retrieved from https://www.roguenativeplants.org/wp-content/uploads/2019/02/Propagating_Native_Grass_Seed_and_Seedlings_Steinfeld.pdf Quattrocchi, U. (2006). *Crc World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology* (Vol. 1). Boca Raton, FL: CRC Press. Love, S.L., & Akins, C.J. (2019). Fourth summary of the native seed germination studies of Norman C Deno: species with names beginning with letters L through O. Native Plants Journal 20(3), 279-304. https://www.muse.jhu.edu/article/746689. Archuleta, J.G., & Baxter, E.S. (2008). Subsoiling promotes native plant establishment on compacted forest sites. *Native Plants Journal* 9(2), 117-122. https://www.muse.jhu.edu/article/242650.
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Date Protocol Created or Updated	June 5, 2020