

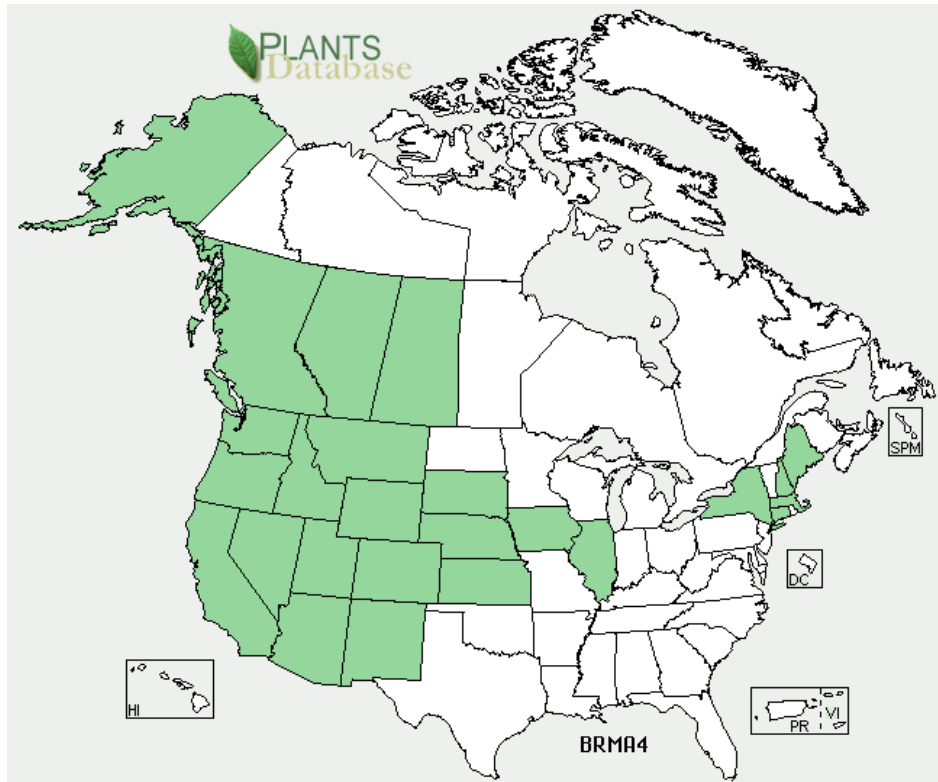
Plant Propagation Protocol for *Bromus marginatus* Nees ex. Steud
ESRM 412 – Native Plant Production



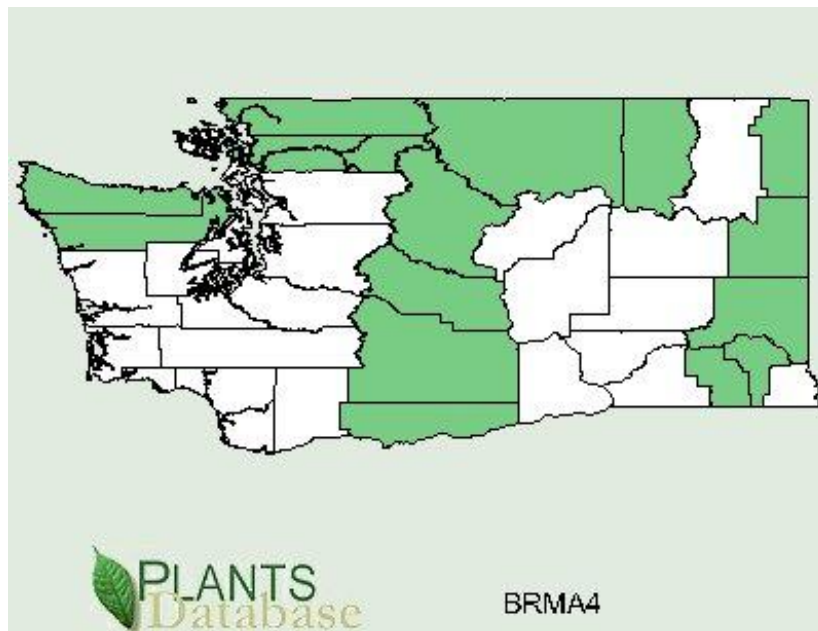
Photo By: Jeanne R. Janish 1997
Source: The New York Botanical Garden



Source: fs.fed.us



North America Distribution
Source: USDA Plants



Washington State Distribution
Source: USDA Plants

TAXONOMY

Family Names

Family Scientific Name:	Poaceae
Family Common Name:	Grass
Scientific Names	
Genus:	<i>Bromus</i>
Species:	<i>marginatus</i>
Species Authority:	Nees ex. Steud
Variety:	
Sub-species:	
Cultivar:	Bromar
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	<p><i>Bromus breviaristatus</i> Buckley</p> <p><i>Bromus carinatus</i> Hook. & Arn. Var. <i>linearis</i> Shear</p> <p><i>Bromus marginatus</i> Nees ex. Steud var. <i>breviaristatus</i> (Buckley) Beetle</p> <p><i>Bromus marginatus</i> Nees ex. Steud var. <i>laticus</i></p> <p><i>Bromus marginatus</i> Nees ex. Steud var. <i>seminudus</i> Shear</p> <p><i>Bromus sitchensis</i> Trin. var. <i>marginatus</i> (Nees ex. Steud) B. Bolvin</p> <p><i>Ceratochloa marginata</i> (Nees ex. Steud) B.D. Jackson</p> <p><i>Ceratochloa marginata</i> (Nees ex. Steud) W.A. Weber</p>
Common Name(s):	Mountain Brome, California Brome, Mountain grass Brome
Species Code (as per USDA Plants database):	BRMA4
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	See above for North American and Washington State distribution). Extends into British Columbia and Alberta to South Dakota, New Mexico, and California, mostly on the eastern slope; adventive in Maine, introduced in the mid-west.
Ecological distribution (ecosystems it occurs in, etc):	Dry to moist meadows, open woods, wooded slopes, waste places like highway right-of-ways, coal mine spills, heavy metal mine tailings (Tilley), and shrublands in the mountains. Likes yellow pine forest, red fir forest, lodepole forest, subalpine forest, alpine fell-fields, and valley grassland. (Quattocchi).

Climate and elevation range	Elevation between 5,000-10,500 feet
Local habitat and abundance; may include commonly associated species	Common in the mountains and foothills of the Intermountain West. (Tilley)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Adapted to coarse textured soils. Medium to high salinity tolerance. High moisture use but does not tolerate flooding. Useful for soil stabilization/erosion control. Good for a quick cover on disturbed sites (Tilley)
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Graminoid. Perennial bunchgrass, short-lived, tufted, erect, tall, more or less coarse, noncreeping, leafy, deep and well-branched root system, leaf sheaths sparsely to densely hairy, flower head mostly narrow and with erect branches. (Quattrocchi)
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Protocols prepared by David Skinner and Susan Winslow, updated to Native Plant Network site. Pullman area.
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:	
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):	Average annual production is 171 kg/ha. Tight root plug in container. Target size maximum 4 feet tall when mature.
Propagule Collection (how, when, etc):	Wildland collection begins early July to late August when the inflorescence begins to dry and the seed is in the soft to hard stage before it begins to shatter (natural dispersal) from the panicle. These are easily hand-harvested. One collection hour/person will yield about 318 grams clean seed. (Winslow)
Propagule Processing/Propagule	Seed processing will consist of spreading seed out onto

<p>Characteristics (including seed density (# per pound), seed longevity, etc):</p>	<p>a tarp in a dry, sheltered environment and turned daily for about 3-5 days until no moisture is present. Easily done by rubbing small amounts and cleaned. (Skinner). After drying, material is processed with a Winstersteiger plot combine at concave ¼ to ½ open, speed at 1,000 rpm and medium wind speed. Seed is then threshed using a hammermill through a 12/64 cm. round hole screen, and air-screen processed on a Eclipse cleaner over a 14/64 cm. round hole screen. Relatively easy to clean due to absence of excess fluff or other seed debris. Seeds/Kg come out to 139,000/kg. Germination comes out to about 75%. Purity comes out to 100%. (Winslow) They can be stored in controlled conditions at 40 degrees F and 40% relative humidity. (Skinner)</p>
<p>Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):</p>	<p>Seed germinates well without pretreatment, but could be treated with Carboxin or a similar compound to prevent smut. (Skinner) Seeds will be placed in 0-1 degree C for a 10 day cold stratification treatment and then exposed to 22-25 degree C temperatures. (Winslow)</p>
<p>Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):</p>	<p>Propagation environment will consist of a seedbed that is firm and free of weeds with good field moisture to 4 inches depth. (Winslow)</p>
<p>Establishment Phase (from seeding to germination):</p>	<p>Sow in spring or dormant fall. Sowing technique is to plant 25-30 pure live seed/ft. (0.3 m) row, with 91 cm., spacing, at a depth of 1.3 cm. Soil surface must be kept moist throughout the 2 week germination and emergence period. (Winslow)</p>
<p>Length of Establishment Phase:</p>	<p>2 weeks</p>
<p>Active Growth Phase (from germination until plants are no longer actively growing):</p>	<p>Plants are watered deeply every other day. (Skinner) In spring to fall is when broadleaf control with herbicides may occur prior to boot stage. Soil moisture is critical, milk stage of seed development. (Winslow)</p>
<p>Length of Active Growth Phase:</p>	<p>3 months</p>

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 cold frame in late March to early April depending on the weather conditions. Watered every other day if weather is cool, every day if it is hot. (Skinner)
Length of Hardening Phase:	2-4 weeks
Harvesting, Storage and Shipping (of seedlings):	For seed storage, place seeds in plastic seed bags and stored in a cool, dry environment. (Winslow)
Length of Storage (of seedlings, between nursery and outplanting):	Storage duration of 5-7 years. (Winslow)
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Transplanting would be done in early May using an electric drill and portable generator to drill 1.5 inch holes at the planting site. Transplanting into sites with existing vegetation reduces survival and vigor following planting. Flowering and some seed production occurs the year of transplanting, but takes another growing season before a significant amount is produced. (Skinner)
Other Comments (including collection restrictions or guidelines, if available):	
INFORMATION SOURCES	
References (full citations):	See Below
Other Sources Consulted (but that contained no pertinent information) (full citations):	
Protocol Author (First and last name):	Kelsey Gaynor Middleton
Date Protocol Created or Updated (MM/DD/YY):	5/18/11

References:

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