



Propagule Collection:

Propagule Processing: **After threshing, a hammermill or debearder must be used to further thresh the seed and break up stems to allow easier feeding through cleaning equipment. Processing seed with a hammermill or a debearder will facilitate seed flow in cleaning equipment. Seed is cleaned with air screen equipment. Removing the awns is necessary to assure even and accurate flow through most seed drills. Clean seed is stored in controlled conditions at 40 degrees Fahrenheit and 40% relative humidity.**

Pre-Planting Treatments: **For dryland seedings which receive less than 16 inches mean annual precipitation, fall dormant seedings are preferred. Dryland plantings made in areas receiving 18 or more inches of annual precipitation should be sown in the spring. In areas receiving 16-18 inches of precipitation, either spring or fall seedings can be made. Irrigated seedings may be made at any time. Bluebunch wheatgrass will germinate under a wide variety of soil temperatures (Young, Eckert & Evans. 1981).**

Growing Area Preparation/  
Annual Practices for Perennial Crops:

**In April or early May, seed is sown in 36 inch wide rows at a rate of 30-40 seeds/linear foot. Even with the awns removed, Secar does not flow well through most seed drills. Constant agitation must be provided to assure even seed distribution. Seedings should be made in a firm, weed-free seedbed. A firm seed bed holds moisture near the surface of the soil and assures accurate seed placement. This can be accomplished by no-till seeding techniques or by conventional tillage followed by a roller or packer.**

**Seed is sown as early in the spring as possible. Early seedings are more likely to be affected by soil crusting, which will prevent emergence of the seedlings. Later seedlings are less likely to be affected by soil crusting, but are more prone to failure if the soil dries out before establishment.**

**Seed must be placed no more than ½ inch deep in the soil. Native grass seeds do not have enough endosperm reserves to emerge from depths greater than ½ inch.**

**No fertilizer is applied during the establishment year.**

**126,000 seeds/lb. (USDA, NRCS. 2004).**

**95-150,000 seeds/lb. (Hassell, et al. 1996).**

Establishment Phase: **If moisture is available in the seed zone, germination in the field will begin in 8-10 days and is usually complete in 14 days.**  
**Bromoxynil may be used for broadleaf weed control while the grass is in the seedling stage. Phenoxy herbicides should not be applied until the seedlings have begun to tiller. Cultivation should be used with caution on young seedlings. They are easily uprooted or covered with soil.**

Length of Establishment Phase: **1 growing season**

Active Growth Phase: **Established seed increase plantings are cultivated and rogued to control weeds and off-type grasses. Phenoxy herbicides may be used before the plants reach the boot stage.**  
**80 lbs/acre of nitrogen fertilizer is applied in the fall. Seed increase plantings will produce seed in the second season and continue to produce abundant seed for 4-5 more seasons.**

Length of Active Growth Phase: **4-5 growing seasons**

Hardening Phase:

Length of Hardening Phase:

Harvesting, Storage and Shipping: **Seed ripens in mid to late July in the Pullman area. When the inflorescence begins to dry and the seed is in the soft to hard dough stage but before it shatters from the inflorescence, plants are cut with a swather and laid in windrows in the field. Windrows are allowed to dry in the field for 6-7 days, then threshed with a combine equipped with a grass pickup attachment on the header. Harvested seed is stored at ambient temperatures in boxes or woven bags until cleaned.**

Length of Storage:

Outplanting performance on typical sites:

Other Comments: **Secar was released as a cultivar of bluebunch wheatgrass, *Pseudoroegneria spicata* ssp. *spicata* (*Agropyron spicatum*) but was later determined to be a new species of *Elymus* (Carlson & Barkworth 1997.**

**Consult with a licensed pesticide professional about any possible pesticide usage. Before applying any pesticide, read and follow the directions on the label.**

**No insect or disease problems have been noted.**

**Clean seed retains high germination for at least ten years under cool, dry storage conditions. High heat and/or high humidity reduce seed storage life.**

References: **Carlson, Jack R., and Mary E. Barkworth. 1997. *Elymus wawawaiensis*: A Species Hitherto confused with *Pseudoroegneria spicata* (Triticeae, Poaceae). *Phytologia* 83:312-320.**

**Hassell, et al. 1996. Seeding Rate Statistics for Native and Introduced Species. USDI National Park Service and USDA Natural Resources Conservation Service.**

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

**Kelley, Clarence A. 1988. Basics of Establishing Grass Seedings for Conservation. In: 1988 Annual Tech. Report. USDA, NRCS, Pullman Plant Materials Center. Pullman, WA.**

**USDA, NRCS. 2004. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.**

**Citation:**

Skinner, David M. 2006. Propagation protocol for production of *Elymus wawawaiensis* J. Carlson & Barkworth (Secar) ' ' seeds ( ); Pullman Plant Materials Center, Pullman, Washington. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 21 February 2006). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.