

# Protocol Information

Derek Tilley  
Agronomist  
USDA NRCS - Aberdeen Plant Materials Center  
PO Box 293  
Aberdeen, Idaho 83210  
208-397-4133  
208-397-3104  
derek.tilley@id.usda.gov  
<http://plant-materials.nrcs.usda.gov/idpmc>



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Family Scientific Name: **Apiaceae**

Family Common Name: **Carrot family**

Scientific Name: ***Lomatium triternatum* (Pursh) Coulter & Rose**

Common Name: **Nineleaf biscuitroot**

Species Code: **LOTR2**

Ecotype: **Intermountain West**

General Distribution: **Nineleaf biscuit is native to western North America, occurring from northeastern California to British Columbia and east to Alberta and Colorado.**

Propagation Goal: **Seeds**

Propagation Method: **Seed**

Product Type: **Propagules (seeds, cuttings, poles, etc.)**

Time To Grow: **4 Years**

Target Specifications: **Field produced seed with >95% purity.**

Propagule Collection: **Seed matures in July or August. Wildland seed is easily hand collected. The seed disarticulates readily from the stems, and very clean, small collections can be made by shaking ripened inflorescences over a bag or tarp.**

Propagule Processing: **Minor screening to remove sticks provides excellent purity. Additional cleaning can be done with a small air-screen cleaner. There are approximately 42,000 seeds/lb (Monsen and others 2004).**

Pre-Planting Treatments: **Nineleaf biscuitroot requires an extensive stratification period for germination. Fall-dormant seeding is required for field plantings.**

Growing Area Preparation/

Annual Practices for Perennial Crops: **Seed can be sown in rows at 82 pure live seeds (PLS)/m (25 PLS/ft) or into weed barrier fabric at 40 to 60 cm (18 to 24 in) spacing. All seeding should be completed as dormant fall seeding to allow natural stratification to occur.**

Establishment Phase: **Above ground growth is slow as the plants expend energy developing a substantial taproot. Plants grow in early spring and go dormant in mid-summer, giving the appearance of mortality.**

**In the first year, most plants will only produce a few leaves.**

**Length of Establishment Phase: 1 yr**

**Active Growth Phase: Most plants will not produce flowers or fruit during the first 2 to 3 years of growth. Seed production fields at Aberdeen, Idaho did not produce flowers or seed until the fourth year of establishment. Good weed control can be achieved through the use of weed barrier fabric and hand roguing. Because nineleaf biscuitroot enters dormancy in early summer, foliar herbicide applications of glyphosate to surrounding weeds are possible after senescence. In preliminary herbicide tolerance trials, seed yields were reduced by early spring bromoxynil applications (Shock and others 2010b). Highest seed yields have been achieved with the use of supplemental irrigation. Shock and others (2010) showed a significant positive response to irrigation with 10 cm (4 in) additional water at Ontario, Oregon. Ontario has a mean annual precipitation of 24 cm (9.5 in), bringing the total received water to approximately 36 cm (14 in) for optimum seed production.**

**Harvesting, Storage and Shipping: Seed can be harvested in production fields via a vacuum type harvester or flail vac. Seed is cleaned using an air screen cleaner. Purities approximating 100% are achievable with minimal effort.**

**Length of Storage: Seed viability in proper storage conditions remains high for 3 to 4 years (Monsen and others 2004).**

**Outplanting performance on typical sites: The seed can be broadcast or drilled to 0.3 to 0.6 cm (1/8 to 1/4 in) into a well prepared, weed-free seed bed. This species should be seeded in late fall as a dormant planting to allow natural stratification. A single species seeding rate of approximately 26 lbs/ac provides 25 to 30 seeds/ft<sup>2</sup>. Seeding rates should be adjusted to the desired percentage for use in a mixture.**

**References: Baskin, Carol C, and J.M. Baskin. 2001. Seeds: Ecology Biogeography, and Evolution of Dormancy and Germination. School of Biological Sciences, University of Kentucky, Lexington, KY. Academic Press. p. 418. Stevens, R., and S.B. Monsen. 2004. Forbs for seeding range and wildlife habitats. In: S.B. Monsen, R. Stevens, and N.L. Shaw [compilers]. Restoring western ranges and wildlands. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. General Technical Report RMRS-GTR-136-vol-2. p. 425-466. Shock, CC, Feibert E, Saunders L, Shaw N. 2010. Native wildflower seed production with limited subsurface drip irrigation. Oregon State University Agricultural Experiment Station, 2009 Annual Report: 193-209. Shock CC, Ishida J, Feibert EBG, Shaw N. 2010. Native perennial forb tolerance to repeated annual applications of postemergence herbicides. Oregon State University Agricultural Experiment Station, 2009 Annual Report:213-217. Tilley D., St. John L. Ogle D., Shaw N, Cane J. 2010. Plant guide for fernleaf biscuitroot (*Lomatium triternatum*). USDA-Natural Resources Conservation Service, Idaho Plant Materials Center. Aberdeen, ID**

**Citation:**

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