Plant Propagation Protocol for *Agrostis variabilis*

ESRM 412: Native Plant Production

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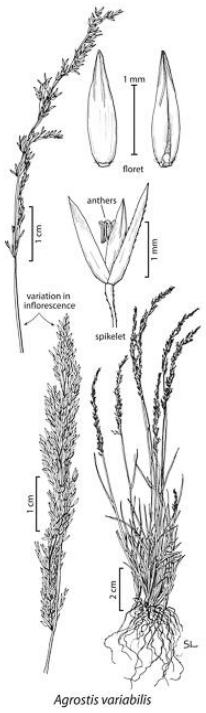
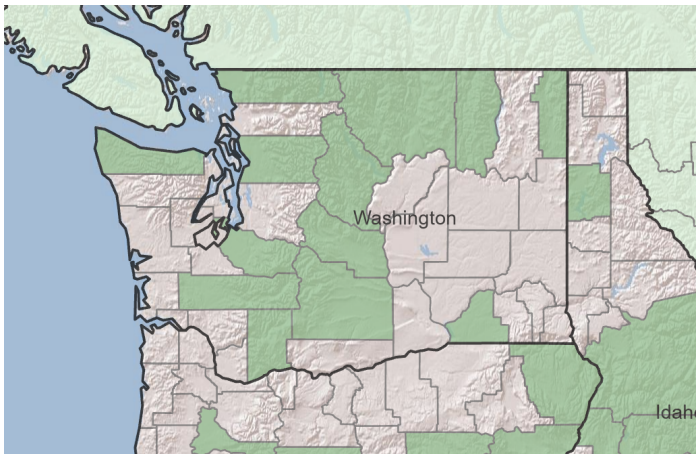
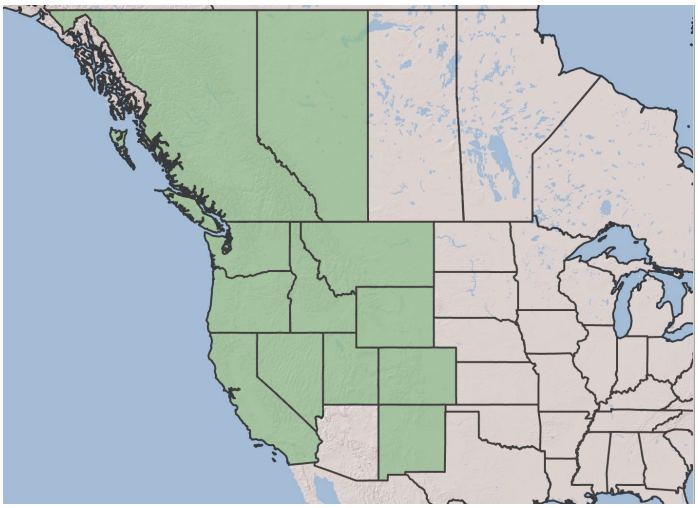


Source: Open Herbarium[5]

Source: Burke Herbarium[1]

TAXONOMY	
Plant Family	
Scientific Name	Poaceae
Common Name	Grass family
Species Scientific Name	

Scientific Name	*Agrostis variabilis* Rydb.
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Agrostis rossiae*[2]
Common Name(s)	Mountain Bentgrass
Species Code (as per USDA Plants database)	AGVA
GENERAL INFORMATION	
Geographical range	Washington State Distribution 

	North American Distribution  Source: USDA[2]
Ecological distribution	Found in alpine and subalpine meadows, forests, and wet areas along rocky streams and talus slopes[3]
Climate and elevation range	Grows in alpine and subalpine zones, at elevations up to 4000 m[5]
Local habitat and abundance	Local habitat is primarily alpine or subalpine rocky slopes; often found growing in rock crevices and dry soil[9] More abundant when found near water or when growing in meadows or high elevation forests[3]
Plant strategy type / successional stage	Tolerant of non-ideal soil conditions due to ability to colonize rocky areas on high elevation slopes[3] *Agrostis rossae*, considered to be the same species, is very tolerant of alkaline soils and high temperatures, allowing this grass to successfully spread in and near geothermal springs[8]
Plant characteristics	Perennial graminoid; grows in tufts; culms are erect and approximately 5-30 cm; basal leaves that form dense tufts; spikelets are lanceolate, purplish green in coloration[5]
PROPAGATION DETAILS	

Ecotype	*A. variabilis* prefers a cool, humid environment; this species is very widespread so there exists no particular ecotype in propagation resources[1]
Propagation Goal	Seedlings
Propagation Method	Seed
Product Type	Direct seeding, bareroot
Stock Type	N/A
Time to Grow	No information for this species.
Target Specifications	Height of about 15-30 cm; 3-7 cm long blades[5]; robust enough to survive outplanting
Propagule Collection Instructions	Flowers bloom around July to August[7] and the seed period is in the late summer/early fall which is when collection should be done.
Propagule Processing/Propagule Characteristics	Seeds per gram: 22,000-30,000[4] Seeds are easily collected by hand[4]
Pre-Planting Propagule Treatments	No need for stratification or treatment. *Agrostis* seeds can be stored in a cold, dry environment for up to one year while maintaining viability[4]
Growing Area Preparation / Annual Practices for Perennial Crops	Preferably establish seeds in loamy soil; plant at a depth of about 0-¼ inch into a smooth, firm, well-drained, weed-free soil bed[6]

Establishment Phase Details	Seeding Density: Unknown for this specific species; recommended 60-100 seeds per linear meter for *Agrostis* genus[4]
Length of Establishment Phase	Germination should be expected within 7-10 days[4]
Active Growth Phase	Actively grows from late spring to early fall in the wild; several weeks of short, frequent watering is required if there is a lack of precipitation to maintain proper moisture in the growing medium[6]
Length of Active Growth Phase	2-3 growing seasons[6]
Hardening Phase	Information not available
Length of Hardening Phase	Information not available
Harvesting, Storage and Shipping	Information not available
Length of Storage	Information not available
Guidelines for Outplanting / Performance on Typical Sites	Seedlings generally have low vigor, with seeding often resulting in poor stands; however, once established, stands of *Agrostis* will spread readily and persist for many years[6]
Other Comments	Agrostis has excellent value as a grazing crop for livestock, and is often planted in mixed stands in this context[4] Reproduces primarily by seed but also can spread vegetatively via runners[4]

	Due to rapid germination and high germination capacity, Agrostis is a good candidate for environmental restoration projects[4]
INFORMATION SOURCES	
References	[1] *Agrostis Variabilis - Burke Herbarium Image Collection*, burkeherbarium.org/imagecollection/taxon.php?Taxon=Agrostis+variabilis. Accessed 2 May 2023. [2] "Agrostis Variabilis Rydb." *USDA Plants Database*, plants.usda.gov/home/plantProfile?symbol=AGVA. Accessed 2 May 2023. [3] Amme, David. "California Agrostis (Bentgrass)" https://cnga.org/resources/Documents/Bibliographies%20and%20Articles/Amme%20Articles/californiaagrostis.pdf [4] "Growing and Using Native Plants in the Northern Interior of B.C." *Grasses*, www.env.gov.bc.ca/fia/documents/native_seed_manual/7agrostis_exarata.pdf. Accessed 2 May 2023. [5] Harvey, M.J. "Agrostis Variabilis." *Open Herbarium: An Open Vascular Plant Herbarium Network*, openherbarium.org/taxa/index.php?taxauthid=1&taxon=630393&clid=135. Accessed 2 May 2023. [6] Hoag, Chris J. "Description, Propagation, and Establishment of Wetland-Riparian Grass and Grass-Like Species in the Inter-Mountain West." *Natural Resources Conservation Service Boise, Idaho – Salt Lake City, Utah*, Oct. 2011, www.nrcs.usda.gov/plantmaterials/idpmctn10749.pdf.

	[7] “Plant Database.” *Lady Bird Johnson Wildflower Center - The University of Texas at Austin*, www.wildflower.org/plants/result.php?id_plant=AGVA. Accessed 2 May 2023. [8] “Ross’s Bentgrass.” *National Parks Service*, www.nps.gov/yell/learn/nature/ross-s-bentgrass.htm#:~:text=A%20unique%20grass%20of%20the,springs%2C%20or%20geothermally%20influenced%20depressions. Accessed 3 May 2023. [9] WTU Herbarium, Burke Museum. *Consortium of Pacific Northwest Herbaria*, www.pnwherbaria.org/data/results.php?DisplayAs=WebPage&ExcludeCultivated=Y&GroupBy=ungrouped&SortBy=Year&SortOrder=DESC&SearchAllHerbaria=Y&QueryCount=1&IncludeSynonyms1=Y&SciName1=Agrostis+variabilis. Accessed 2 May 2023.
Other Sources Consulted	[1] Duble, Richard L. “Bentgrass.” *Texas A&M Horticulture*, aggie-hort.tamu.edu/plantanswers/turf/publications/Bent.html. Accessed 3 May 2023. [2] Nordick, Brian. *Propagation of Bentgrass*, www.ndsu.edu/pubweb/chiwonlee/plsc368/student/papers04/briannordick/bentgrass.htm. Accessed 3 May 2023.
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