

Plant Propagation Protocol for *Lomatium triternatum*, Nineleaf Biscuitroot

ESRM 412 – Native Plant Production

Taxonomy

Family Name:	Apiaceae, Carrot Family
Genus:	<i>Lomatium</i>
Species:	<i>triternatum</i>
Species Authority:	(Pursh) J.M. Coult. & Rose
Common Synonym(s):	N/A
Common Name(s):	Nineleaf Biscuitroot, broadnineleaf
Species Code (USDA):	LOTR2
Varieties:	<i>anomalum</i> (M.E. Jones ex J.M. Coult. & Rose) Mathias <i>brevifolium</i> (J.M. Coult. & Rose) Mathias <i>macrocarpum</i> (J.M. Coult. & Rose) <i>triternatum</i>
Sub-species:	N/A
Cultivars:	N/A

GENERAL INFORMATION

Geographical range:

From British Columbia through the Northwest States south through California and as far east as Montana.

Ecological distribution:

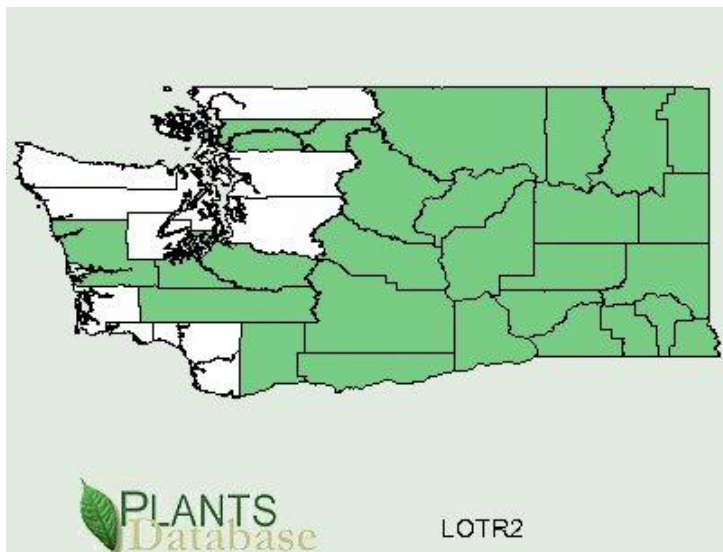
Open slopes and meadows.

Climate and elevation range:

Dry to fairly moist. Lowland to mid-elevations in the mountains (Hitchcock and Cronquist 1973, Gilkey and Dennis, 2001).

Local habitat and abundance:

Can be found in Western Washington, but more common east of the Cascades (Knoke & Giblin, 2006)



Plant strategy type/successional stage:

The range of this species in desert-shrubland areas (Shaw, 2007) indicates that it is drought tolerant.

Plant characteristics:

Perennial taproot forb (Shaw, 2007), 15-80 cm tall. Leaves mostly basal, downy to nearly hairless, divided into 3's several times, leaflets long (1.5-20cm), linear and lance shaped. Clusters of small yellow flowers appear in April (Shaw, 2007) from 5-30 rays, form compound umbels. Plants have both perfect and staminate flowers, which are more common in the later flowering umbels (Skinner). Bractlets are lance-shaped. Fruits are oblong or elliptic, 7-20mm long, with wings (Gilkey and Dennis, 2001) and ripen from May-June (Shaw, 2007). Seeds are tan in color (Skinner).

Wildlife Role:

Seeds serve as a food source for beetles and small mammals (Thompson, 1985).



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**Propagation Details
(Skinner)**

Ecotype: Paradise Creek Drainage (Pullman, WA Elevation ~2400 ft)

Propagation Goal: Plants

Propagation Method: Seed

Product Type: Plug container

Stock Type: 10 in³

Time to Grow: 18 months

Target Specifications: Tight root plug in container

Propagule collection:

Seed collected in late June-early July when inflorescence is dry, prior to dehiscence. Ripening phase varies for individual umbels. Harvest whole inflorescence or stripped fruits. Stored in paper bags at room temperature prior to cleaning.

Propagule Processing/Characteristics:

Inflorescence rubbed by hand then cleaned with an air column separator. Larger lots cleaned with air screen equipment. Clean seed stored in controlled climate with 40°F at 40% humidity.

Produced 63,812 seeds per pound, 141 seeds/gram. Seeds may show signs of insect damage but can be removed with an air column separator.

Pre-planting Propagule Treatments:

Cold Moist Stratification required possibly followed by cool outdoor conditions in spring. Skinner refers to unpublished data indicating that high germination was achieved from sowing containers in November and storing them outdoors. Germination did not occur without stratification or following 30 days of moist cold stratification. Seedlings died when brought into the greenhouse.

Growing Area Preparation:

Ray Leach Super cell cone-tainers (10 in³) filled with Sunshine #4 were sown with seeds in November and dressed with a thin layer of coarse grit. Cone-tainers were watered deeply and placed outside.

Establishment Phase:

Containers kept outside, watered as needed. Germination begins when temperatures rise in March, lasts 2-4 weeks.

Length of Establishment Phase: 3-4 Months**Active Growth Phase:**

Plants watered as needed and fertilized weekly with a complete, water soluble fertilizer. Move to lath house in early June. No growth or fertilizer during summer months, plants go dormant. Limit watering to prevent complete drying.

Length of Active Phase: 4 months**Hardening Phase:** N/A, grown outside.**Length of Hardening Phase:**N/A**Harvesting, Storage and Shipping:**

Plants stored in a lath house through winter. Mulch or foam sheets can be used to provide protection until spring temperatures begin to rise, but should include measures to prevent rodent damage. Rodents feed on the caudex during the winter and can kill plants.

Length of Storage: Not given**Guidelines for Outplanting:**

Transplant in early May using drilled 1.5 inch diameter holes. If planted for seed increase without competitors, survival is close to 100%. Installing with existing vegetation may reduce survival and vigor depending on weather conditions after planting. Plants go dormant in June. Flowering and seed production occur 1-2 years following outplanting, usually at 2 years.

Propagation Details

(Barner, 2007)

Ecotype: Lakeview Oregon, 5000 ft. elevation

Propagation Goal: Seeds

Propagation Method: Seed

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

Propagule collection: Hand collected 2.5 lbs into paper bag

Propagule Processing/Characteristics:

Seed lot cleaned with laboratory brush machine (Westrup Model LA-H) at medium speed with a #20 mantel. Air-screened with a office Clipper using a top screen, 1/12 round and a bottom screen, 7 x 3/4 cross slot, then rescreened with a top screen, 1/12 round and a bottom screen, 18 round, using medium speed and medium air.

Produced 47,250 seeds per pound

99% Purity

X-Ray (100 seeds): 86% filled

Harvesting, Storage and Shipping: Cold Storage (33-38°F)

Not Documented:

Stock Type:

Time to Grow:

Target Specifications:

Pre-planting Propagule Treatments:

Growing Area Preparation:
Establishment Phase:
Length of Establishment Phase:
Active Growth Phase:
Length of Active Phase:
Hardening Phase:
Length of Hardening Phase:
Length of Storage:
Guidelines for Outplanting:

Propagation Details **(DeBolt and Parkinson)**

Ecotype: Malheur County, Oregon. Elevation ~ 4600ft

Propagation Goal: Plants

Propagation Method: Seed

Product Type: Plug container

Propagule collection:

Fruits collected by hand stripping compound umbels into containers. Fruit is mature when it turns brown and opens easily, 5-8 weeks after flowering which occurs between March and May, varying by localized elevation and climate conditions.

Propagule Processing/Characteristics:

Fruits were dried and treated for insect pests by storing in a standard freezer for 48 hours. Seeds were cleaned using a ½" chicken wire mesh, hand sorting, then screened through a #8 Standard Testing Sieve. Seeds with irregular uniformity or density were discarded.

Storage: Seeds stored in brown glass bottle at room temperature for 18 months.

Length of Storage: 18 months

Not Documented:

Stock Type:
Time to Grow:
Target Specifications:
Pre-planting Propagule Treatments:
Growing Area Preparation:
Establishment Phase:
Length of Establishment Phase:
Active Growth Phase:
Length of Active Phase:
Hardening Phase:
Length of Hardening Phase:
Guidelines for Outplanting:

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*Note: The protocol template used was modified by J.D. Bakker from that available at:
<http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>