

Lotus corniculatus [简体中文](#) [正體中文](#)

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Fabales	Fabaceae

Common name

hop 'o my thumb (English), paprastasis garzdenis (English, Lithuania), komonica zwyczajna (English, Poland), Hornklee (German), kurdglisprchkhila (English, Georgia), devil's-claw (English), cuernecillo (Spanish), bloomfell (English), ragaine vanagnadzini (English, Latvia), loto corniculado (English, Spain), keltamaite (English, Finland), karingtand (English), palyavaya akatzyya (English, Belarus), kurdli prukhila (English, Georgia), harilik noiahammas (English, Estonia), cuernecillo del campo (Spanish), lyadvenetz zhigulevski (English, Russian Federation), lyadvenetz somnitelnyi (English, Russian Federation), lyadvenetz krymski (English, Russian Federation), lyadvenetz olgi (English, Russian Federation), lyadvenetz komarova (English, Russian Federation), lyadvenetz baltiiski (English, Russian Federation), lyadvenetz kavkazski (English, Russian Federation), lyadvenetz ruprekhta (English, Russian Federation), lyadvenetz rogyati (English, Russian Federation), lyadvenetz polevoi (English, Russian Federation), pied-de-poule (English, France), zayachchy bratki (English, Belarus), birdfoot deervetch (English), birdsfoot trefoil (English), cornette (French), ginestrina (English, Italy), cube (French), garden birdsfoot trefoil (English), Dutchman's clogs (English, England), crowtoes (English), garden bird's-foot-trefoil (English), cat's clover (English), rutvitza ragataya (English, Belarus), tryzaouka (English, Belarus), yellow treefoil (English), bird's-foot trefoil (English), ground honeysuckle (English), sheep-foot (English), upright trefoil (English), common lotus (English), ghizdei marunt (English, Russian Federation), Gemeiner Hornklee (English, Germany), hen-and-chickens (English, England), devil's fingers (English, England), lady's slippers (English, England), granny's toenails (English, England), gafgaz gurdotu (English, Azerbaijan), buinuzlu Gurdotu (English, Azerbaijan), lady's fingers (English, England), ekhdzherarvuit (English, Armenia), ebert khoshootzor (English, Mongolia), lotier corniculé (French), cornichão (English)

Synonym

Lotus corniculatus , var. *arvensis* (Schkuhr) Ser. ex DC.
Lotus ambiguus , Besser ex Spreng.
Lotus arvensis , Pers.
Lotus balticus , Miniaev
Lotus carpetanus , Lacaita
Lotus caucasicus , Kuprian
Lotus corniculatus , var. *arvensis* (Pers.) Ser.
Lotus corniculatus , var. *glaber* Opiz
Lotus corniculatus , subsp. *major* (Scop.) Gams
Lotus corniculatus , var. *major* (Scop.) Brand
Lotus filicaulis , Durieu
Lotus frondosus , (Freyn) Kuprian
Lotus japonicus , (Regel) K.larson
Lotus komarovii , Miniaev
Lotus major , Scop.
Lotus olgae , Klokov
Lotus peczoricus , Miniaev and Ulle
Lotus ruprechtii , Miniaev
Lotus ucrainicus , Klokov
Lotus zhegulensis , Klokov
Lotus ambiguus , Spreng
Lotus caucasicus , Kuprian.
Lotus ciliatus , sensu Schur
Lotus corniculatus , L. var. *crassifolia* Fr.
Lotus corniculatus , L. var. *kochii* Chrtkova
Lotus corniculatus , L. var. *maritimus* Rupr.
Lotus tauricus , Juz.

Similar species

Coronilla varia, *Trifolium* spp., *Medicago* spp., *Lotus pedunculatus*

Summary

Lotus corniculatus (bird's foot trefoil) is a low growing perennial legume that has long been valued as an agricultural crop. *Lotus corniculatus* is native to much of Europe, Asia and parts of Africa, but now has a near global distribution. Over most of its range, *Lotus corniculatus* is not considered invasive, although in a few areas it has out-competed native vegetation.



[view this species on IUCN Red List](#)

Species Description

Lotus corniculatus is a perennial, herbaceous member of the pea family (Fabaceae). It can be distinguished from all other members of the pea family by its five leaflets and head-like umbels of bright yellow flowers. *L. corniculatus* blooms from May-September in the United States. The root system includes a long tap root, which may be longer than 3 feet, and a fibrous mat near the soil surface consisting of secondary roots, rhizomes, and modified stems (stolons). (OSU, undated).

The stems of *L. corniculatus* are nearly square (USDA Forest Service, 2006), erect or sprawling on the ground, branched, either smooth or sparsely hairy, and up to one and a half feet long. (USGS-NRWRC, 2006). Numerous stems arise from a basal, well-developed crown with branches arising from leaf axils. (Frame, undated (a)) The leaves are alternate and pinnately compound. The leaflets are somewhat hairy, smooth, elliptic, rounded or pointed at the tip, and tapering to the base. They are up to 2/3 an inch long and 1/3 an inch wide, and lack stalks. The flowers are up to 2/3 an inch long, with ten stamens and superior ovaries. (USGS-NRWRC, 2006). "Ripe pods are cylindrical, 15-30mm long, 2-3mm wide, brown to almost black, borne at right angles to the top of the peduncle (hence 'bird's-foot' trefoil as the common name). Seeds are irregularly rounded, somewhat flattened, 1.3-1.5mm long, variable in colour at maturity, olive to brownish to almost black, frequently speckled and shiny." (Jones and Turkington, 1986). Seeds are ejected from the pods as the pods rupture at maturity (OSU, undated), averaging 375,000 seeds per pound. (Bush, 2002).

Notes

Lotus corniculatus seeds are one of the most common impurities of white clover seeds and some commercially available grasses. (OSU, undated). The Cornell University Poisonous Plants Information Database lists *L. corniculatus* as a potential poison. The primary poison contained in *L. corniculatus* is CN tannini, which affects cattle and sheep most often. (ASCU, 2003)

Lifecycle Stages

Lotus corniculatus sometimes behaves as a hemicryptophyte, dying back to a small crown of short shoots during the winter. In northern regions, it can also behave as a genophyte, losing all above ground parts during the winter. (Jones & Turkington, 1986). Unless cut, plants show one flush of growth per year above ground beginning in March/April and continuing until late June. (Jones & Turkington, 1986).

Uses

Strains of *L. corniculatus* selected after introduction from Europe are now of major importance as both a pasture and hay crop. (NewCROP, 1997). On well-drained soils with adequate moisture, *L. corniculatus* yields 4 tons of hay per acre. (Bush, 2002). *L. corniculatus* has a deep, branched root system that can tolerate both wet and moderately dry conditions, and is unusual among legumes in that it does not cause bloat in cattle. (NewCROP, 1997) "Birdsfoot trefoil is more tolerant of grazing than alfalfa and red clover, and will normally outlive red clover by several years." (UMass, 2006). Like many plants in the pea family, *L. corniculatus* is a nitrogen-fixer and is thus utilized to enhance poor pastures. (OSU, undated). Bird's foot trefoil is commonly used along sides of roads for erosion prevention (Bush, 2002). Being a nitrogen fixer, *L. corniculatus* has the potential to maintain vegetative cover of sand dunes by adding nitrogen to the soil. (Ede, 1997). It also provides food for elk, deer, Canadian geese (Bush, 2002) sheep, voles, and rabbits. (Jones & Turkington, 1986). At shooting preserves and around ponds, it provides cover for pheasants and ducks. (Bush, 2002).

Habitat Description

Lotus corniculatus thrives in temperate regions, inhabiting roadsides, old fields, and other disturbed soils (USGS-NRWC, 2006). In the British Isles, *L. corniculatus* is "widespread in grasslands and species-rich heath; also found on cliffs and as a pioneer in quarries and on roadside verges." (Jones and Turkington, 1986). It is "adapted to loam soils with good moisture holding capacity and also to heavy clay soils. It is not adapted to sandy soils. High soil temperatures appear to favour root diseases. Legume of choice where drainage or acidity are a problem. It will tolerate low levels of fertility but is productive only on soils with good fertility. Birdsfoot trefoil is a slow growing perennial legume adapted to cooler climates. It is slow to establish and being a light loving plant will not withstand much competition at the seedling stage." (UMass, 2006). It can tolerate a pH range of 5.5-7.5, and performs well on shallow or poorly drained soils compared to alfalfa. (Bush, 2002). A study in Australia showed that *L. corniculatus* has "important potential for low fertility acidic soils on tablelands and slopes where the Australian Annual Rainfall is 650-1000mm, especially in northern New South Wales" (Ayres, 2006). Although *L. corniculatus* prefers to grow in warm, moist places, it is intolerant of being inundated with water for prolonged periods. (Zheng, 2004).

Reproduction

Lotus corniculatus reproduces by seed and plants also spread by modified stems (stolons) and rhizomes. (OSU, undated). Jones & Turkington (1986) state that establishment of new plants from seed is rare. New shoots can arise from root crowns. (OSU, undated). The flowering period is indefinite, so the seeds set over a long summer period. Hard seeds overwinter in the soil prior to germinating and can build up seed banks. (Jones & Turkington, 1986). In some grasslands, *L. corniculatus* can flower in the first year and annually thereafter. (Jones & Turkington, 1986). The flowers are cross-pollinated by honey bees due to self-sterility. (Frame, undated (a)). After pollination, it takes between 24 and 71 days for plants to produce mature seeds. (Jones and Turkington, 1986).

General Impacts

Lotus corniculatus forms dense mats which choke out and shade native vegetation. It grows well in the arid midwest US and is problematic in prairies and open or disturbed areas such as roadsides. Prescribed burns facilitate seed germination, which threatens native prairies. (MNDNR, 2006). One study reported that suspected photosensitization occurred in lambs grazing *L. corniculatus*. One group of sucking lambs developed skin lesions on the back and ears. The tips of the ears in a few animals were shortened by 2-3 centimeters. (Stafford, 1995).

Management Info

Physical: To control small infestations of *L. corniculatus*, dig up plants by roots, making sure to remove all root fragments. (USDA Forest Service, 2006). For larger infestations, frequent mowing (more than once every 3 weeks) at a height of less than two inches (OSU, undated) for several years helps to control the plant but may set back native plants (USDA Forest Service, 2006). Controlled burns of *L. corniculatus* are not recommended because they increase seed germination and promote seedling establishment. (USDA Forest Service, 2006).

Chemical: *L. corniculatus* can be effectively controlled with general use herbicides such as: clopyralid, glyphosate, and triclopyr. (USDA Forest Service, 2006). Jones & Turkington (1986) report that morfamquat, ioxynil plus mecoprop, 2,4-D-mecoprop, dichlorprop, fenoprop, and dicamba are effective herbicide treatments on *L. corniculatus*, while MCPA-salt, 2,4-D-amine and ester have no effect. Acumen and basagran MCPB are considered very toxic herbicide treatments for *L. corniculatus* seedlings. Considerable damage to seedlings was caused by: brasoran, gesagard, and opogard; EPTC was considered an ineffective treatment. *L. corniculatus* showed no response to carbofuran or benomyl. (Jones & Turkington, 1986). "Spot spraying affected areas, (after re-greening from a burn or mowing), with clopyralid + surfactant + dye. (This selective herbicide also affects native plants of the sunflower and pea families.)" (MNDNR, 2006).

Pathway

Because of its nitrogen-fixing capabilities, *L. corniculatus* can be utilized to aid in sand dune revegetation. (Ede, 1997).

Principal source:

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

Publication date: 2006-11-16

ALIEN RANGE

[2] ARGENTINA	[6] AUSTRALIA
[1] AZERBAIJAN	[2] CANADA
[1] CHILE	[1] COSTA RICA
[2] GEORGIA	[1] GREECE
[1] ICELAND	[5] INDIA
[1] KAZAKHSTAN	[1] LEBANON
[1] MALTA	[1] MONGOLIA
[50] RUSSIAN FEDERATION	[1] SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDS
[1] SYRIAN ARAB REPUBLIC	[3] TAJIKISTAN
[1] TURKMENISTAN	[25] UKRAINE
[44] UNITED STATES	

BIBLIOGRAPHY

26 references found for *Lotus corniculatus*

Management information

[Auld, B., Morita, H., Nishida, T., Ito, M., & P. Michael. 2003. Shared exotica: Plant invasions of Japan and south eastern Australia. *Cunninghamia* 8\(1\): 147-152.](#)

Summary: Discusses the many common invasive plant species shared by Japan and south eastern Australia.

Available from: http://www.rbgsyd.nsw.gov.au/_data/assets/pdfnormal_file/58904/Cun8Aul147.pdf [Accessed 13 November 2006]

[Bush, T. 2002. BIRDSFOOT TREFOIL *Lotus corniculatus* L. Plant Fact Sheet. U.S. Department of Agriculture. Natural Resources Conservation Service.](#)

Summary: A great fact sheet with information on uses, especially agricultural.

Available from: http://plants.usda.gov/factsheet/pdf/fs_loco6.pdf [Accessed 14 November 2006]

[Frame, J. Undated. *Lotus corniculatus*. Grassland Species Index. Food and Agriculture Organization of the United Nations.](#)

Summary: Very explicit review of *L. corniculatus*, giving detailed scientific information.

Available from: <http://www.fao.org/AG/AGP/agpc/doc/Gbase/data/pf000344.htm> [Accessed 11 November 2006]

[Frame, J. Undated. *Lotus uliginosus* Schkur.. Grassland Species Index. Food and Agriculture Organization of the United Nations.](#)

Summary: Very explicit review of *L. uliginosus*, giving detailed scientific information.

Available from: <http://www.fao.org/AG/AGP/agpc/doc/Gbase/data/pf000345.htm> [Accessed 11 November 2006]

[Menashe, E. 2004. Some Invasive Non-Native Plants to Avoid Using in Landscape and Restoration Projects, A Partial List for the Puget Sound Area. Coastal Training Program, Washington.](#)

Summary: A list of potentially invasive non-native plants in puget sound.

Available from: <http://www.greenbeltconsulting.com/ctp/pdf/SomeInvasiveNonNatives.pdf> [Accessed 10 November 2006]

[Minnesota Department of Natural Resources \(MNDNR\). 2006. *Lotus corniculatus* The Minnesota Department of Natural Resources Website \(Online\).](#)

Summary: Contains good information on management and ecological threats posed by *L. corniculatus*.

Available from: <http://www.dnr.state.mn.us/invasives/terrestrialplants/herbaceous/birdsfoottrefoil.html> [Accessed 14 November 2006]

[Murray, C. & R.K. Jones. 2002. Decision Support Tool for Invasive Species in Garry Oak Ecosystems. Prepared by ESSA Technologies Ltd. For the Garry Oak Ecosystems Recovery Team. Victoria, B.C.](#)

Summary: This paper contains a decision making template for managers dealing with invasive species.

Available from: http://www.goert.ca/docs/goe_dst.pdf [Accessed 10 November 2006]

[USDA Forest Service. 2006. Bird s-Foot Trefoil *Lotus corniculatus*. Weed of the Week.](#)

Summary: A fact sheet a variety of different management methods and general characteristics.

Available from: http://www.na.fs.fed.us/fhnp/invasive_plants/weeds/birds-foot-trefoil.pdf [Accessed 11 November 2006]

[Varnham, K. 2006. Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.](#)

Summary: This database compiles information on alien species from British Overseas Territories.

Available from: <http://www.jncc.gov.uk/page-3660> [Accessed 10 November 2009]

General information

[Animal Science at Cornell University. \(ASCU\). 2003. *Lotus corniculatus*. Cornell University Poisonous Plants Informational Database \[Online Database\].](#)

Summary: Gives a brief description of bird s foot trefoil s potential as a poisonous plant.

Available from: <http://www.ansci.cornell.edu/plants/alphalist.html> [Accessed 14 November 2006]

[ARKive. 2006. Bird s-foot-trefoil \(*Lotus corniculatus*\). Wildscreen.](#)

Summary: A site awaiting information authenticity that states several common names for *L. corniculatus*.

Available from: http://www.arkive.org/species/ARK/plants_and_algae/Lotus_corniculatus/ [Accessed 10 November 2006]

[Ayers, J.F., Blumenthal, M.J., O Connor, J.W., and Lane, L.A.. 2006. Birdsfoot trefoil \(*Lotus corniculatus*\) and greater lotus \(*Lotus uliginosis*\) in perennial pastures in eastern Australia 2. Adaptation and applications of lotus-based pasture. *Australian Journal of Experimental Agriculture*. 46\(4\):521-534.](#)

Summary: This study investigated the potential of *L. corniculatus* and *Lotus uliginosus* as pasture crops under different different grazing management practices in Australia.

Available from: http://www.publish.csiro.au/?act=view_file&file_id=EA04242.pdf [Accessed 9 November 2006]

[Ede, F.J., Gadgil, R.L., Douglas, G.B., Lowe, A.T., & C.T.Smith. 1997. Stabilising sand dunes by revegetation: The role of introduced nitrogen-fixing plants. *Pacific Coasts and Ports. Proceedings Volume 1.* pp. 437-442.](#)

Summary: A great study about the capability of bird s foot trefoil to help revegetate sand dunes. [Accessed 10 November 2006]

[Invasive Plants Association of Wisconsin \(IPAW\) Science Committee. 2003. IPAW Working List of the Invasive Plants of Wisconsin. A call for comments and information. *Plants out of Place. Issue 4.*](#)

Summary: Basically gives a list of invasive plant species from Wisconsin.

Available from: <http://www.ipaw.org/newsletters/issue4.pdf> [Accessed 12 November 2006]

[ITIS \(Integrated Taxonomic Information System\). 2005. Online Database *Lotus corniculatus*](#)

Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=26362 [Accessed 7 November 2006]

[Jones, D. A., & Roy Turkington. 1986. Biological Flora of the British Isles. *Journal of Ecology*. Vol. 74, pp 1185-1212.](#)

Summary: A journal article containing very detailed information on characteristics, habitat, ditribution in the british isles.

Available from:

<http://www.jstor.org/view/00220477/di985463/98p03937/0?searchUrl=http%3a/www.jstor.org/search/BasicResults%3fhp%3d25%26si%3d1%26Query%3dlotus%2bcorniculatus&frame=noframe¤tResult=00220477%2bdi985463%2b98p03937%2b0%2cFF7FFF1F&userID=80adf028@vt.edu/01cc993311569310ebfcd040e&dpi=3&config=jstor> [Accessed 12 November 2006]

[Legume Web. 2005. *Lotus corniculatus*. International Legume Database & Information Service \(ILDIS\).](#)

Summary: An extensive global distribution of bird s foot trefoil and many common names.

Available from: <http://www.ildis.org/LegumeWeb?version~10.01> [Accessed 11 November 2006]

[New Crops Resource Online Program. \(NewCROP\). 1997. Birdsfoot trefoil. Center for New Crops & Plant Products. Purdue University. Department of Horticulture and Landscape Architecture.](#)

Summary: Describes the agricultural range and uses of *L. corniculatus*.

Available from: http://www.hort.purdue.edu/newcrop/Crops/Birdsfoot_trefoil.html [Accessed 13 November 2006]

[Ohio State Univeristy. \(OSU\). Undated. BIRDSFOOT TREFOIL *Lotus corniculatus*. *Ohio Perennial and Biennial Weed Guide*.](#)

Summary: A fact sheet with good information on similar species.

Available from: <http://www.oardc.ohio-state.edu/weedguide/singlerecord.asp?id=400> [Accessed 9 November 2006]

[Stafford, K.J., West, D.M., Alley, M.R. & G.C. Waghorn. 1995. Suspected photosensitization in lambs grazing birdsfoot trefoil. *Lotus corniculatus*. *New Zealand Veterinary Journal*. Vol. 43 No. 3, pp.114-117.](#)

Summary: Describes the potential photosensitization of lambs that graze on *L. corniculatus*.

Available from: <http://vt.library.ingentaconnect.com/content/nzva/nzvj/1995/00000043/00000003/art00008> [Accessed 12 November 2006]

[University of Massachusetts Amherst. 2006. Description and Adaptation of Birdsfoot Trefoil \(*Lotus corniculatus*\). *Crops, Dairy & Livestock Publications*.](#)

Summary: This source describes some characteristics and adaptations of *L. corniculatus*.

Available from: <http://www.umass.edu/cdl/publications/Birdfoot.htm> [Accessed 10 November 2006]

[Urban Forest Associates, Inc. 2002. Invasive Exotic Species Ranking for Southern Ontario.](#)

Summary: This source describes the invasive species of southern ontario and their effects on various natural settings.

Available from: <http://www.serontario.org/pdfs/exotics.pdf> [Accessed 9 November 2006]

[USDA-ARS. 2000. *Lotus corniculatus* National Genetic Resources Program. Germplasm Resources Information Network - \(GRIN\) \[Online Database\]. National Germplasm Resources Laboratory, Beltsville, Maryland.](#)

Summary: This site briefly outlines some characteristics of *L. corniculatus* and provides an exensive range data.

Available from: <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?300317> [Accessed 11 Novemeber 2006]

[USDA-NRCS. 2006. *Lotus corniculatus* The PLANTS Database. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.](#)

Summary: This profile contained excellent distribution information for the US and information on invasiveness.

Available from: <http://plants.usda.gov/java/profile?symbol=LOCO6> [Accessed 7 November 2006]

[USGS-NPWR, Northern Prairie Wildlife Research Center. 2006. *Lotus corniculatus*. U.S. Department of the Interior. U.S. Geological Survey](#)

Summary: A brief fact sheet containing a practical description of it characteristics and field marks.

Available from: <http://www.npwr.usgs.gov/resource/plants/floramw/species/lotucorn.htm> [Accessed 8 November 2006]

[Zheng, H., Wu, Y., Ding, J., Binion, D., Fu, W., Reardon, R. 2004. Invasive Plants of Asian Origin Established in the United States and Their Natural Enemies, USDA Forest Service FHTET pp 104-105, Morgantown, West Virginia](#)

Summary: Describes the distribution and habitat of *L. corniculatus* in China.

Available from: <http://www.invasive.org/weeds/asian/lotus.pdf> [Accessed 12 Novemeber 2006]