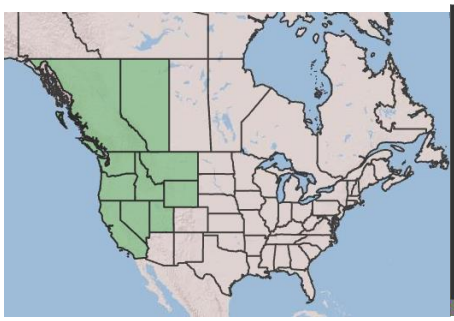
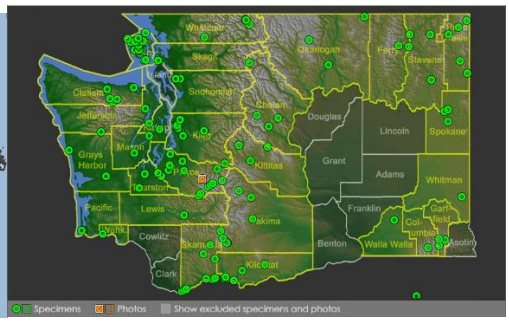
Plant Propagation Protocol for *Bromus Vulgaris*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2024*/*BRVU.pdf*

TAXONOMY	
Plant Family	
Scientific Name	Poaceae
Common Name	Grass
Species Scientific Name	
Scientific Name	*Bromus Vulgaris* (Hook.) Shear.
Varieties	*Bromus Vulgaris* var. *eximius* Shear. *Bromus Vulgaris* var. *robustus* Shear.
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Bromopsis vulgaris* (Hook.) Holub Bromus eximius[8]
Common Name(s)	Columbia Brome
Species Code (as per USDA Plants database)	BRVU
GENERAL INFORMATION	
Geographical range	Columbia Brome occurs from British Columbia south to central California and the Sierra Nevada. Its range extends east to southwestern Alberta, Montana, Wyoming, and Utah.[5]  (USDA)  (Burke Herbarium)
Ecological distribution	Grows in moist to dry conditions in both shaded and open forest[5], equally distributed between maritime and inland regions. Commonly occurs on nitrogen-rich soils within mountain, boreal, and cool mesothermal climates. Occurrence typically decreases with elevation. Common in broadleaf forests with scattered distribution in coniferous forest. Columbia brome is found in Douglas-fir, Ponderosa pine, Western white pine, Fir – spruce, Hemlock - Sitka spruce, Larch, Lodgepole pine,

	Redwood, Western hardwoods, Mountain grasslands, and Mountain meadows ecosystems. [8]
Climate and elevation range	Columbia brome generally occurs in climates with cool, wet winters and warm, dry summers at elevations from sea level to lower subalpine mountain areas.[5]
Local habitat and abundance	Columbia brome is very common in both disturbed and undisturbed forest environments.[2] Common understory associates include huckleberry (Vaccinium spp.), willow (Salix spp.), manzanita (Arctostaphylos spp.), honeysuckle (Lonicera spp.), swamp currant (Ribes lacustre), sticky currant (Ribes viscosissimum), prince's pine (Chimaphila umbellata), Saskatoon serviceberry (Amelanchier alnifolia), among others.[5]
Plant strategy type / successional stage	Successional status: Facultative seral speices[5] Columbia brome occurs in many successional stages, being found in clearcuts, seral shrubfields, and in mature undisturbed forests. In postfire conditions it is considered a ground residual colonizer as it reestablishes after disturbance from seed already stored in soil.[5] In recently harvested forests, it experiences competition from invasive false-brome (Brachypodium sylvaticum) a dominant understory species.[7]
Plant characteristics	Columbia brome is a non-rhizomatous perennial bunchgrass (graminoid) with slender hollow culms 24-48 in (60-120cm) in length. Branches are slender and spreading with flat leaf blades. Inflorescence is an open panicle containing few flowered spikelets.[5] May be confused for fringed brome (*B. cilicatus)* or Orcutt's brome (*B. orcuttianus)* which are distinguished by their shorter awns and shorter branches with narrower inflorescence respectively.[3]
PROPAGATION DETAILS: FROM SEED	
Ecotype	N/A
Propagation Goal	Seed increase[1]
Propagation Method	Seed[1]
Product Type	Propagules[1]
Stock Type	Seed
Time to Grow	2 years[1]
Target Specifications	Clean seed lots containing little to no noxious weed seed with germination/viability 60% or greater.[1]
Propagule Collection Instructions	Seeds are easily collected by hand but shatter readily at maturity making collection more difficult.[2] Seeds can be hand stripped from plants and stored in cloth or paper bags out of direct sunlight. Occasionally, *B. vulgaris* stands are infested with smut fungus; these seeds should be avoided.[1]

Propagule Processing/Propagule Characteristics	Seeds should be dried and may be deawned (hairs or bristles attached to seeds removed) and cleaned either mechanically or with 3/16" screens. Awns can be separated from cleaned seed via air screening with low-medium air flow. Seed density with awns and seed hulls intact is approximately 95,000 and 108,000 (+/- 20%) with hulls removed.[2]
Pre-Planting Propagule Treatments	None, seed dormancy has not been reported for *B. vulgaris.*[2]
Growing Area Preparation / Annual Practices for Perennial Crops	In spring, seeds can be sowed into prepared outdoor seed beds with 12" row spacing at 60-86 PLS/ft, 1/8" deep. Experimental treatments where seed beds were sprayed with charcoal slurry (carbon-banding) after sowing achieved moderately better establishment.[1]
Establishment Phase Details	Initial establishment is typically good; however, seedlings are prone to being overtaken by other weeds that may be present in seed lots. Periodic weeding by hand or rotary tiller is required to control grassy weeds. No selective herbicides are known to control weeds without injury to *B. vulgaris.*[1]
Length of Establishment Phase	21 days.[1]
Active Growth Phase	Supplemental irrigation is necessary, up to 1" per week under drier conditions. Weeding should be continued as necessary. This may include treatment with broadleaf herbicide and spot applications of glyphosate. Established fields should be treated 2-3 times early in active growth period with fungicide such as propiconazole and/or chlorothalonil at label rates to control rust fungus.[1]
Length of Active Growth Phase	2-3 months.[1]
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Seeds are hand harvested in the same process as initial collection. Seeds should then be dried and deawned in the same process described above. Seeds should be stored in cloth or paper bags in a dry cooler.[1]
Length of Storage	Seeds are relatively short lived (nearly 0% viability after 4-5 years)[1]
Guidelines for Outplanting / Performance on Typical Sites	Seeds can be simply surface-sown at a rate of 35 PLS/sq ft to moderate success. Greater long-term performance can be achieved by hand tilling plots, sowing with slow-release fertilizer and peat moss, and with the addition of erosion control blanketing. This process was found to provide a large increase in plant density after 1-2 years (stand density of 27.5/sq ft with treatment, 14/sq ft without).[1]

Other Comments	N/A
INFORMATION SOURCES	
References	1. Barner, J. (2009). *Propagation protocol for production of Propagules; Bromus vulgaris (Hook.) Shear seeds*. Native Plant Network, USDA, NRCS. URL: https://www.nrcs.usda.gov/plantmaterials/orpmcmt9960.pdf (Accessed 5.10.24) 2. Darris, D. (2017). *Columbia Brome (Bromus Vulgaris): Plant Fact Sheet*. Plant Materials Center, USDA, NRCS. URL: https://plants.usda.gov/DocumentLibrary/factsheet/pdf/fs_brvu.pdf (Accessed 05.10.24) 3. MacKinnon, A., & Pojar, J. (2016). *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska*. Partners Publishing. 4. USDA NRCS National Plant Data Team. *Bromus vulgaris (Hook.) Shear*. USDA PLANTS database. URL: https://plants.usda.gov/home/plantProfile?symbol=BRVU (Accessed 05.10.24) 5. Walsh, R. A. (2017). *Bromus vulgaris*. Fire Effects Information System (FEIS), USDA, USFS, Rocky Mountain Research Station, Fire Sciences Laboratory. URL: https://www.fs.usda.gov/database/feis/plants/graminoid/brovul/all.html# (Accessed 05.10.24) 6. Knoke, D., & Giblin, D. (2024). *Bromus vulgaris*. Burke herbarium image collection. URL: https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Bromus%20vulgaris (Accessed 05.14.24) 7. Kaye, T. (2003). *Invasive Plant Alert: False Brome.* False Brome Working Group, USDA, BLM, Institute for Applied Ecology, The Nature Conservancy. URL: https://appliedeco.org/wp-content/uploads/brsybrochure.pdf 8. Klinkenberg, Brian. (Editor) 2020. E-Flora BC: Electronic Atlas of the Plants of British Columbia. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. URL: https://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Bromus%20vulgaris&noTransfer=0 (Accessed 05.20.24)
Other Sources Consulted	Flora of North America Editorial Committee. (2007). *Flora of North America north of Mexico. volume 24 Magnoliophyta: Commelinidae (in part): Poaceae,* Oxford University Press.

	Zimmerman, G. T.; Neuenschwander, L. F. (1984). *Livestock grazing influences on community structure, fire intensity, and fire frequency within the Douglas-fir/ninebark habitat type*. Journal of Range Management. 37(2): 104-110.
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