

Leafy Spurge

(*Euphorbia esula*)

Description: Leafy spurge is an aggressive, persistent, deep-rooted perennial, growing to a height of two to three feet or taller. Native to Europe and Asia, it was introduced to the United States in 1827. Leafy spurge now extends from southern Canada through the northern United States, and as far south as Texas. It has been documented in at least sixteen counties in Washington State.

- **Root system:** Leafy spurge roots are brown with pinkish buds. Plants are able to maintain high root reserves through an extensive root system that can extend to depths of nine to twenty-one feet.
- **Stems and leaves:** Stems arise from a woody root crown just below the soil surface. The stems are thickly clustered and bear narrow, 1-4 inch long leaves. Leaves are bluish-green in color, turning yellow or reddish orange in the fall. When damaged, leaves and stems produce a milky latex.
- **Flowers:** Leafy spurge produces a flat-topped cluster of yellowish-green petal-like structures called bracts, which surround the true flowers. The showy yellow bracts appear in late May and early June, giving the plant the appearance of blooming. However, the true flowers, which are small and green, do not develop until mid-June. The distinction between bract appearance and true flowering is important for effective timing of control measures.
- **Fruits and seeds:** Seeds are oblong, gray to purple, and occur in clusters of three. When dry, the seed capsules shatter, throwing seeds up to fifteen feet away from the parent plant. Seeds can remain viable in the soil for at least eight years.
- **Reproduction:** Leafy spurge reproduces by vegetative re-growth from roots and by the production of large quantities of seeds that are often dispersed by birds, wildlife, humans, and in rivers and streams.



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Impacts: Leafy spurge produces a milky latex that is poisonous to some animals and can cause blistering and skin irritation. The digestive tract is similarly affected when it is eaten by humans and animals. In cattle it causes scours and weakness. When ingested in larger amounts it can cause death. For humans who make accidental contact with the milky sap, the consequences range from minor skin irritation to total blindness if the liquid is rubbed on the eyes.

Infestations of leafy spurge have been linked to diminished plant diversity. It can produce up to 3,400 pounds of seed per acre, and in time, can come to dominate a seed bank and pose continued problems regarding efforts to revegetate a site or restore native vegetation.

Although leafy spurge infestations are most severe on undisturbed lands, on cultivated cropland it can reduce crop yields by 10 to 100%. A 1990 study by North Dakota State University estimated the direct annual financial impact in Montana, North Dakota, South Dakota, and Wyoming to be \$40.2 million with secondary impacts at \$89 million and the potential loss of 1,433 jobs annually.

Control Options: Thurston County's Integrated Pest Management emphasizes cultural, biological, and manual control methods to keep pests and vegetation problems low enough to prevent damage. The goal of Thurston County's IPM is to minimize the use of pesticides by utilizing and providing information about the most effective control options that are available and practical.

► Cultural / Habitat

Good pasture management will help to prevent invasion of leafy spurge and other unwanted weeds. Thoroughly clean all vehicles and equipment suspected of carrying seeds or root fragments.

► Biological

Several insect species that are specific to leafy spurge are being used to help control areas of large infestations. Five species of flea beetles are now established in Washington State. These and other bio-control agents, moths, beetles and a gall midge have been released successfully in other states. As with all insect bio-controls, success is limited to reduction of infestations to more manageable levels. Grazing with sheep and goats has also been used successfully in reducing severity of infestations in pastures and rangeland.

► Manual / Mechanical

Pulling leafy spurge by hand is usually ineffective, even for small isolated patches. The depth of the root system and large number of root buds that produce new, individual plants following removal of top growth make hand pulling or digging impractical. However, it may be possible to hand pull a few plants that are in their first year of growth, if follow-up visits are made to ensure new shoots were not produced. Tillage is used on croplands in dryland areas where there are few other options. As a control method, tillage must be timely and intense, repeating every three weeks without interruption. Fall only tillage allows land to be utilized for crops, but has poor lasting success without combining with herbicide treatments.

Be sure to wear protective clothing whenever handling or working near leafy spurge.

► Chemical

Leafy spurge produces new plants from its roots so it's important to use a systemic herbicide such as **glyphosate** that will move into the extensive root system and kill the entire plant. Applications using a hand-held or backpack sprayer with a 5% glyphosate concentration are recommended. Add methylated seed oil to the tank mix to allow the herbicide to penetrate the waxy coating on the leaves and stems. Follow label directions to mix herbicide to the desired concentration and spray the plants until they are wet but not dripping. Treatments should be made in either midsummer or after fall regrowth has begun but before a killing frost. A single application of glyphosate will usually only suppress leafy spurge. Two or three applications per year for two to three years may be necessary for complete control. Currently, products containing the active ingredient glyphosate are the only herbicides for control of leafy spurge that are considered "low in hazard" by Thurston County's pesticide review process.

Thurston County has observed that most ready-to-use, pre-mixed products do not contain sufficient active ingredients to be as effective as concentrated products that are then mixed with water to create a specific finished concentration. The following instructions are for products containing 41% glyphosate which will be mixed down to a specified dilution rate. Be sure to read your label carefully, and make adjustments to rates accordingly.

Products containing the active ingredient **imazapic**, (Plateau®), are considered effective, though "moderate in hazard" due to persistence and mobility, and are the County's second choice for herbicide control. Fall treatments are most effective for this herbicide. Add methylated seed oil to the tank mix to allow the herbicide to penetrate the waxy coating on the leaves and stems. Follow label directions to mix herbicide to the desired concentration and spray the plants until they are wet but not dripping. Imazapic is also non-selective and may damage any plant it comes into contact with.

Timing

Optimum timing depends on the type of herbicide used, and its specific mode of action. Please refer to information on individual herbicides above. For late applications, determine if plants can still be sprayed by cutting a few stems or leaves to see if milky sap flows from the cuts. If it does, plants can still be sprayed.

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS. Obey all label precautions and safety measures. Always use personal protective equipment that includes coveralls, waterproof gloves, shoes plus socks, and protective eyewear. Use of brand names does not connote endorsement and is for reference only; other formulations of the same herbicides may be available under other names. Information provided is current as of the date of the prescription. Pesticide product registration is renewed annually and product names and formulations may vary from year to year.

REFERENCES:

Weeds of the West, 9th Edition, 2001

2009 Pacific Northwest Weed Management Handbook, pg. 490-491. ISBN 978-1-931979-19-1

Leafy Spurge Identification & Chemical Control, W-765 (Revised) June 2006, Rodney G. Lym & Calvin G. Messersmith, NDSU

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10 foot trench showing the length of exposed roots
USDA ARS Archive, USDA Agricultural
Research Service, Bugwood.org



Image courtesy of Dan Sharratt
Oregon Department of Agriculture



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