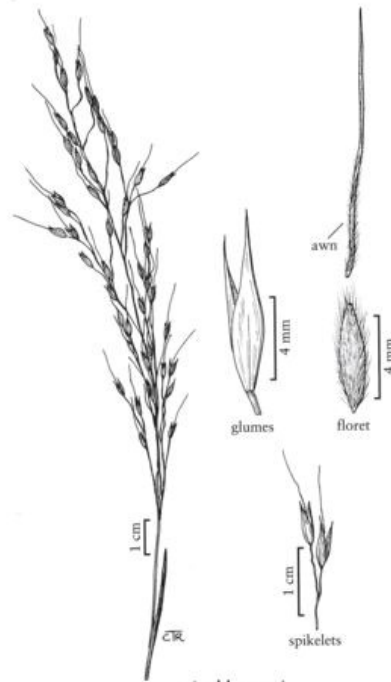


Plant Propagation Protocol for *Achnatherum x bloomeri*

ESRM 412 – Native Plant Production

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

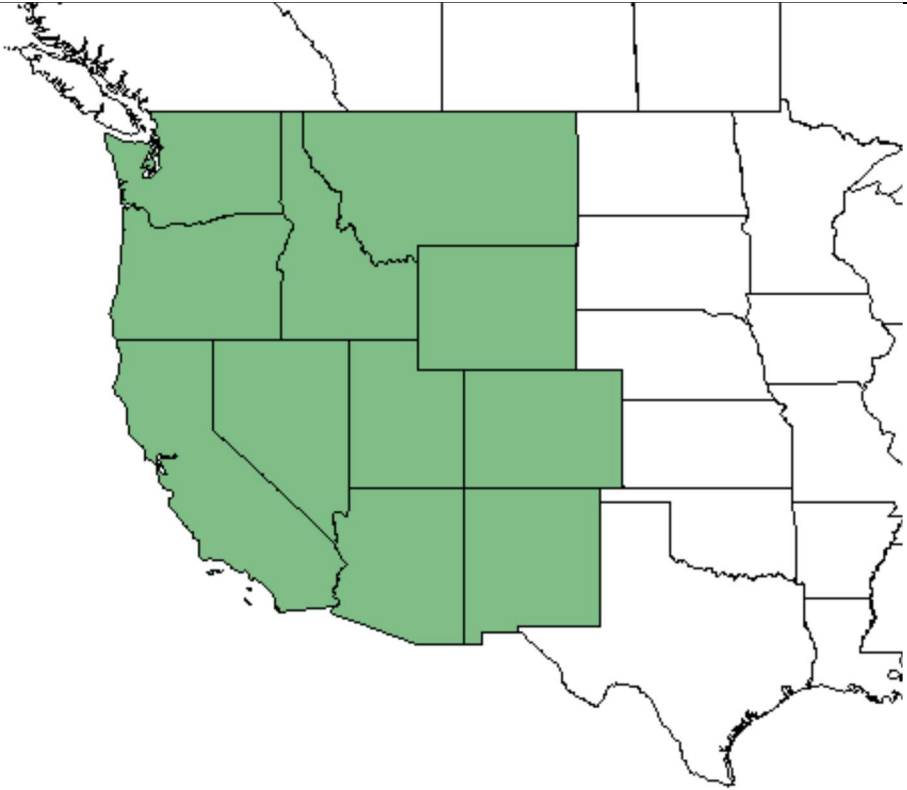


A. x bloomeri
ACHNATHERUM

(Barkworth, 2019).

TAXONOMY	
Plant Family	
Scientific Name	Poaceae (PLANTS).
Common Name	Grass Family (PLANTS).
Species Scientific Name	
Scientific Name	<i>Achnatherum x bloomeri</i> (Bol.) Barkworth [hymenoides x occidentale] (PLANTS).
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	<i>Oryzopsis bloomer</i> (Bol.) Ricker <i>Stippa bloomer</i> Bol. <i>Stiporyzopsis bloomer</i> (Bol.) B.L. Johnson (PLANTS).
Common Name(s)	Bloomer's Ricegrass (PLANTS).
Species Code (as per USDA Plants database)	ACBL (PLANTS).

GENERAL INFORMATION

Geographical range	 <p>(PLANTS). The plant can be found throughout the western US and all of Washington</p>
Ecological distribution	Open meadows, often dry for most of the year (Barkworth, 2019).
Climate and elevation range	Unknown
Local habitat and abundance	Uncommon (Barkworth, 2019).
Plant strategy type / successional stage	<i>Achnatherum xbloomeri</i> is a hybrid between <i>Achnatherum hymenoides</i> (Indian ricegrass) and <i>Achnatherum occidentale</i> (Western Needlegrass) (PLANTS). It only occurs after the parent species have been established in the same area.
Plant characteristics	The result of this hybrid is a sterile grass with longer florets and lemma hairs. They produce a large amount of deformed pollen and does not form good caryopses to capture pollen from other plants (Barkworth, 2019).

PROPAGATION DETAILS - *A. hymenoides* seed

Ecotype	BLM land, Oregon (Barner, hym 2009). Colorado (Foxx, 2015).
Propagation Goal	Seed (Barner, 2009), (Foxx, 2015).
Propagation Method	Seed (Barner, 2009), (Foxx, 2015).
Product Type	Container (plug) (Foxx, 2015).
Stock Type	N/A
Time to Grow	Weeks (Foxx, 2015).
Target Specifications	N/A

Propagule Collection Instructions	Small lot collection by hand (Barner, hym 2009).
Propagule Processing/Propagule Characteristics	Seeds processed with laboratory brush machine to remove seeds from stem and awns is screened to remove debris. Then the seeds are air screened with a top and bottom screen in high air. 92,570 seeds per pound, 99% purity (Barner, hym 2009).
Pre-Planting Propagule Treatments	Dormancy that mimics winter/spring conditions seem to germinate best. This means to be held at 35 degrees F for 12 weeks then 52/34 degrees for 4 additional weeks (Foxx, 2015).
Growing Area Preparation / Annual Practices for Perennial Crops	Not specified, assumed seeding media (Foxx, 2015).
Establishment Phase Details	Very low germination rates resulted in little establishment data. Those that germinated at a rate of 5-7% while the others germinated at 0% (Foxx, 2015).
Length of Establishment Phase	Very low germination rates resulted in little establishment data. Assumed establishment phase 16 weeks (Foxx, 2015).
Active Growth Phase	Very low germination rates resulted in little active growth data (Foxx, 2015).
Length of Active Growth Phase	Very low germination rates resulted in little active growth data (Foxx, 2015).
Hardening Phase	Very low germination rates resulted in little hardening data (Foxx, 2015).
Length of Hardening Phase	Very low germination rates resulted in little hardening data (Foxx, 2015).
Harvesting, Storage and Shipping	Seeds can be stored at 33-38 degrees F (Barner, hym 2009).
Length of Storage	Very low germination rates resulted in little seedling data (Foxx, 2015).
Guidelines for Outplanting / Performance on Typical Sites	Very low germination rates resulted in little outplanting data (Foxx, 2015).
Other Comments	It may be very difficult to propagate <i>A. xbloomeri</i> if <i>A. hymenoides</i> cannot be propagated.
PROPAGATION DETAILS - <i>A. occidentale</i> seed	
Ecotype	Klamath Falls, OR (Barner, occ 2009). Crater Lake, OR (Flessner & Trindle, 2003).
Propagation Goal	Seeds (Barner, occ 2009).
Propagation Method	Plants (Flessner & Trindle, 2003).
Product Type	Plugs (Flessner & Trindle, 2003).
Stock Type	10 (Flessner & Trindle, 2003).
Time to Grow	10 months (Flessner & Trindle, 2003).
Target Specifications	Roots fill container and crown is healthy (Flessner & Trindle, 2003).
Propagule Collection Instructions	Assumed collection by hand (Barner, 2008). Hand strip seed heads (Flessner & Trindle, 2003).
Propagule Processing/Propagule Characteristics	Seeds cleaned using brushing machine then air-screened using top and bottom screen in high air. 228,910 seeds per pound, 99% purity (Barner, occ 2009).
Pre-Planting Propagule Treatments	20 weeks of stratification to mimic wintertime required for 91% germination (Flessner & Trindle, 2003).

Growing Area Preparation / Annual Practices for Perennial Crops	Sown into 10" cone-tainers with potting media. Containers well watered and kept at 32-35°C for 20 weeks. Checked regularly for dryness and watered as needed (Flessner & Trindle, 2003).
Establishment Phase Details	N/A
Length of Establishment Phase	4 weeks (Flessner & Trindle, 2003).
Active Growth Phase	Established plants fertilized every two weeks. Top growth trimmed in late June to encourage lateral growth (Flessner & Trindle, 2003).
Length of Active Growth Phase	April – July (Flessner & Trindle, 2003).
Hardening Phase	Fertilizer was discontinued after June and the plants were watered less in August (Flessner & Trindle, 2003).
Length of Hardening Phase	4 weeks (Flessner & Trindle, 2003).
Harvesting, Storage and Shipping	Seeds stored at 33-38 degrees F (Barner, occ 2009).
Length of Storage	Seeds can be stored for many years (Flessner & Trindle, 2003).
Guidelines for Outplanting / Performance on Typical Sites	Ready to be outplanted after a few weeks of leaving nursery (Flessner & Trindle, 2003).
Other Comments	Based on success of <i>A. occidentale</i> , <i>A. xbloomeri</i> may be possible.
PROPAGATION DETAILS - <i>A. xbloomeri</i> seed	
Ecotype	Western US (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Propagation Goal	Plants (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Propagation Method	Seed (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Product Type	Container (plug) (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Stock Type	Unknown
Time to Grow	Assumed weeks – months (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Target Specifications	Unknown
Propagule Collection Instructions	Collected from parent by hand (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Propagule Processing/Propagule Characteristics	Assumed brushed and air-screened with top and bottom screen on medium air (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Pre-Planting Propagule Treatments	Assumed winter stratification (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Growing Area Preparation / Annual Practices for Perennial Crops	Unknown
Establishment Phase Details	Unknown

Length of Establishment Phase	Unknown
Active Growth Phase	Assumed summertime (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Length of Active Growth Phase	Unknown
Hardening Phase	Assumed reduced water in Fall (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Length of Hardening Phase	Assumed autumn (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Harvesting, Storage and Shipping	Assumed seeds can be stored at low temps of 35 degrees F (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Length of Storage	Assumed seeds can be stored for several years (Barner, occ 2009), (Barner, hym 2009), (Flessner & Trindle, 2003).
Guidelines for Outplanting / Performance on Typical Sites	Unknown
Other Comments	Much of this information is inferred from the propagation of the parent species. More information is required to understand proper propagation protocol for <i>Achnatherum x bloomeri</i> .

INFORMATION SOURCES

References	<p>Barkworth, Mary E. (2019). <i>Achnatherum xbloomeri</i>. Flora of North America. Accessed 24 May 2020. http://beta.floranorthamerica.org/Achnatherum_%C3%97bloomeri</p> <p>Barner, Jim. (2009). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Achnatherum hymenoides</i> (Roem. & Schult.) Barkworth seeds USDA FS - R6 Bend See http://NativePlantNetwork.org US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>Barner, Jim. (2009). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Achnatherum occidentale</i> (Thurb.) Barkworth seeds USDA FS - R6 Bend See http://NativePlantNetwork.org US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>Barner, Jim. (2008). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Achnatherum occidentale</i> (Thurb.) Barkworth seeds USDA FS - R6 Bend See http://NativePlantNetwork.org US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>Foxx, Alicia; Kramer, Andrea T. (2015). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Achnatherum hymenoides</i> (Roem. & Schult.) Barkworth seeds USDA FS - R6 Bend See http://NativePlantNetwork.org US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>"PLANTS Profile for <i>Achnatherum xbloomeri</i>" USDA Plants. 20 May. 2020 < https://plants.sc.egov.usda.gov/core/profile?symbol=ACBL >.</p> <p>Flessner, Theresa R; Trindle, Joan D.C.. (2003). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Achnatherum occidentale</i> (Thurb. ex S. Wats.) Barkworth plants 10; USDA National Plant Materials Center Corvallis, Oregon. In: Native Plant Network. Accessed 24 May 2020. http://NativePlantNetwork.org</p>
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	http://NativePlantNetwork.org . US Department of Agriculture, Forest Service, Reforestation, Nurseries, and Genetic Resources.
Other Sources Consulted	ITIS Taxonomy Report. <i>Achnatherum X bloomeri</i> . Taxonomic Serial No. 507933. Ac < https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_ "PLANTS Profile for <i>Achnatherum hymenoides</i> " USDA Plants. 20 May. 2020 < https://plants.sc.egov.usda.gov/core/profile?symbol=ACHY >. "PLANTS Profile for <i>Achnatherum occidentale</i> " USDA Plants. 20 May. 2020 < https://plants.sc.egov.usda.gov/core/profile?symbol=ACOC3 >.
Protocol Author	Indigo Doll
Date Protocol Created or Updated	05/27/20