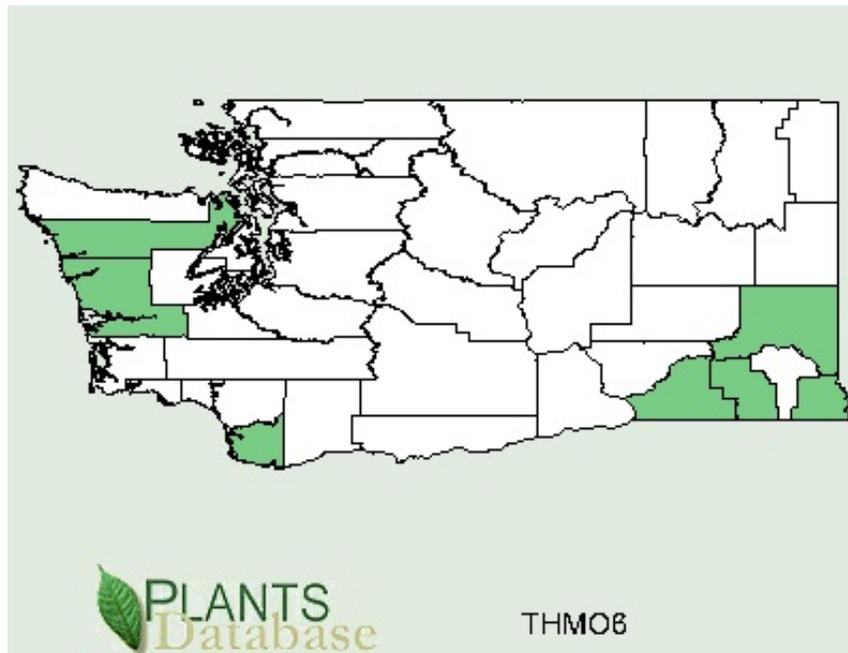
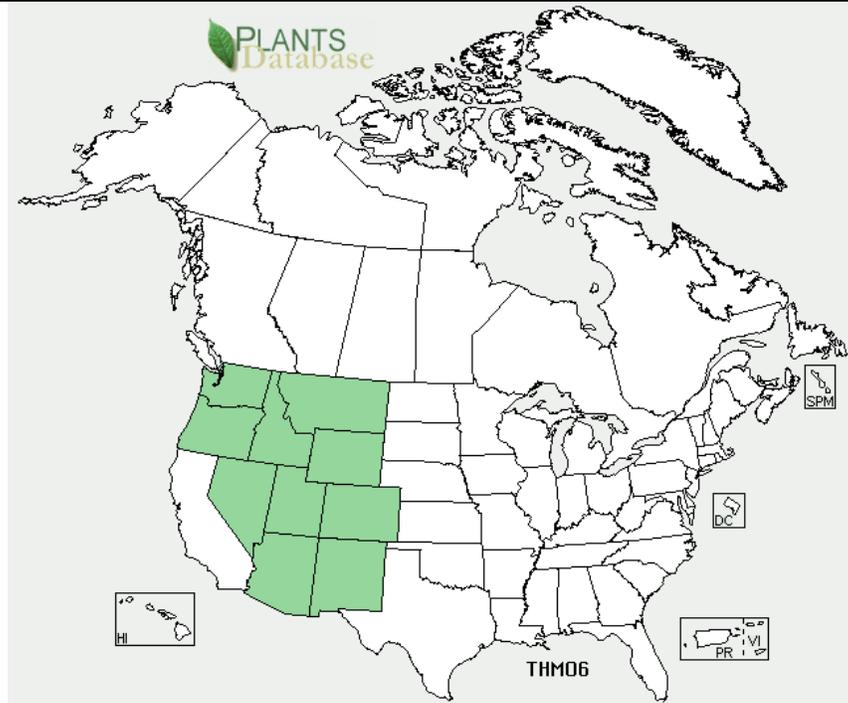


**Plant Propagation Protocol for *Thermopsis montana* Nutt.**  
ESRM 412 – Native Plant Production

<b>TAXONOMY</b>	
<b>Family Names</b>	
Family Scientific Name:	Fabaceae
Family Common Name:	Legume Family (Knight <i>et al.</i> 299); Pea Family (USDA website)
<b>Scientific Names</b>	
Genus:	<i>Thermopsis</i> R. Br.
Species:	<i>montana</i>
Species Authority:	Nutt.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	<p><i>Thermopsis montana</i> subsp. <i>ovata</i> B. L. Rob. ex Piper [≡ <i>Thermopsis montana</i> var. <i>ovata</i>]</p> <p><i>Thermopsis rhombifolia</i> var. <i>montana</i> (Nutt.) Isely [≡ <i>Thermopsis montana</i> var. <i>montana</i>]</p> <p><i>Thermopsis rhombifolia</i> var. <i>ovata</i> (B. L. Rob. ex Piper) Isely [≡ <i>Thermopsis montana</i> var. <i>ovata</i>]</p> <p><i>Thermopsis xylorhiza</i> A. Nelson [= <i>Thermopsis montana</i> var. <i>ovata</i>]</p> <p><i>Thermopsis montana</i> Nutt. var. <i>hitchcockii</i> (Isely) M. Mendenhall</p> <p>Source: (USDA: <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?316991">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?316991</a>)</p>
Common Name(s):	golden-pea, yellow pea, false lupine, mountain godelbanner,
Species Code (as per USDA Plants database):	THM06

## GENERAL INFORMATION

Geographical range  
(distribution maps  
for North  
America and  
Washington state)



<http://plants.usda.gov/java/profile?symbol=THM06>

Ecological  
distribution  
(ecosystems it  
occurs in, etc):

Moist meadows, roadside ditches (Robson *et al.* 346); open conifer woods (Kruckeberg 179); rocky slopes and prairies (Burrell *et al.* 179).

Climate and elevation range	Elevation: 5000-9000 feet (Rydberg 197). Full sun to part shade. Moist, well drained soil (Robson <i>et al.</i> 346)
Local habitat and abundance; may include commonly associated species	From Montana and Washington to Colorado, Utah, and Oregon. (Rydberg 197)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Contains toxins that cause muscle degeneration in cattle. (Knight <i>et al.</i> 299)
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Perennials herbs. Rhizomatous root system. (Coulter 271)
<b>PROPAGATION DETAILS</b>	
Information in the propagation section is directly quoted from the Native Plant Network website. Propagation dated 3/29/2005 < <a href="http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2957">http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2957</a> >	
Ecotype	Palouse River near Potlatch, Idaho
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	4 Months
Target Specifications	Tight root plug in container.
Propagule Collection (how, when, etc):	Seeds are collected when the pods begin to split in July and August. Pods can be collected individually for maximum seed yield or the entire stalk may be cut.

Propagule Processing/Propagule Characteristics	Small amounts are crushed by hand to free the seed, then cleaned with an air column separator. Larger amounts can be threshed with a hammermill, then cleaned with air screen equipment. Seeds are large and easy to clean.
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	The seed coat restricts water uptake and germination is increased by scarification. Unpublished data from trials at the Pullman PMC showed 39% germination from untreated seed. Seed scarified in hot water at 180 degrees F germinated at 93%. Scarification at 210 degrees F resulted in 92% germination. Seed scarified by rubbing between two pieces of sandpaper attained 56% germination, but the degree of scarification is difficult to control. 100 seeds scratched with a needle to break the seed coat germinated at 84%, demonstrating that the sandpaper scarification was inadequate. Unscarified seed stratified under cool, moist conditions for 30 days germinated at 26% and seed soaked in 110 degree F running tapwater for 3 hours prior to planting reached 29% germination.
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Water is boiled, then removed from the heat source and allowed to cool to 180 degrees F., then seed is placed in the hot water. It is allowed to cool for several hours before planting. In January scarified seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell containers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in containers to allow deep watering. A thin layer of pea gravel is applied to prevent seeds from floating. Containers are watered deeply. Seed should be inoculated with the proper Rhizobium species prior to planting.
Establishment Phase (from seeding to germination):	Medium is kept moist until germination occurs. Germination occurs over a period of 1 month, although around 50% occurs within 10-14 days of planting. Germination of the other treatments also occurred over an extended period.
Length of Establishment Phase:	1 month
Active Growth Phase (from germination until plants are no longer actively growing):	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:	2 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 (of seedlings, between nursery and outplanting):	
Guidelines for 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 occurs the year after transplanting.
Other Comments	Insects have been noticed to prey on the seed.

### **INFORMATION SOURCES**

References (full citations):	<ul style="list-style-type: none"> <li>• Robson, Cathleen A., Alice Richter and Marianne Filbert. <u>Encyclopedia of Northwest Native Plants for Gardens and Landscapes</u>. Portland: Timber Press, 2008.</li> <li>• Kruckeberg, Arthur R. <u>Gardening with Native Plants of the Pacific Northwest: An Illustrated Guide</u>. Seattle and London. University of Washington Press. 1982</li> <li>• Knight, Anthony P; Richard G. Walter, <u>A guide to plant poisoning of animals in North America</u>. Teton NewMedia, 2001</li> <li>• Burrell , C. Colston, Janet Marinelli, Bonnie Harper-Lore, Brooklyn Botanic Garden, <u>Native alternatives to invasive plants</u>. Brooklyn Botanic Garden, 2006</li> <li>• Rydberg, P.A., <u>Flora of Colorado</u>. Fort Collins. Experiment Station, 1906</li> <li>• Coulter, John Merle; Aven Nelson, <u>New manual of botany of the Central Rocky Mountains (vascular plants)</u>. New York, Cincinnati, Chicago, American Book Company, 1909</li> <li>• USDA plant database: <a href="http://plants.usda.gov/java/profile?symbol=THMO6">http://plants.usda.gov/java/profile?symbol=THMO6</a> (accessed May 10,2009)</li> <li>• Native Plant Network Protocol Information: &lt;<a href="http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2957">http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2957</a>&gt;</li> </ul>
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Other Sources Consulted	
Protocol Author (First and last name):	Basel Ismail
Date Protocol Created or Updated (MM/DD/YY):	May 13, 2009

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<http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>