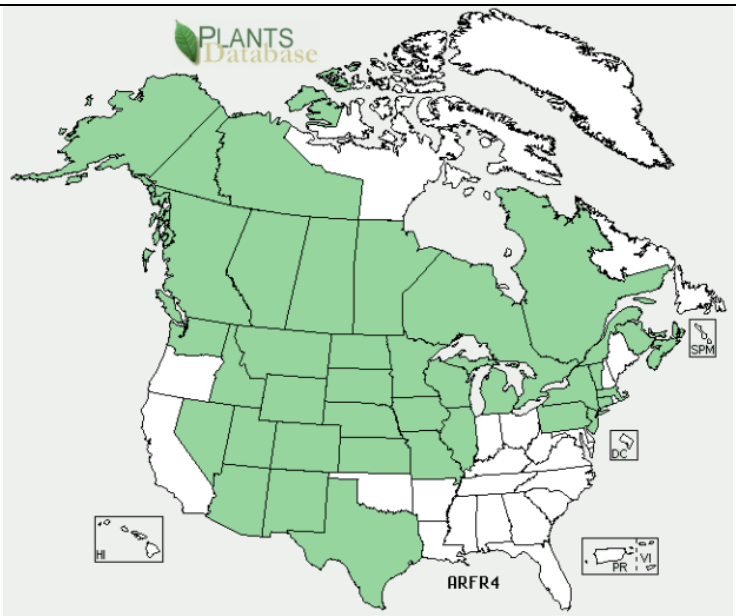
Plant Propagation Protocol for *Artemisia frigida*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*ARFR4.pdf*

https://www.pfaf.org/USER/Plant.aspx?LatinName=Artemisia+frigida

TAXONOMY	
Plant Family	
Scientific Name	Asteraceae/Compositae (6)
Common Name	Aster or Sunflower family (5)
Species Scientific Name	
Scientific Name	*Artemisia frigida* Willd (6)
Varieties	*Artemisia frigida* Willd. var. *frigida* *Artemisia frigida* var. *gmelinianum* Besser *Artemisia frigida* var. *williamsae* S.L.Welsh. (3)
Sub-species	N/A
Cultivar	N/A

Common Synonym(s)	*Artemisia virgata* Richardson (3)
Common Name(s)	Prairie sagewort, pasture sage, prairie sagebrush, fringed sage, fringed sagebrush, sagebrush, sweet sage, sagewort, pasture sage, and northern wormwood. (5,8)
Species Code (as per USDA Plants database)	ARFR4 (6)
GENERAL INFORMATION	
Geographical range	 https://plants.usda.gov/factsheet/pdf/fs_arfr4.pdf  https://plants.usda.gov/core/profile?symbol=arfr4
Ecological distribution	*Artemisia frigida* is found in open high plains, prairies, and semi-disturbed sites. It can be found in dry grasslands, rocky slopes, sandy cutbanks, and gravelly terraces and ridges. (7,8)

Climate and elevation range	This species is typically found in dry climates. It can be found in montane and subalpine zones. Typically occurs from 1,200 to 3,350 m. (4,7)
Local habitat and abundance	Most commonly found in dry, open plains, and foothills. It is typically abundant in its natural habitat. Known to associate with many grasses and forbs, including, *Artemisia tridentata*, *Artemisia bigelovii*, *Artemisia filifolia*, *Ceratoides lanata*, and *Gutierrezia sarothrae*. It is also common in ponderosa pine communities. (2,3,8)
Plant strategy type / successional stage	*Artemisia frigida* is drought tolerant and has a "fair" salt tolerance. It also does well in all successional stages, and is an especially good pioneer species to stabilize soil after a disturbance. This plant can displace desirable vegetation in unmanaged rangeland. (3,4,5)
Plant characteristics	This species is a spreading subshrub that grows between 4 and 16 inches tall (approximately 0.1-0.4 m). It has flowering stalks and is covered in silvery hairs. The leaves are small and clustered at the base and along the stem. They are 3 to 5 times divided and approximately 5-12 mm in length. The inflorescences are a narrow panicle and the flowers are between 2 to 3 mm. It blooms from July to August and is especially fragrant. (2,5)
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	N/A
Time to Grow	N/A
Target Specifications	Root development. (8)
Propagule Collection Instructions	Seeds can be hand stripped from inflorescences. (9)
Propagule Processing/Propagule Characteristics	Over 4 million seeds per pound. (9)
Pre-Planting Propagule Treatments	Hand cleaning with a rub board and hand screens. The screened material can be placed in a seed blower to remove fine materials. Seeds exposed to light can germinate more quickly than seeds kept in the dark. Germination rates and amounts can also be increased if moist stratification of fresh seeds occurs for 10 days at 39.2°F. (9)
Growing Area Preparation / Annual Practices for Perennial Crops	Plant when soil temperatures are below 50° F and keep in a greenhouse while they are growing. Seeds should be sown at a depth of four times the diameter of the seed. (9)
Establishment Phase Details	1-2 weeks. Germination rate is approximately 50% in the first 5-

	12 days. (1,9)
Length of Establishment Phase	N/A
Active Growth Phase	N/A
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	N/A
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	
Time to Grow	N/A
Target Specifications	N/A
Propagule Collection Instructions	Plants should be separated in late fall or winter. When dividing the whole plant, it should be removed gently from the soil using a pitchfork, while using care not to damage the roots. As much soil should be removed from the roots as possible. The stems should be divided into smaller sections with new buds on each. Only use healthy sections of the plant. Replanting should occur right away. (8)
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	As much soil from the roots of the mother plant should be removed as possible. (8)
Growing Area Preparation / Annual Practices for Perennial Crops	Allow enough room for the roots to spread out when replanting. Plant in full sun and have 12-18 inch centers. Use a light, loose soil. (8)
Establishment Phase Details	N/A
Length of Establishment Phase	N/A
Active Growth Phase	N/A
Length of Active Growth Phase	N/A

Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	Divided plants should be replanted as quickly as possible. If the plants cannot be replanted within a couple of hours they should be dipped in water and then kept in an airtight plastic bag in a cool, shady area. (8)
Guidelines for Outplanting / Performance on Typical Sites	Replant the sections at the same depth as the mother plant. Cut back old top-growth. (8)
Other Comments	N/A
INFORMATION SOURCES	
References	*(1) Artemisia frigida* – Willd. Plants for a Future. https://www.pfaf.org/USER/Plant.aspx?LatinName=Artemisia+frigida (2) Giblin, D and Knoke, D. *Artemisia frigida*. Burke Museum. University of Washington. http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Artemisia&Species=frigida (3) McArthur, E and Taylor, J. *Artemisia frigida* Willd. USDA, Forest Service. https://www.fs.fed.us/rm/boise/research/shrub/Links/2004papers/mcarthur-artemisiafrigida2004.pdf (4) McWilliams, J. 2003. *Artemisia frigida*. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/shrub/artfri/all.html (5) Parr, S and Taliga, C. 2012. Plant Fact Sheet for Prairie Sage (*Artemisia frigida*). USDA, Natural Resources Conservation Service, Denver State Office. Denver, Colorado. https://plants.usda.gov/factsheet/pdf/fs_arfr4.pdf (6) Plant Profile for *Artemisia frigida*. USDA, Natural Resources Conservation Service. https://plants.usda.gov/core/profile?symbol=arfr4 (7) Pojar, J and MacKinnon, A. 2013. Alpine Plants of the Northwest. Lone Pine Publishing. Vancouver, BC.

	(8) Stevens, M. 2000. Plant Guide for Prairie Sagewort (*Artemisia frigida*). USDA-Natural Resources Conservation Service. https://plants.usda.gov/plantguide/pdf/cs_arfr4.pdf (9) Wynia, R. 2002. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) *Artemisia frigida* seeds USDA NRCS - Manhattan Plant Materials Center Manhattan, Kansas. https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=asteraceae-artemisia-1334&referer=wildflower
Other Sources Consulted	*(1) Artemisia frigida.* 2009 Feb 19. Lady Bird Johnson Wildflower Center. The University of Texas at Austin. https://www.wildflower.org/plants/result.php?id_plant=arfr4
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