

LEAFY SPURGE: Options for control

Leafy spurge (*Euphorbia esula*), a class-B designate noxious weed in Ferry County, Washington of the Euphorbiaceae family, originates from Europe. Leafy spurge grows as clusters of upright stems one to three feet tall. The stems are erect, tough and woody, and frequently have many non-flowering branches. The plant emerges in early spring, producing yellowish-green bracts which appear from early to late May, with the true flower emerging in mid-June. The bracts surround a cluster of 11-20 small, stalked yellow-green flowers. Leaves are dark blue-green, hairless, narrow, and alternate on the stem. Maturing stems change color from pale green in early summer to yellow or red in the fall. Leafy spurge can be distinguished from other plants by the white sap that will ooze from all parts of the plant when cut or broken open. **This milky latex can cause serious skin irritation or blindness, if rubbed in the eyes.** In cattle and horses leafy spurge causes severe irritation of the mouth and digestive system. Gloves are needed when handling leafy spurge.

Leafy spurge can spread by seed and horizontally growing roots, which send up shoots beyond the perimeter of the leafy spurge patch. When seed capsules dry, they literally explode, shooting seeds up to 15 feet. Buried seeds can remain viable for over 15 years. Since typical infestations may have seed banks of 350 to 1,000

seeds **per square foot**, even a decade of repeated control efforts may leave enough seeds for the population to reestablish. Partial injury to root systems, stems, or foliage encourages bud production, and can aid the growth and spread of the plant. In agricultural fields, **tillage aids** leafy spurge by disturbing soil, distributing root fragments, and bringing buried seeds to the surface. Hand cutting, mowing, burning or digging is usually not effective because the entire root system must be excavated for complete control. Even if the foliage of the plant is removed or destroyed, the living root tissue will regenerate new shoots, and the new shoots can emerge from buds located anywhere along the length of the root. Grazing sheep and goats is an effective tool in controlling this plant. Avoid grazing leafy spurge with mature seed (brown to gray in color), as leafy spurge seeds may get caught in animal hooves or hair, or will be carried in feces and deposited in non-infested pastures when the animals are moved. Animals that have grazed on leafy spurge seed should be held on the pasture for at least five days to allow all seed to pass from their systems before moving them.

This perennial noxious weed readily adapts to most environments. It is an economic and environmental catastrophe; it reduces rangeland productivity and plant diversity wherever it gets a foothold.



Leaves are alternate, blueish-green and 1- 4 inches long.

Key identifying traits

- **Perennial**, standing erect, up to 3 ft., several stems branch from base.
- **Flowers** are **very small**, enclosed by yellowish-green paired **heart-shaped** floral leaves.
- **Toxic** white latex sap oozes when cut or broken open.



Yellowish-green petal-like structures called bracts, bear the true flowers.



Leafy spurge roots may grow more than 20 feet deep.

Biology and ecology

- Creeping perennial plant reproduces by **seeds** and **root buds**. **Flowers** in mid June.
- An average **stem** will produce **140 seeds**, which can lie dormant up to **15 years**.
- **Roots** often exceed **20 ft.** in depth.
- **Seed capsules** **explode** when dry, dispersing seeds up to **15 ft.** from the parent plant.
- **Toxic** to cattle and horses.
- Can cause **severe skin blistering** in humans and even cause **blindness** if rubbed in eyes.
- **Found** in a wide range of environments, but has become dominate on rangelands and pastures.
- **Seedlings** typically do not flower during the first year.
- A piece of **root** as small as 0.5 inch long and 0.1 inch diameter will produce new buds.
- **Root** pieces will also survive two to three hours of drying in the hot sun.



Seeds readily float and waterways are good sources for new infestations.



The **dangerous** white milky latex distinguishes leafy spurge from other weeds.



Long term persistence is imperative with this plant.

Photos and references courtesy of: NWCB, written findings, Team ARS, photo, Eleanor Saulys, Colorado State University, IVM Technical Bulletin, nematode.unl.edu.

For this and other publications, see our website at: www.co.lincoln.wa.us/weedboard

CONTROL MEASURES:

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Prevention:

- **Early detection** is vital to prevent invasion.

Biological:

- Some species of flea beetles are capable of *controlling* infestations. *Apthona lacertosa* we are finding works the best, however the results as of yet are not exciting enough to recommend investing in.
- Sheep and goats can be used to help control leafy spurge.

Cultural:

- Healthy competitive vegetation helps prevent

infestation, but doesn't stop it entirely.

Mechanical:

- **Pulling** is **not recommended** because the root system remains undamaged and new sprouts will reappear rapidly. This method actually **increases** the number of plants.
- **Mowing** would have to be done continuously, it **stimulates development** of inflorescences on the lateral branches.

Chemical:

- See chart below.
- Use a surfactant to help with herbicide uptake.
- **Read the label** instructions before applying.

Herbicide	Labeled site*	Rate (per acre)	Application time	Remarks
Tordon 22K	R&P, NC	1.0qt.-repeat annually 3-4 years.	Spring following appearance of true flowers and/or fall re-growth.	Use the 2qt. rate as a spot treatment. Upper rates may cause grass damage.
Tordon 22K	R&P, NC	1pt. + 1qt.	Spring following appearance of true flowers and/or fall re-growth.	1 Treatment per year for 2-4 years should provide good leafy spurge control.
Banvel	R&P, NC	1qt. + 1qt.	Spring following appearance of true flowers and/or fall re-growth.	Two treatments per year for 1-4 years should provide good leafy spurge control.
2,4-DAmine	All	1qt.	Early Spring	Prevents seed formation. Retreatment may be necessary to prevent seed formation.
Overdrive + Tordon	NC, R&P	4.oz + 1 pt	Spring	Results after 1 year, show 90% control. Add methylated seed oil surfactant.

* R & P = Range and Pasture; NC = noncrop; Crop = cropland; F = fallow; All = all of these sites.



- **Sheep** have been used to control leafy spurge for over 50 years. Sheep prefer forbs (flowering plants), such as leafy spurge, over grasses, thus suppressing leafy spurge while allowing competitive grasses to thrive. Sheep require a two-to three-week adjustment period to become accustomed to leafy spurge forage. Once introduced to the forage, leafy spurge can become 50% of the animals diet. If present, other weeds may also be partially controlled by grazing sheep. Sheep stocking rates for one month would be four to eight sheep.

Significant reduction in leafy spurge density requires at least 3 years of continuous or repeated grazing, but complete control will not be achieved. However, a level of control can be reached that will be high enough to contain an infestation and reduce the density of the population. Sheep grazing is especially effective for reducing the size of the seed bank. In one study, 8 years of grazing reduced viable seed density from averages of 325 to 1.4 seeds per square foot. In another study, after 13 years of continuous sheep grazing, leafy spurge infestations

dropped from 60% to 5% of the ranch area. Sheep are a cost-effective addition if leafy spurge infests more than 4% of a ranch, and returns are greater if the leafy spurge is concentrated in a few pastures. There are some limitations in the use of sheep to control leafy spurge. It is not cost effective to move large numbers of sheep a significant distance to graze an infested area. It may not be possible to graze the entire area of very large infestations before seed production occurs. In most cases where sheep are used, the landowner has purchased the animals and incorporated them into the production system, or a neighbor has sheep and is willing to graze them on non-infested pasture. Sheep are more susceptible to predators than cattle, and losses sustained while grazing a neighbors pastures may be unacceptable. Electric or other fencing plus guard dogs or llamas can help protect sheep.

Despite these limitations, sheep grazing remains a very popular and effective means of leafy spurge control in many places. Because of the value of leafy spurge control, federal agencies may not charge a fee for grazing leafy spurge infested federal land, and private land owners may lower rental fees for infested pastures.

- **Goats** are good grazers for leafy spurge control because they selectively graze forbs and shrubs, leaving grass to regenerate former leafy spurge sites. Goats will eat all above-ground portions of the plant. A goats diet will include 14% more leafy spurge and 39% more flowering stems than the diet of a sheep fed on the same pasture. They will eat older, less palatable plants rejected by sheep and may provide better control of well-established infestations. The high protein content of leafy spurge results in very high quality mohair in angora goats.

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