Protocol Information

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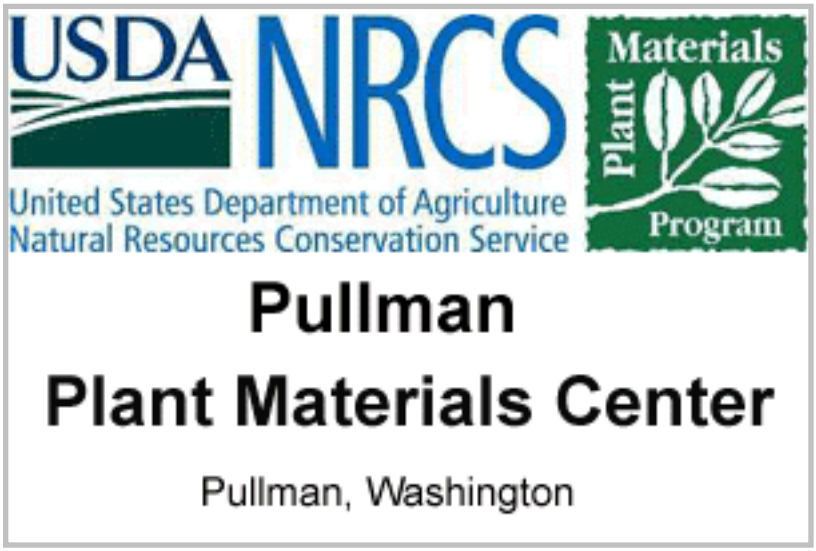

Family Scientific Name:	**Rosaceae**
Family Common Name:	**Rose**
Scientific Name:	***Sanguisorba occidentalis* Nutt.**
Common Name:	**Western burnet**
Species Code:	**SAOC2**
Ecotype:	**south of Moscow, ID**
General Distribution:	**Dry, open, rocky places that are vernally moist from British Columbia to California and east to Nevada and Idaho.**
Known Invasiveness:	**While it is sometimes considered "semi-weedy", it is not invasive.**
Propagation Goal:	**Plants**
Propagation Method:	**Seed**
Product Type:	**Container (plug)**
Stock Type:	**10 cu. in.**
Time To Grow:	**4 Years**
Target Specifications:	**Tight root plug in container.**

Propagule Collection:	**Fruit is an achene enclosed in the dried hypanthium. Seed is collected in early July when the inflorescence is dry and the seeds are grayish-brown in color. Seed can be stripped from the inflorescence or the inflorescence can be clipped from the plant. Seed maturity is fairly uniform. Harvested seed is stored in paper bags at room temperature until cleaned.**
Propagule Processing:	**The inflorescence is rubbed by hand to free the seed, then cleaned with an air column separator. Larger amounts can probably be threshed with a hammermill, then cleaned with air screen equipment. Clean seed is stored in controlled conditions at 40 degrees Fahrenheit and 40% relative humidity.**
Pre-Planting Treatments:	**Extended cold, moist stratification is needed for this ecotype.** **Chirco & Turnoer (1986) indicate germination will occur in light or dark without pretreatment. Alaskan ecotypes of *S. officinalis, S. menziesii,* and *S. canadensis* germinate rapidly w/o pretreatment (Holloway & Matheke 2003), as does the introduced *S. minor* (Young & Young 1986).** **However, unpublished data from trials conducted at the Pullman Plant Materials Center revealed that no emergence occurred without stratification. 45 days of cold, moist stratification resulted in 10% emergence. 90 days of cold,**

	moist stratification resulted in 33% emergence. Containers sown in November and left outside under cool, fluctuating spring temperatures achieved 97% emergence. Seedlings which germinated in the greenhouse thrived in the constant warmth, so it is likely the longer stratification time and not the cool, fluctuating temperature was the factor in the increased germination. Seeds were covered in all trials. The effects of light on germination were not explored.
Growing Area Preparation/ Annual Practices for Perennial Crops:	**In October seed is sown in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. A thin layer of coarse grit is applied to the top of the planting soil to prevent seeds from floating during watering. Conetainers are watered deeply and placed outside. Conetainers are moved to the greenhouse in February. Alternately, seed can be moist stratified in a refrigerator at 35-40 degrees F for 120 days before sowing in the greenhouse.**
Establishment Phase:	**Medium is kept moist until germination occurs. Germination usually begins in 4 days and is complete in 8 days.**
Length of Establishment Phase:	**1 week**

Active Growth Phase:	**Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients. Plants may require water every day during the final part of the active growth period.**
Length of Active Growth Phase:	**2-3 months**
Hardening Phase:	**Plants are moved to the cold frame in early to mid April, depending on weather conditions and plant performance. They are watered every other day if the weather is cool, and every day during hot, dry spells.**
Length of Hardening Phase:	**2-4 weeks**
Outplanting performance on typical sites:	**Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site. Survival in seed increase plantings without competing vegetation averages 95%. Transplanting into sites with existing vegetation may reduce survival and vigor depending on weather conditions following planting.**
Other Comments:	***S. occidentalis*** **is a biennial to short-lived perennial. It is very similar to the more easterly *S. annua* except *S. annua* has mostly 4 stamens rather than 2, and a much more prominently winged calyx in fruit (Hitchcock et al 1969). *S. occidentalis* is sometimes considered a synonym of *S. annua*.**

References: **Chirco, Ellen, and Terry Turnoer. 1986. Species without AOSA Testing Procedures. The Newsletter of the Association of Official Seed Analysts 60 (2):2-66. Available online at http://www.aosaseed.com/Species%20wo%20AOSA%20list%20plus%20adds.pdf Updated November 11/10/03.**

Hitchcock, C. Leo, Arthur Cronquist, Marion Ownbey, and J.W. Thompson. 1969. Vascular Plants of the Pacific Northwest. Volume 3, Saxifragaceae to Ericaceae. University of Washington Press. Seattle, WA. 5 vols.

Hitchcock, C. Leo, and Arthur Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press. Seattle, WA. 730 pp.

Holloway, Patricia S. and Grant E.M. Matheke. 2003. Seed Germination of Burnet, *Sanguisorba* spp. Native Plants Journal 4(2):95-99.

Larrison, Earl J., Grace W. Patrick, William H. Baker, and James A. Yaich. 1974. Washington Wildflowers. The Seattle Audubon Society. Seattle, WA. 376 pp.

Rickett, Harold W. 1973. Wildflowers of the United States: The Central Mountains and Plains. Vol. 6. (3 parts). McGraw Hill, New York.

St. John, Harold. 1963. Flora of Southeastern Washington and of Adjacent Idaho. 3rd edition. Outdoor Pictures. Escondido, CA. 583 pp.

USDA NRCS. 2007. The PLANTS Database (http://plants.usda.gov, 6 March 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Young, James A. and Cheryl G. Young. 1986. Collecting, Processing and Germinating Seeds of Wildland Plants. Timber Press. Portland, OR. 236 pp.

Citation:

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