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LEAFY SPURGE

Leafy spurge, *Euphorbia esula* L., is a tenacious, creeping perennial weed that is classed as noxious in both the Idaho Weed Law and the Idaho Seed Law. It was introduced into the United States in about 1840 and since has spread into the northern tier of states and Canada.

This weed was first found in Idaho in the early 1900's. It is now found in at least 26 counties. Serious infestations exist in Fremont, Clark, Custer, Elmore and Washington counties. Smaller infestations are present in Madison,

Jefferson, Bonneville, Bingham, Caribou, Franklin, Oneida, Camas, Twin Falls, Owyhee, Valley, Latah and Kootenai counties.

Leafy spurge thrives in gravelly mountain soils but it also does well in most other soils of the state. Although it is primarily a serious problem in land which receives limited cultivation, it also is a threat to cultivated lands.

Most spurges contain toxic properties. Leafy spurge contains the alkaloid Euphorbon which is toxic to cattle. It

also gives off a substance which inhibits growth of grasses and other desirable plants in the surrounding soil. Cattle often do not graze readily in spurge-infested areas.

Identification

Leafy spurge plants are recognized by their numerous long, narrow leaves, usually less than 1/4 inch wide and 2 to 3 inches long, by their yellowish cast from mid-summer until fall, and by their thick, white cell sap. In early spring the plants are dark green. They usually appear in patches, but may be scattered in field infestations. They often grow in clusters from a vertical root.

The stems vary from 1 to 3 feet in height, are erect and usually single, branching only toward the top. The long leaves are placed alternately and crowded on the stem. Just below the soil surface the old plant crown has several pinkish scaly buds. The typical milky sap is readily seen by breaking a stem or leaf.

From late May to July, inconspicuous flowers develop on the tips of the short terminal branches. These flowers are not noticed because they don't have petals. More noticeable are the broad, heart-shaped leaves placed opposite each other near the base of the flowers on the flowering branches. These leaves turn yellow as the plant approaches maturity. They are commonly mistaken for yellow flowers. Because of these leaves, the plants and patches of plants have a definite yellow top color from mid-June until cool nights or frosts occur. After frost in the fall, the leafy spurge plant turns an attractive red color.

Each flower produces a 3-chambered capsule with 1 seed in each chamber. The seeds are about 1/10 inch long and



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nearly as wide. They vary in color from gray to brown or slightly purple but are usually basically gray, often flecked with brown or yellow. They resemble a miniature bird egg.

Old plant crowns of leafy spurge are semi-woody. Typically the crown bases are pinkish due to the numerous ever-present, new stem buds. The root system is composed of thick roots which penetrate the soil 8 to 10 feet. Although the stem buds are most conspicuous in the old crown, the buds are numerous on the entire root system.

How Infestations Spread

Leafy spurge spreads by both seeds and roots. Seed spread is dramatic because as the chambers of the seed capsule ripen, unequal pressures develop. This causes the capsule to explode, throwing the seeds as far as 20 feet.

The numerous vegetative buds and the ability of the plant to spread its seed are major factors enabling this weed to spread rapidly once it has a start. When man helps by carrying the seed or by dragging root sections to clean areas of the field, the spread is much faster.

Methods of Control

Cultivation

Cultivation to eradicate a perennial weed is designed to starve the plant to death by cutting it off repeatedly at the point of lowest food reserves in the root system. Killing leafy spurge requires cutting off all top growth every 14 days throughout the growing season. The cultivator must be sharp and designed and operated so as to cut off every shoot at about 4 inches below ground. The final cultivation in the fall is important; failure to cultivate the last growth in the fall enables the plant to restore its root reserves giving it new strength for the following year. A cultivation program will take 2 or 3 years to complete eradication of old plants.

When leafy spurge reaches the early bud to flowering stage, the available food supply in the roots is at a low point. The ability of the plant to regrow is weakest at this time, so this is a good time to start a clean cultivation program. However, it is usually more

MIXING GUIDE FOR CHEMICALS CONTROLLING LEAFY SPURGE

Chemical	Rate (Actual material per acre)	Amount of commercial material to use on		
		100 sq. ft.	1 sq. rod	1 acre
2,4-D 4#/ gal. amine	1 pound	1/2 tsp.	1 tsp	1 qt.
Banvel 4#/gal.	1 pound	1/2 tsp.	1 tsp.	1 qt.
Tordon 22K 2#/ gal.	2 pounds	1-3/4 tsp.	1½ tbsp.	1 gal.

Measures for Spray Applicators

3 teaspoons = 1 tablespoon	1 teaspoon = 5 milliliters
2 tablespoons = 1 fluid oz.	1 tablespoon = 15 milliliters
8 fluid oz. = 1 cup	1 cup = 240 milliliters
2 cups = 1 pint	1 pint = 475 milliliters
2 pints = 1 quart	1 quart = 950 milliliters
4 quarts = 1 gallon	1 gallon = 3800 milliliters

practical to begin a clean cultivation program just following crop harvest.

Since leafy spurge emerges in early spring about the same time as alfalfa, alfalfa is not a satisfactory smother or competitive crop.

Selective Chemicals

Successful control is obtained by cropping with grain or grass and spraying selectively with 2,4-D. Pastures can be sprayed with 2 to 4 pounds of 2,4-D per acre; grain crops with 1 pound of 2,4-D per acre. The timing for spraying with 2,4-D is critical. The spray should be applied when the leafy spurge is in the beginning bud to beginning bloom stage. The weed comes closest to this stage when winter wheat is in the fully tillered to boot stage. This is the safest time to use 2,4-D on wheat.

When well-established forage grasses are infested, spraying 2 or more times a year with 4 pounds of 2,4-D will reduce the spurge stand faster and release the grass to thicken and grow more luxuriantly. Adequate nitrogen applications on the grass will hasten this process. In grass production 3 applications per year of 2,4-D are sometimes possible. For most satisfying results spray in the beginning bud to first bloom stage, again in mid-summer and again in September. The secret to success is selecting a system and staying with it year after year.

Spot Treatments

When a few small patches of leafy spurge are present, apply spot

treatments covering the weed and immediately adjacent areas.

In grass areas, apply 2 pounds per acre of picloram (Tordon) which will kill the spurge plants and allow the grass to grow. Tordon is registered for range and pasture use in Idaho. Treatment should be made in late summer or fall for most effective results. A combination of Tordon and 2,4-D applied as a foliage spray is also effective but will require several treatments for eradication.

Extreme care in using picloram is necessary to avoid damage to susceptible crops. Do not allow livestock grazing on treated areas to have access to fields where susceptible crops such as potatoes, beans, sugar beets, or alfalfa will be grown, until they have been off Tordon-treated areas for at least 72 hours.

For successful control and eventual eradication, newly emerged seedlings must be killed before they establish as perennial plants. Do this with cultivation, 2,4-D or other surface residual herbicides before the seedling is 4 weeks old.

A persistent, continuous program is necessary for economic control of leafy spurge and absolutely essential if eradication in a particular area is to be achieved.

For rates of application of herbicides, read and follow the label