

Plant Propagation Protocol for *Lathyrus vestitus*

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/LAVE2.pdf>



Lathyrus vestitus ©2018, Stacie Wolny²

TAXONOMY

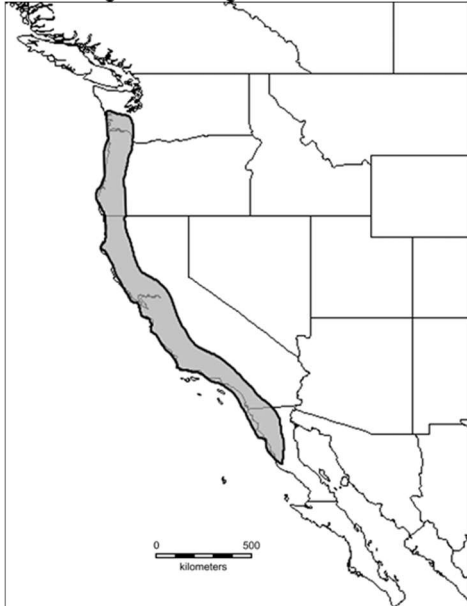
Plant Family	
Scientific Name	Fabaceae ¹
Common Name	Pea Family ¹
Species Scientific Name	
Scientific Name	<i>Lathyrus vestitus</i> Nutt. ¹
Varieties	
Sub-species	<i>Lathyrus vestitus</i> Nutt. ssp. <i>alefeldii</i> (T.G. White) Broich ¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>bolanderi</i> (S. Watson) C.L. Hitchc. ¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>laetiflorus</i> (Greene) Broich ¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>laevicarpus</i> Broich ¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>vestitus</i> ¹
Cultivar	
Common Synonym(s)	<i>Lathyrus alefeldii</i> T.G. White ¹ <i>Lathyrus laetiflorus</i> Greene ssp. <i>alefeldii</i> (T.G. White) C.L. Hitchc. ¹ <i>Lathyrus laetiflorus</i> Greene var. <i>alefeldii</i> (T.G. White) Jeps. ¹

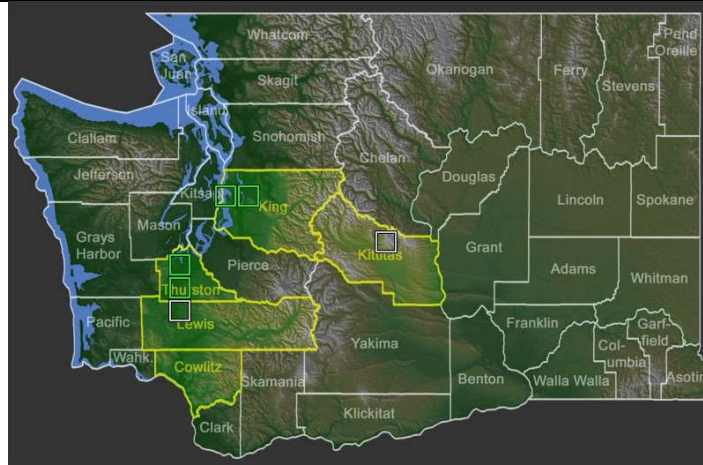
	<p> <i>Lathyrus strictus</i> Nutt.¹ <i>Lathyrus vestitus</i> Nutt. var. <i>alefeldii</i> (T.G. White) Isely¹ <i>Lathyrus bolanderi</i> S. Watson¹ <i>Lathyrus ochropetalus</i> Piper¹ <i>Lathyrus peckii</i> Piper¹ <i>Lathyrus polyphyllus</i> Nutt. var. <i>insecundus</i> Jeps.¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>ochropetalus</i> (Piper) C.L. Hitchc.¹ <i>Lathyrus vestitus</i> Nutt. var. <i>ochropetalus</i> (Piper) Isely¹ <i>Lathyrus laetiflorus</i> Greene¹ <i>Lathyrus laetiflorus</i> Greene ssp. <i>barbarae</i> (T.G. White) C.L. Hitchc.¹ <i>Lathyrus laetiflorus</i> Greene ssp. <i>glaber</i> C.L. Hitchc.¹ <i>Lathyrus strictus</i> Nutt. var. <i>barbarae</i> (T.G. White) Jeps.¹ <i>Lathyrus strictus</i> Nutt. var. <i>thacheriae</i> Jeps.¹ <i>Lathyrus venosus</i> Muhl. ex Willd. var. <i>grandiflorus</i> Torr.¹ <i>Lathyrus violaceus</i> Greene var. <i>barbarae</i> T.G. White¹ <i>Lathyrus puberulus</i> T.G. White ex Greene¹ <i>Lathyrus quercetorum</i> A. Heller¹ <i>Lathyrus vestitus</i> Nutt. ssp. <i>puberulus</i> (T.G. White ex Greene) C.L. Hitchc.¹ <i>Lathyrus vestitus</i> Nutt. var. <i>vestitus</i>¹ <i>Lathyrus vestitus</i> Nutt. var. <i>violaceus</i> (Greene) Abrams¹ <i>Lathyrus violaceus</i> Greene¹ </p>
--	--

Common Name(s)	Pacific pea, Alefeld's pea, Bolander's pea ¹
----------------	---

Species Code (as per USDA Plants database)	LAVE2 ¹
--	--------------------

GENERAL INFORMATION

Geographical range	<p>Washington, Oregon, California¹</p>  <p>Distribution of <i>Lathyrus vestitus</i>⁵</p>
--------------------	---



Distribution of *Lathyrus vestitus* in Washington¹³

Ecological distribution	Pacific coastal mountains, from Puget Sound to Baja California ⁴ , chaparral in southern parts of its range ⁵
Climate and elevation range	0 to 1910m, receiving 38-251cm annual precipitation, temperature ranges of 10-33°C ²
Local habitat and abundance	Temperate coniferous forest, pollinated by bees and butterflies ⁴
Plant strategy type / successional stage	Weed ⁵
Plant characteristics	Perennial herb (forb) ² , vine ³ up to 3m tall ⁵ with white to dark red-purple blooms ⁴ and alternate leaves ³ , morphological variation as one goes south along the West coast ⁴ , woody rhizomes giving rise to several stems, inflorescence a raceme of 5-16 flowers, leaves paripinnate, 7-16 seeds per legume ⁵
PROPAGATION DETAILS (Container Method)	
Ecotype	n/a
Propagation Goal	Plants and/or seeds
Propagation Method	Seed ⁵
Product Type	Container ⁵
Stock Type	n/a
Time to Grow	If using pots, plants sown in autumn are generally ready for outplanting in spring (approximately 6 months). ^{12*}
Target Specifications	n/a
Propagule Collection Instructions	Seed pods may be collected when they become to turn gray and the plant turns yellow, indicating maturity. Seeds may be collected by removing the plant from the site entirely or removing fruiting branches. ^{7*}
Propagule Processing/Propagule Characteristics	22.708g per 1000 seeds. <i>Lathyrus</i> seeds are primarily orthodox. ⁹
Pre-Planting Propagule Treatments	Pods or plants may be dried and threshed, either by trampling or beating with a stick. Seeds are more resistant to damage and will remain intact. Seeds are then winnowed, cleaned, and dried for several days before storage. ^{7*} Seeds are stored short term at 25% humidity and 4°C. Long term storage is kept at -20°C. ^{8*}

Growing Area Preparation / Annual Practices for Perennial Crops	Seeds can be planted in rootainers in seed compost and topped with a layer of vermiculite. Alternatively, seeds can be placed in a large pot 2-3cm apart. ^{12*}
Establishment Phase Details	To incite imbibition, place seeds in airtight container on a layer of moist vermiculite or a damp towel, and sow as soon as seeds swell or sprout. ^{12*} The genus <i>Lathyrus</i> typically has a germination rate of >90%. ^{8*}
Length of Establishment Phase	Specific information not found. Seeds should germinate within the season. ^{7*}
Active Growth Phase	Plants require shade or partial shade. ³ If sown in pots or rootainers, seedlings can be transferred to larger pots (at least 9cm) once they reach 3.5 cm tall. ^{12*} <i>Lathyrus vestitus</i> requires physical support in order to climb. ⁵ Once seedlings reach 10cm, removal of the tip of the shoot can promote branching. ^{12*}
Length of Active Growth Phase	Specific information not found. Growing season lasts 3-12 months. ²
Hardening Phase	Keep outside during day for one week, then keep outside during day and night for second week. ^{12*} If seeking to keep plant green during winter, shelter and frost protection are advisable. Stems can be cut down when side shoots develop in winter. ⁵
Length of Hardening Phase	10-14 days
Harvesting, Storage and Shipping	If propagating for seed, seed can be collected as described in “Propagule Collection Instructions.”
Length of Storage	If sown in autumn, keep in cold greenhouse until transplanting in spring. ^{12*}
Guidelines for Outplanting / Performance on Typical Sites	Provide compost or manure and the amount of general-purpose fertilizer recommended on the package. Space plants 20-30cm apart. Water plants thoroughly before and after transplanting. ^{12*} Hardy roots can survive in poor soils, including heavy clays, and require few production inputs due to high rates of nitrogen fixation. <i>Lathyrus</i> is quite disease resistant compared to other legumes. ^{10*} Plants typically flower between March and June. ⁵
Other Comments	*These sources may not be completely applicable to the species <i>Lathyrus vestitus</i> . Sources 8, 10, 11, and 12 all speak generally on the <i>Lathyrus</i> genus, and sources 6 and 7 describe closely related species within the genus. However, source 5 indicates that germination in <i>Lathyrus vestitus</i> is achieved in the same way as other <i>Lathyrus</i> species. It is inadvisable to consume peas from the <i>Lathyrus</i> genus due to presence of the ODAP neurotoxin, which can cause a paralysis known as lathyrism. ⁶ Research is being done on how to safely consume peas from the <i>Lathyrus</i> genus. ¹⁰ Because the <i>Lathyrus</i> genus is not typically commercially propagated, there are few regulations on obtaining and cultivating seeds. ⁸
PROPAGATION DETAILS (Direct Sowing Method)	
Ecotype	n/a
Propagation Goal	Plants, nitrogen fixing roots ^{7*} , and/or seeds
Propagation Method	Seed ⁵
Product Type	Seed ^{10*}

Stock Type	n/a
Time to Grow	12-14 weeks (if sown in spring) ^{12*}
Target Specifications	n/a
Propagule Collection Instructions	Seed pods may be collected when they become to turn gray and the plant turns yellow, indicating maturity. Seeds may be collected by removing the plant from the site entirely or removing fruiting branches. ^{7*}
Propagule Processing/Propagule Characteristics	22.708g per 1000 seeds. <i>Lathyrus</i> seeds are primarily orthodox. ⁹
Pre-Planting Propagule Treatments	Pods or plants may be dried and threshed, either by trampling or beating with a stick. Seeds are more resistant to damage and will remain intact. Seeds are then winnowed, cleaned, and dried for several days before storage. ^{7*} Seeds are stored short term at 25% humidity and 4°C. Long term storage is kept at -20°C. ^{8*} To incite imbibition, place seeds in airtight container on a layer of moist vermiculite or a damp towel, and sow as soon as seeds swell or sprout. ^{12*}
Growing Area Preparation / Annual Practices for Perennial Crops	Sow in spring or autumn. ^{12*} Seeds of <i>Lathyrus</i> species can germinate underground and are sometimes mixed with cow dung before sowing. ^{7*} They can be tolerant of both drought and flooding. In South Asia, seeds are distributed in standing water. ^{10*}
Establishment Phase Details	The genus <i>Lathyrus</i> typically has a germination rate of >90%. ^{8*}
Length of Establishment Phase	Specific information not found. Seeds should germinate within the season. ^{7*}
Active Growth Phase	<i>Lathyrus vestitus</i> requires physical support in order to climb. ⁵ Once seedlings reach 10cm, removal of the tip of the shoot can promote branching. ^{12*}
Length of Active Growth Phase	Specific information not found. Growing season lasts 3-12 months. ²
Hardening Phase	Stems will die during non-growing season, leaving rhizomes behind. ^{11*}
Length of Hardening Phase	n/a
Harvesting, Storage and Shipping	If propagating for seed, seed can be collected as described in “Propagule Collection Instructions.”
Length of Storage	n/a
Guidelines for Outplanting / Performance on Typical Sites	Hardy roots can survive in poor soils, including heavy clays, and require few production inputs due to high rates of nitrogen fixation. <i>Lathyrus</i> is quite disease resistant compared to other legumes. ^{10*} Plants typically flower between March and June. ⁵ If seeds are sown in spring, they should flower in 12-14 weeks. ^{12*}
Other Comments	*These sources may not be completely applicable to the species <i>Lathyrus vestitus</i> . Sources 8, 10, 11, and 12 all speak generally on the <i>Lathyrus</i> genus, and sources 6 and 7 describe closely related species within the genus. However, source 5 indicates that germination in <i>Lathyrus vestitus</i> is achieved in the same way as other <i>Lathyrus</i> species. It is inadvisable to consume peas from the <i>Lathyrus</i> genus due to presence of the ODAP neurotoxin, which can cause a paralysis known as lathyrism. ⁶ Research is being done on how to safely consume peas from the <i>Lathyrus</i> genus. ¹⁰

Because the *Lathyrus* genus is not typically commercially propagated, there are few regulations on obtaining and cultivating seeds.⁸

INFORMATION SOURCES

References	<p>¹ Kartesz, J. T. (n.d.). <i>Lathyrus vestitus</i> Nutt. Pacific pea. Retrieved April 18, 2020, from https://plants.usda.gov/core/profile?symbol=LAVE2</p> <p>² The Calflora Database. (2020). <i>Lathyrus vestitus</i> Nutt. Retrieved April 23, 2020, from https://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=4626</p> <p>³ TWC Staff. (2009, April 8). Plant Database. Retrieved April 23, 2020, from https://www.wildflower.org/plants/result.php?id_plant=LAVE2</p> <p>⁴ Broich, S. (1987). Revision of the <i>Lathyrus vestitus</i>-<i>laetiflorus</i> Complex (Fabaceae). <i>Systematic Botany</i>, 12(1), 139-153. doi:10.2307/2419224</p> <p>⁵ Norton, S., & Kenicer, G. (2008, December 18). LATHYRUS VESTITUS. <i>Curtis's Botanical Magazine</i> 25(4), 333-341. Retrieved April 26, 2020, from https://onlinelibrary-wiley-com.offcampus.lib.washington.edu/doi/full/10.1111/j.1467-8748.2008.00638.x</p> <p>⁶ Hanbury, C. D., White, C. L., Mullan, B. P., & Siddique, K. H. M. (2000, October 9). A review of the potential of <i>Lathyrus sativus</i> L. and <i>L. cicera</i> L. grain for use as animal feed. <i>Animal Feed Science and Technology</i> 87 (1-2), 1-27. Retrieved April 26, 2020, from https://www.sciencedirect.com/science/article/pii/S0377840100001863#aep-section-id10</p> <p>⁷ Campbell, C. G. (1997). <i>Grass pea: Lathyrus sativus</i> L. Rome: International Plant Genetic Resources Institute.</p> <p>⁸ Mathur, P.N., Alercia, A., Jain, C. (2005). <i>Lathyrus germplasm collections directory</i>. International Plant Genetic Resource Institute: Bioversity International.</p> <p>⁹ Kew Royal Botanic Gardens. (n.d.). Seed Information Database. Retrieved May 2, 2020, from https://data.kew.org/sid/SidServlet?ID=13475&Num=08g</p> <p>¹⁰ Patto, M.C.V., Skiba, B., Pang, E.C.K. et al. <i>Lathyrus</i> improvement for resistance against biotic and abiotic stresses: From classical breeding to marker assisted selection. <i>Euphytica</i> 147, 133 (2006). https://doi.org/10.1007/s10681-006-3607-2</p> <p>¹¹ Kenicer, G. (2008). AN INTRODUCTION TO THE GENUS LATHYRUS L. <i>Curtis's Botanical Magazine</i>, 25(4), 286-295. Retrieved May 13, 2020, from www.jstor.org/stable/45065869</p> <p>¹² Royal Horticulture Society. (2020). How to grow lathyrus. Retrieved May 13, 2020, from https://www.rhs.org.uk/plants/popular/lathyrus/growing-guide</p> <p>¹³ WTU Herbarium, Burke Museum, & University of Washington. (2020). <i>Lathyrus vestitus</i>. Retrieved May 21, 2020, from http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Lathyrus%20vestitus</p>
Other Sources Consulted	<p>IPGRI. 2000. Descriptors for <i>Lathyrus</i> spp. International Plant Genetics Resource Institute, Rome, Italy.</p> <p>Peña-Chocarro, L., Zapata Peña, L. History and traditional cultivation of <i>Lathyrus sativus</i> L. and <i>Lathyrus cicera</i> L. in the Iberian peninsula. <i>Veget Hist Archaeobot</i> 8, 49–52 (1999). https://doi.org/10.1007/BF02042842</p> <p>Kruckeberg, A. R. et al. (2019). <i>Gardening with native plants of the Pacific Northwest</i> (Third Edition). Seattle: University of Washington Press. doi: MUSE.muse.jhu.edu/book/64259</p> <p>Kislev, M. (1989). Origins of the Cultivation of <i>Lathyrus sativus</i> and <i>L. cicera</i> (Fabaceae). <i>Economic Botany</i>, 43(2), 262-270. Retrieved May 13, 2020, from www.jstor.org/stable/4255161</p> <p>Jepson, W. L. (1902). <i>A School Flora for the Pacific coast</i>. New York: D. Appleton and Co.</p> <p>Love, S.L., & Akins, C.J. (2019). Fourth summary of the native seed germination studies of Norman C Deno: species with names beginning with letters L through O. <i>Native Plants Journal</i> 20(3), 279-304. https://www.muse.jhu.edu/article/746689.</p> <p>Boyer, L. (2011). Unknown and unprotected: the imperiled genetic resource of native plant populations on roadsides and private lands. <i>Native Plants Journal</i> 12(3), 276-284. https://www.muse.jhu.edu/article/460638.</p> <p>Heim, A., Nagase, A., Lundholm, J., & Wrathall, C. (2018). Germination ecology of native plant species for use in restoration and the urban landscape in Nova Scotia, Canada. <i>Native Plants Journal</i> 19(3), 201-215. https://www.muse.jhu.edu/article/713188.</p>
Protocol Author	Maria Rottersman

Date Protocol Created or Updated	June 4, 2020
--	--------------
