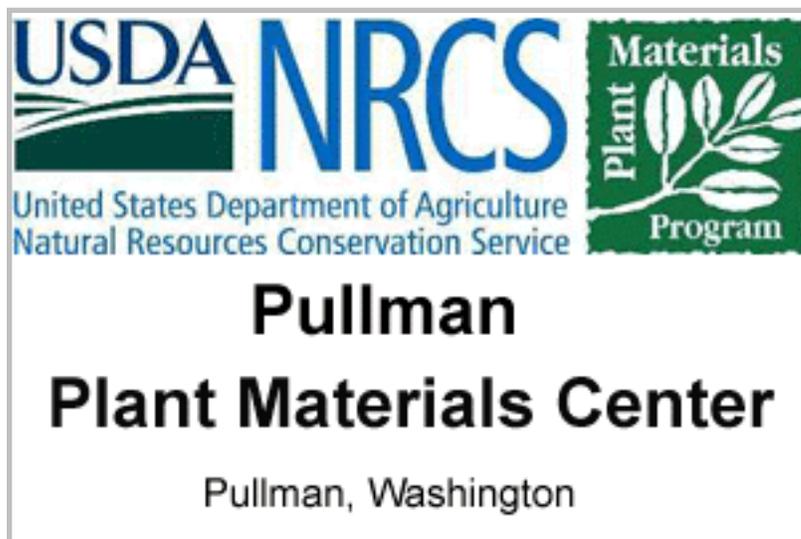


Protocol Information

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Family Scientific Name: **Scrophulariaceae**

Family Common Name: **Figwort**

Scientific Name: ***Penstemon attenuatus* Dougl.
ex Lindl.**

Common Name: **Taper-leaf penstemon, sulfur
penstemon**

Species Code: **PEAT3**

Ecotype: **Palouse region south of
Moscow, ID**

General Distribution: **Native to grasslands and open
forests of eastern Washington,
northeast Oregon, northern
and central Idaho, and western
Montana. The Palouse phase is
var. *attenuatus*.
Wetland indicator status is
FACU (US Fish and Wildlife
Service 1988).**

Known Invasiveness: **not invasive**

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 a capsule. Seed is dark brown in color. Seed is collected when the capsules begin to split in late July and is stored in paper bags or envelopes at room temperature until cleaned. Plants hold their seed well after the capsules begin to split if winds are not excessive.**

Propagule Processing: **Small amounts are rubbed to free the seed, then cleaned with an air column separator. Larger amounts are 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: **For this ecotype, 90 or more days of cold moist stratification is required. Unpublished data from trials conducted at the Pullman Plant Materials Center revealed that no emergence occurred without stratification. 45 days of cold, moist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 72% emergence. Containers sown in November and left outside under cool, fluctuating spring temperatures achieved 95% 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. Surface sown seed in all treatments germinated at lower rates than covered seed. This, at least in part, may be due to desiccation from fluctuating moisture levels. Seed exposed to light might well germinate at higher levels under more favorable moisture conditions but the high germination and emergence from covered seed under extended cold, moist stratification indicates light is not a factor in germination of this ecotype.

Seed of some penstemon species loses dormancy after 2½ years (Allen et al 1990).

Growing Area Preparation/
Annual Practices for Perennial Crops:

In October or November 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 January. Alternately, seed can be moist stratified in a refrigerator at 35-40 degrees F for 90+ 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 7 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: **3-4 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**

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 may reduce survival and vigor depending on weather conditions following planting. Plants will flower the year following outplanting.**

Other Comments: **No insect or disease problems have been noted. Both yellow flowered and purplish flowered plants are found on the Palouse. The yellow flowered phase is sometimes called sulfur penstemon.**

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