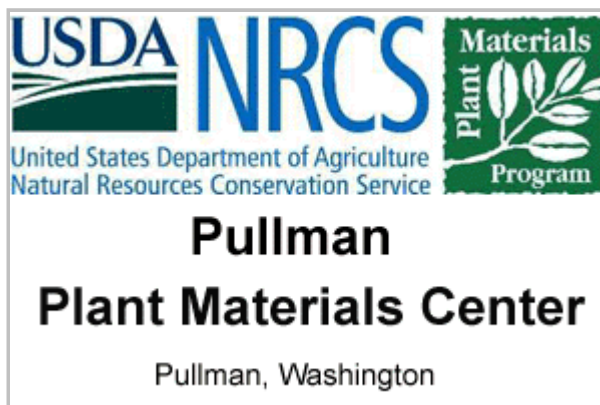


# Protocol Information

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Family Scientific Name: **Rosaceae**  
 Family Common Name: **Rose**  
 Scientific Name: ***Geum triflorum* Pursh var. *ciliatum* (Pursh) Fassett**  
 Common Synonym: ***Sieversia ciliata* (Pursh) G. Don ' '**  
 Common Name: **Prairie smoke, Old man's whiskers**  
 Species Code: **GETRC2**  
 Ecotype: **Paradise Creek drainage near Pullman, WA.**  
 General Distribution: **The species is widespread across Canada and the western and northern US. Mean annual precipitation range is from 16-40 inches (USDA NRCS 2007). The local phase, var. *ciliatum*, is restricted to western North America from British Columbia south to California and east to Montana and New Mexico. It may also be found on moister sites in areas receiving less than 16 inches of precipitation. In eastern Washington it is found in open areas from sagebrush steppe to grasslands and open Ponderosa pine forests and in subalpine meadows.**  
 Propagation Goal: **Plants**  
 Propagation Method: **Seed**  
 Product Type: **Container (plug)**  
 Stock Type: **10 cu. in.**  
 Time To Grow: **4 Months**  
 Target Specifications: **Tight root plug in container.**  
 Propagule Collection: **Fruit is an achene. It ripens in late June**

and July. It is collected by hand when the seed is grey-brown in color and separates easily from the inflorescence. Seed is wind disseminated, but will hold on the plant for several days after maturity. Seed maturity is indeterminant, collection can occur over a period of several weeks. Harvested seed is stored in paper bags at room temperature until cleaned.

Propagule Processing: The style elongates to form a plume on the achene to aid in wind dissemination. The style is difficult to remove by hand. Small amounts are rubbed to free the seed, then cleaned with an air column separator. Because of the difficulties in removing the style, seed purity is reduced in hand cleaned samples. Larger amounts are threshed with a hammermill. Sterile rice hulls are added to the hammermill to facilitate removal of the style. Seed is then cleaned with air screen equipment. This results in a much cleaner product than hand cleaning. There is a much variability in seed size, which still impedes cleaning. Most seed lots are estimated to be 85-90% pure. Clean seed is stored in controlled conditions at 40 degrees Fahrenheit.

696,000 seeds/lb for the species (Hassell et al 1996).

We determined 449,554 seeds/lb for this ecotype of var. *ciliatum*.

Pre-Planting Treatments: Some authors report that seed germinates well without pretreatment (Link 1993, Young & Young 1986). Young and Young also report that seed will germinate over a period of 1 month. Seed from a South Dakota source showed no response to stratification and germination was high for untreated seed (Sorenson & Holden 1974). McDonough (1969) germinated seed from a subalpine Utah source at alternating day/night temperatures of 25/15 °C. Best growth from those seeds was obtained in a greenhouse with day/night temperatures of at least 20/10°C. In another study, he found that the highest germination was at alternating day/night temperatures of 17/12°C (McDonough 1970). For seed

from a Wisconsin source, 3 months of cold moist stratification resulted in 64% germination, while untreated seed germinated at 50% (Green & Curtis 1950). Alpine seed of *G. triflorum* var. *campanulatum* from Olympic National Park in Washington germinated better after a nine month after-ripening period (Kaye 1997). For seed from a northern Idaho source, Nauman (2002) found that 120 days of cold moist stratification with light resulted in the highest germination and that seed germinates at low temperatures during stratification.

For this ecotype, germination without pretreatment is high. Trials conducted at the PMC comparing untreated seed with cold, moist stratified seed showed no benefit from stratification. The seed stratified outdoors emerged more quickly (2-3 days) when moved to the greenhouse and reached maximum emergence sooner (6-8 days). This is probably due to the ability of the seed to begin the germination process at low temperatures.

Growing Area Preparation/  
Annual Practices for Perennial Crops:

**In January seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in conetainers to allow deep watering. 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.**

Establishment Phase: **Medium is kept moist until germination occurs. Germination usually begins in 10 days and is complete in 30-35 days.**

Length of Establishment Phase: **1 month**

Active Growth Phase: **Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients.**

Length of Active Growth Phase: **3 months**

Hardening Phase: **Plants are moved to the cold frame in late March or early April, depending on weather conditions. 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**

Harvesting, Storage and Shipping:

Length of Storage:

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 exceeds 95%. Transplanting into sites with existing vegetation reduces survival and vigor depending on weather conditions following planting. Flowering and seed production usually occurs 2 years after transplanting.**

Other Comments: **No insect problems have been noted. *Geum ciliatum* is also synonymous. There are several other varieties of *Geum triflorum* widespread in western and northeastern North America.**

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