

SILKY LUPINE

Lupinus sericeus Pursh
Plant Symbol = LUSE4

Contributed by: USDA NRCS Idaho Plant Materials Center



Silky lupine. Photo by Paul Alabak, University of Montana.

Alternate Names

Common Alternate Names: blue-bonnet lupine

Uses

Silky lupine is consumed by white-tailed deer, bighorn sheep, upland game birds, small nongame birds and small mammals. Livestock will utilize the plant but it is poisonous to cattle and sheep. Palatability is rated poor to fair for cattle and horses and fair for sheep (Matthews, 1993). It may be unpalatable to elk (Tracy and McNaughton, 1997). It is rated poor in terms of nutritional value. Silky lupine provides fair to good cover for small mammals and birds. Its ability to fix nitrogen allows it to colonize disturbed, low fertility soils but is rated low to medium for control of soil erosion and for long term revegetation (Matthews, 1993).

Hummingbirds are attracted to silky lupine and the plant is recognized by pollination ecologists as attracting large numbers of native bees. It is an important pollen source for bumble bees and a nectar source for honey bees (Lady Bird Johnson Wildflower Center, Online).

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Weediness

Because of its toxic qualities to domestic livestock, stock growers may consider silky lupine to be a weed where it is prevalent and interferes with livestock grazing.

This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use. Weed information is also available from the PLANTS Web site at <http://plants.usda.gov/>. Please consult the Related Web Sites on the Plant Profile for this species for further information.

Ethnobotany

The Okanagan-Colville tribe of British Columbia used a mixture of strained, pounded seeds mixed with water as an eye medicine. They also used the plant for bedding and floor covering in sweatshops. They used the plant bloom as an indication that groundhogs were fat enough to eat and recognized the plant as being a favorite food of the marmot. The Thompson Indians of British Columbia considered the plant poisonous but thought that horses consumed the plant as a medicine (Native American Ethnobotany Database).

Description

General: Pea Family (Fabaceae). Silky lupine is a native, perennial, tap-rooted, cool season legume. There are usually several solid stems at the base of the plant that are 2-8 mm (0.08-0.31 in) in diameter. Total plant height, including the inflorescence ranges from 4-14 dm (25.75-55.12 in) tall. Leaves are palm-shaped with 5-9 leaflets (finger-like segments). Leaflets are usually densely pubescent on both faces. Flowers are small and spurred forming racemes and are dense in bud, becoming loose during flowering. Racemes are 12-25 cm (4.72-9.84 in) long. Flower petals are either vivid blue with white or yellow white eyespot, pale blue, or whitish with brown

eyespot. The seed pod is somewhat flattened and bears 2-5 seeds (Cronquist and others, 1989; Pratt and others 2002).

The genus *Lupinus* has over 150 species in North and South America and the morphological uniformity of the flower and pod and the lack of genetic barriers to interbreeding contribute to the difficulty of taxonomic classification (Cronquist, 1989). There is much disagreement concerning recognized subspecies of silky lupine (Matthews, 1993). The PLANTS database recognizes three subspecies, ssp. *huffmanii*, ssp. *marianus*, and ssp. *sericeus*. Subspecies *marianus* has leaflets with sparse pubescence to glabrous on the upper surface and is found mostly in southern Utah. Subspecies *sericeus* has leaflets that are uniformly puberulent to pilose on the upper surface and is widely distributed (Welsh, 1978). No published descriptive information on the taxonomy of ssp. *huffmanii* could be found.

Distribution: Silky lupine is found in Manitoba and British Columbia south into Montana, South Dakota, Wyoming, Colorado Arizona, and New Mexico. It is also found in Washington, Oregon, Idaho, Nevada, and Utah. The subspecies *huffmanii* is found in Utah and Arizona and ssp. *marianus* is localized to Utah. The subspecies *sericeus* has the same distribution as *L. sericeus*. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Silky lupine is found in grasslands, sagebrush, mountain brush plant communities and in aspen and coniferous forests (Matthews, 1993). Silky lupine is commonly found in association with sedges (*Carex* spp.), prairie junegrass (*Koeleria cristata*), Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), and bluebunch wheatgrass (*Pseudoroegneria spicata*). It is also found with Gambel oak (*Quercus gambelii*), ninebark (*Physocarpus malvaceus*), serviceberry (*Amelanchier* spp.), mountain mahogany (*Cercocarpus* spp.), arrowleaf balsamroot (*Balsamorhiza sagittata*), and western yarrow (*Achillea millefolium* var. *occidentalis*) (Matthews, 1993).

Adaptation

Silky lupine is adapted to a broad range of soil textures but found most commonly on coarse textured and well drained, non-saline soils. It is found in areas receiving 10-18+ inches (254-457+ mm) of annual precipitation and at elevations ranging from 820 feet (250 m) in the Columbia Basin of Washington to 10,000 feet (3,048 m) in Utah. It prefers full sun but will tolerate partial shade. It grows in soils with pH 7-7.5 (PLANTS Database).

Establishment

In western Montana plant growth begins in early May and flowering occurs in June and July. Seeds disseminate in August (Matthews, 1993).

The seed coat of silky lupine is hard, causing a physical dormancy. The appearance of seedlings after forest fires is indicative of a physical dormancy that is broken by high temperatures (Hosokawa and others, 2004). Monsen and others (2004) report that silky lupine establishes well when dormant seeded on disturbed sites by drilling to a depth of ¼ inch or by broadcasting. Full plant development may be slow with flowering not occurring for 3-5 years.

Management

Sheep are frequently poisoned by feeding on lupine. Signs of poisoned sheep include nervousness, excessive salivation, lethargy, difficulty breathing, convulsions, coma, and death. Poisoning usually occurs when hungry animals are allowed to graze lupine. Cattle grazing lupine between the 40th and 100th days of gestation often give birth to calves with crooked legs and other congenital deformities. Consumed hay containing lupine has also caused death of sheep and cattle. The amount of lupine that will kill an animal varies with the stage of plant growth. Sheep consuming desirable forage may not be affected by occasionally eating a small amount of lupine (0.04 pound per day), but will develop clinical signs of poisoning if the same amount is consumed for 3-4 days. Cattle may be poisoned by consuming 1-12 pounds of lupine without other forage (Panter and others, 2011).

Poisoning can be reduced by keeping hungry animals away from lupines during the early growth stage, in late summer when the plant is in the highly toxic seed stage, and from dense stands at all times. Keeping cows away from lupine during the 40th to 100th days of gestation will prevent most deformities. There is no known treatment for lupine poisoning (Panter and others, 2011).

Pests and Potential Problems

Greenhouse grown plants are susceptible to root rot and fungus attack (Hosokawa and others, 2004). The authors have observed natural stands of silky lupine that have been consumed by Mormon crickets.

Environmental Concerns

Silky lupine is a native plant that may have value for restoration of disturbed areas. However, if livestock grazing is a major use in the area, the toxic effects of the plant to livestock should be taken under consideration when planning plant restoration components or seed mixes.

Control

Silky lupine may be controlled by herbicides. 2,4-D LV ester applied at 2 .0 lb. acid equivalent/acre (ae/ac) at the early bud stage; metsulfuron 0.9 oz ae/ ac applied to actively growing plants; or picloram applied at 0.25-0.5 ae/ac to actively growing plants are recommended (Pacific Northwest Weed Management Handbook). Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read and follow

label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seed and Plant Production

Seeds are collected by hand when seeds are tan to gray colored at maturity. Because seeds dehisce forcefully at maturity, pods are cut from field plants just as they begin to dry and placed into paper bags for transport. Pods are then spread out to dry and covered with a fine mesh cloth. When seeds are mature and dry, material is processed to remove pods and other inert matter. Because of the hard seed coat, seed must be treated to break dormancy. Seed is placed in a brief 5-10 second hot water bath and then immediately transferred to cold water. Once seed is cooled, it is wrapped in moist paper towels and placed into refrigeration at 3°C (36°F) for 30 day stratification. Imbibed seeds should be inoculated with *Rhizobium* specific to lupine. Seed is then placed into growing media and lightly covered. Greenhouse temperatures are maintained at 20-25°C (68-78°F) during the day and 16-18°C (60-66°F) at night. Seeds germinate uniformly in 8 days and time to first true leaf stage is 7-15 days. Length of establishment phase is 12 weeks after which plants should be hardened off and transplanted. Careful attention must be paid to prevent damage to the taproot and it is difficult to transplant. It is best to pre-treat the seed and sow directly on the planting site (Hosokawa and others, 2004).

Reported seed weights for silky lupine range from 12,873 seeds per pound (Hosokawa and others, 2004) to 24,550 seeds per pound (PLANTS database).

There are no published reports of field production of silky lupine seed.

Cultivars, Improved, and Selected Materials (and area of origin)

There are no cultivars, improved, or selected materials of silky lupine. Common wildland collected seed is available from commercial sources (Native Seed Network).

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