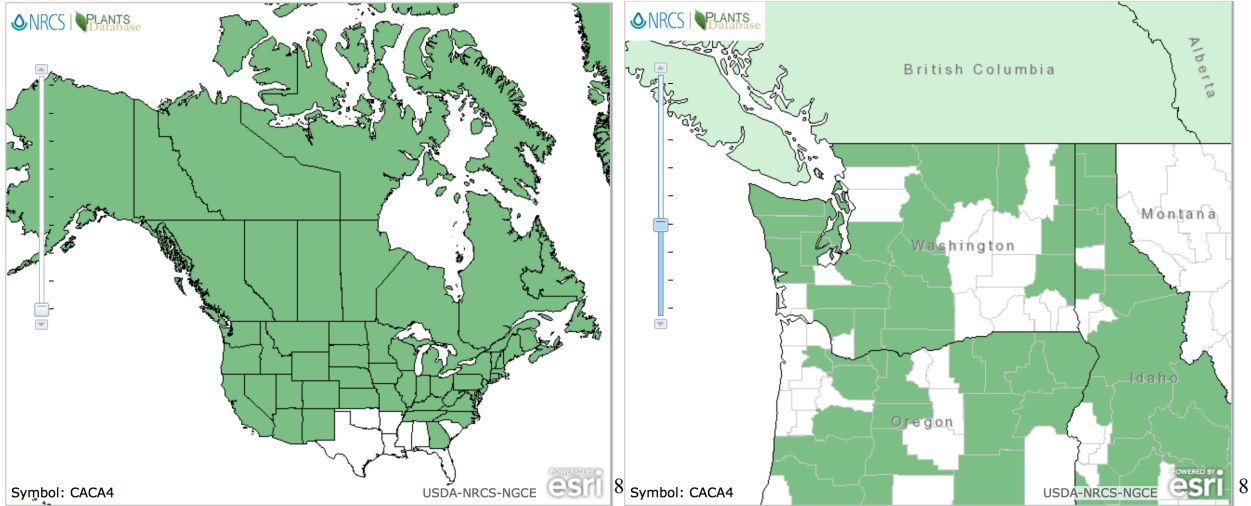


Plant Propagation Protocol for *Calamagrostis canadensis*

ESRM 412 – Native Plant Production Spring 2018

Protocol URL: <https://courses.washington.edu/esrm412/protocols/CACA4.pdf>



Source USDA Plant Database

TAXONOMY

Plant	
Family	
Scientific Name	Poaceae (Gramineae) ⁸
Common Name	Grass ⁸
Species	
Scientific Name	
Scientific Name	<i>Calamagrostis canadensis</i> (Michx.) P. Beauv ⁸
Varieties	<i>Calamagrostis canadensis</i> var. <i>macouniana</i> (Vasey) Stebbins ⁹ <i>Calamagrostis canadensis</i> var. <i>canadensis</i> (Michx.) Beauv. ⁹ <i>Calamagrostis canadensis</i> var. <i>robusta</i> Vasey ⁹ <i>Calamagrostis canadensis</i> var. <i>acuminata</i> Vasey ⁹ <i>Calamagrostis canadensis</i> var. <i>pallida</i> (Vasey & Scriber) Stebbins ⁹ <i>Calamagrostis canadensis</i> var. <i>typicana</i> (Stebbins) ⁹ <i>Calamagrostis canadensis</i> var. <i>imberbis</i> (Stebbins) C.Hitchc. ⁹ <i>Calamagrostis canadensis</i> var. <i>lactea</i> (W.J. Beal) C.Hitchc. ⁹ <i>Calamagrostis canadensis</i> var. <i>langsдорffii</i> (Link) Inman ⁹ <i>Calamagrostis canadensis</i> var. <i>scabra</i> (J.Presl) ⁹ <i>Calamagrostis canadensis</i> var. <i>arcta</i> Stebbins ⁹
Sub-species	<i>Calamagrostis canadensis</i> subsp. <i>langsdorffii</i> (Link) Hult. ⁹
Cultivar	

Common Synonym(s)	<i>Arundo canadensis</i> Michx.
Common Name(s)	Bluejoint, bluejoint reedgrass ⁷ , Canada reedgrass ⁵ , Canada bluejoint ² , meadow pinegrass, marsh reedgrass, marsh pinegrass ⁸
Species Code (as per USDA Plants database)	CACA4 ¹⁰
GENERAL INFORMATION	
Geographical range	<ul style="list-style-type: none"> • Circumboreal, less prevalent as one moves south⁶ • Present in all Canadian provinces, Alaska, and all continental US states except for 6 in the southeast⁴ Greenland, Eurasia⁶, Denmark¹⁰ • Often occurs on mountains, wetlands, open forests⁶ • Sea level to mid-mountain elevation⁶ <p>See maps at the top</p>
Ecological distribution	<ul style="list-style-type: none"> • Wetlands, wet prairies, open forest, tundra, lakeshores⁴
Climate and elevation range	<ul style="list-style-type: none"> • Climate: Boreal & temperate climates⁴ • Elevation: 5-1,100 meters⁴
Local habitat and abundance	<ul style="list-style-type: none"> • Ponds, ditches, roadsides, stream sides, pine forests, willow thickets, shallow standing water⁴ • Sandy and peat mediums⁴, with pH 3.5-8⁽⁸⁾ and medium nitrogen concentration⁶ <p>Often occurs with other wetland or mountain plants like:</p> <ul style="list-style-type: none"> • Wheatgrasses, sagebrush, bluestems, ponderosa shrubs etc.⁹ • Oaks, Spruce, Fir, Conifer, etc.⁹ • Depends on local plant community
Plant strategy type / successional stage	<p>Rhizomatous, perennial⁷ Competitive-Ruderal Slow but early colonizer⁸, understory dominant or co-dominant⁹ Spreads ~10cm year via rhizomes branching and forming a sod⁸ Seeds are volant and may be carried considerable distances by wind⁸ Late June-August blooms⁷</p>
Plant characteristics	<p>A dense, relatively tall grass⁸ 3-8 main stems⁸ (2-5ft tall) tipped with narrow, loosely branching panicles of a pale yellow-brown color¹ Rough, green blades, 3-8mm wide⁸</p>

	<p>Fibrous rhizomes run shallow in moist to wet medium³ Small seeds (pink-green coloration³) partially covered with fine hair⁸</p> <p>Seeds may remain dormant in the soil for up to 5 years⁸</p>
<p>PROPAGATION DETAILS: <i>Calamagrostis canadensis</i> – M. Van de Brooke (2018)</p>	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Bareroot
Stock Type	
Time to Grow	6-8 months
Target Specifications	<ul style="list-style-type: none"> • Health, height, breadth • Main culms 20-50cm by the first June after planting • <10cm diameter ground coverage and seeds present by second Autumn after planting
Propagule Collection Instructions	<ol style="list-style-type: none"> 1. Parent plants will be selected to maximize offspring health and diversity from the desired ecosystem type of intended propagation site 2. Seeds will be gathered in late August or early September by pinching a <i>C. Canadensis</i> seed-bearing stem over a paper bag and moving your hand up to strip off seeds. 3. Transport seed bag in cool-dry controlled receptacle to maintain dormancy 4. Separate seeds from chaff in double-screening process and maintain controlled conditions until planting season (late fall). Attempt to clean the seeds and reach seed count of 280,000 seeds/oz³.
Propagule Processing/Propagule Characteristics	<ol style="list-style-type: none"> 1. Separate seeds from chaff in double-screening process and maintain controlled conditions until planting season (late fall). Attempt to clean the seeds and reach seed count of 280,000 seeds/oz³. 2. Pack 0.04oz of seed material (about 1,000 seeds) into handfuls of peat moss.(Nursery- Planting section)
Pre-Planting Propagule Treatments	<ul style="list-style-type: none"> • Pack 0.04oz of seed material (about 1,000 seeds) into handfuls of peat moss. And maintain cool-dry environment to retain dormancy until planted
Growing Area Preparation / Annual Practices for	<ul style="list-style-type: none"> • Soil must be moist or wet, pH 3.5-8, full or partial sun availability • Clear lot of weeds or obstructions • Space plots ~3ft apart, and in various locations at a desired site • Dig fairly shallow holes (~7cm) and bury seed-peat moss mixture with dung or compost as fertilizer • Water and treat with KNO₃¹⁰ while seeds incubate to supplement rhizome

Perennial Crops	<p>growth</p> <ul style="list-style-type: none"> • Check in monthly to assure germination or possibly relocate seedlings
Establishment Phase Details	<ul style="list-style-type: none"> • Slow but early colonizer⁸, understory dominant or co-dominant⁹ • Spreads ~10cm year via rhizomes branching and forming a sod⁸ • Seeds are volant and may be carried considerable distances by wind⁸ • Late June-August blooms⁷
Length of Establishment Phase	<ul style="list-style-type: none"> • 3-5 annual growth cycles
Active Growth Phase	December-June
Hardening Phase	~1 year
Harvesting, Storage and Shipping	<ol style="list-style-type: none"> 1. Once seeds are harvest, they must remain in cool, dry conditions to prevent dormancy interruption or seed degradation 2. Seeds may last longer mixed in with peat moss, again to be kept in cool, dry conditions
Length of Storage	Seeds may remain dormant for up to 5 years ⁸
Guidelines for Outplanting / Performance on Typical Sites	<ul style="list-style-type: none"> • Healthy and diverse seeds from healthy, diverse parent plants according to desired propagation ecosystem • Health, height, spread • Main culms 20-50cm by first June • <10cm diameter ground coverage by second June • Once established, natural propagation will sustain a substantial propagation
Other Comments	<i>Calamagrostis canadensis</i> is a prevalent mountain and wetland plant spread all over the circumboreal northern hemisphere. The species as a whole is not endangered but particular subspecies or varieties may be. <i>C. canadensis</i> is useful for the restoration of an ecosystem. It is a quick colonizer that can secure wet soil with their rhizome networks.
INFORMATION SOURCES	
References	<ol style="list-style-type: none"> 1. "Bluejoint Grass (<i>Calamagrostis Canadensis</i>).” <i>Illinois Wildflowers</i>, www.illinoiswildflowers.info/grasses/plants/bluejoint.html. 2. "Calamagrostis Canadensis - (Michx.) Beauv.” <i>Nature Serve Explorer</i>, Nature Serve, http://explorer.natureserve.org/servlet/NatureServe?loadTemplate=tabular_report.wmt&paging=home&save=all&sourceTemplate=reviewMiddle.wmt 3. "Calamagrostis Canadensis - Blue Joint Grass.” <i>Prairie Moon Nursery</i>, Prairie Moon Nursery, www.prairiemoon.com/calamagrostis-canadensis-blue-joint-grass-prairie-moon-nursery.html. 4. "Calamagrostis Canadensis .” <i>The IUCN Red List of Threatened Species</i>,

	<p>International Union for Conservation of Nature and Natural Resources, www.iucnredlist.org/details/44393334/0.</p> <ol style="list-style-type: none"> 5. "Calamagrostis Canadensis (Michx.) Beauv." <i>Go Botany</i>, New England Wildflower Society, gobotany.newenglandwild.org/species/calamagrostis/canadensis/. 6. "Calamagrostis Canadensis (Michx.) P. Beauv." <i>E-Flora BC Atlas Page</i>, E-Flora BC: Electronic Atlas of the Flora of British Columbia, linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Calamagrostis canadensis. 7. "Calamagrostis Canadensis." <i>WTU Herbarium Image Collection</i>, Burke Museum, biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Carex&Species=lenticularis. 8. "Plants Profile for Calamagrostis Canadensis (Bluejoint)." <i>USDA Plants Database</i>, United States Department of Agriculture Natural Resources Conservation Service, plants.usda.gov/core/profile?symbol=CACA4. 9. Tesky, Julie L. 1992. <i>Calamagrostis canadensis</i>. In: <i>Fire Effects Information System</i>, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.fed.us/database/feis/plants/graminoid/calcan/all.html [2018, May 15]. 10. TWC Staff. "Calamagrostis Canadensis." <i>Lady Bird Johnson Wildflower Center Plant Database</i>, The University of Texas at Austin - Lady Bird Johnson Wildflower Center, 7 Dec. 2012, www.wildflower.org/plants/result.php?id_plant=caca4.
Other Sources Consulted	<ul style="list-style-type: none"> • Ramsay, Matthew. "Plant Data Sheet - Calamagrostis Canadensis." <i>Jobs Internships Opportunities</i>, University of Washington ESRM 412, 1 May 2003, depts.washington.edu/propplnt/Plants/Calamagrostis.htm.
Protocol Author	Michael Van de Brooke
Date Protocol Created or Updated	05-011-2018

PROPAGATION DETAILS:	
Information transplanted or adapted from Matthew Ramsay's 2003 ESRM 412 Plant Data Sheet - <i>Calamagrostis Canadensis</i>	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed, turf, rhizomes or containers
Product Type	Bareroot
Stock Type	
Target Specifications	Grows up to 120 cm, even 200 cm in 6 weeks
Propagule collection / Propagation recommendations	<p>Collection restrictions or guidelines: Flowers late June to mid July (Tesky, 1992) Strip seed from stalk (Butler and Frieswyk, 2001)</p> <p>From Noller (2001):</p>

	<p>Cleaned with air screen and debearder, no pre-treatments, sowed in field in spring, 2-3 cm deep, 50-70 seeds/30 cm on 1.5 meter rows</p> <p>From Butler and Frieswyk, (2001): Seeds striped from stalk by hand, sown in October and November, using 30 cm X 30 cm flat and Fafard superfine germinating mix, with 19°C day 13°C night air temperature, 21°C bottom heat, under a tent with 10 to 15 minute misters. One week after germination plants were moved out of tent, misting continued.</p>
Establishment Phase Details	See above
Length of Establishment Phase	Unspecified
Active Growth Phase	6 weeks
Hardening Phase	Unspecified
Harvesting, Storage and Shipping	Recommended seed storage conditions: Cool and dry (Noller, 2001)
Length of Storage	Seed life: Up to 5 years in soil (Tesky, 1992) More than 2 years kept cool and dry (Noller, 2001)
Guidelines for Outplanting / Performance on Typical Sites	Seed germination: 90% at 20°C for collected seed in Northwest territories (Tesky, 1992) 80% when direct seeded, field grown in western Colorado (Noller, 2001) "low" when grown in greenhouse in Estes Park Colorado, germinated in 11 to 14 days (Butler and Frieswyk, 2001)
Other Comments	Information transplanted from Matthew Ramsay's 2003 ESRM 412 Plant Data Sheet - <i>Calamagrostis Canadensis</i>

INFORMATION SOURCES

References	<ol style="list-style-type: none"> 1. Butler, Jennifer; Frieswyk, Christin. 2001. Propagation protocol for production of <i>Calamagrostis canadensis</i> seeds; Rocky Mountain National Park, Estes Park, Colorado. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 1 May 2003). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 2. Cooke, Sarah Spear. 1997 A Field Guide to the Common Wetland Plants of Western Washington &
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	<p>Northwestern Oregon. Seattle Audubon Society, Seattle, WA 415 p.</p> <ol style="list-style-type: none"> 3. Franklin, Jerry and C.T. Dyrness. 1988 Natural Vegetation of Oregon and Washington. Oregon State University Press, Corvallis, OR 452 p. 4. Noller, Gary L. 2001. Propagation protocol for production of <i>Calamagrostis canadensis</i> (Michx.) Beauv. plants; Meeker - Upper Colorado Environmental Plant Materials Center, Meeker, Colorado. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 1 May 2003). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. 5. Pojar, Jim and Andrew MacKinnon. 1994. Plants of the Pacific Northwest Coast Washington, Oregon British Columbia & Alaska. BC Ministry of Forests and Lone Pine Publishing, Vancouver, British Columbia, Canada 527 p. 6. Tesky, Julie L. 1992. <i>Calamagrostis canadensis</i>. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, April). Fire Effects Information System, Online. Available: http://www.fs.fed.us/database/feis/ Accessed 5/1/03.
Other Sources Consulted	
Protocol Author	Matthew Ramsay
Date Protocol Created or Updated	05-01-2003

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