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LEAFY SPURGE

Identification and Control

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LEAFY SPURGE

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Leafy spurge is a tenacious, perennial, noxious weed in Idaho. It was introduced into the United States from Europe about 125 years ago, probably in crop seed. It has spread into Canada and to most northern states. It is a noxious weed in 22 states.

Found in at least 26 Idaho counties, leafy spurge is present in large infestations in Fremont, Clark, Custer, Franklin, Oneida, Valley, Camas, Elmore, Washington and Kootenai counties.

IDENTIFYING THE PLANT

Leafy spurge (*Euphorbia esula* L.) plants are recognized by their numerous long, narrow leaves, usually less than $\frac{1}{4}$ inch wide and 2 to 3 inches long, their yellowish cast from mid-summer until fall, and 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 numerous short terminal branches. These flowers are not noticed because they don't have petals. Attracting attention of the observer 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, and they are commonly mistaken for yellow flowers. Because of these leaves, the plants and patches 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 $\frac{1}{10}$ inch long and nearly as wide. They vary in color from gray to brown or slightly purple. They are usually basically gray and often flecked with brown or yellow and resemble a miniature bird egg.

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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.

Other Properties

The milky sap of leafy spurge contains an alkaloid called Euphorbon. This alkaloid has been credited with causing the death of livestock. Skin irritations can result from both plant consumption and direct contact with animals or man. The plants contain growth inhibitors which when leached into the soil can depress the germination of seeds and the growth of other plants. It is possible that this material can depress the growth rate of competitive crops.

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 distances of 1 to 20 feet.

The numerous buds on the system 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.

Leafy Spurge and Idaho Law

In Idaho leafy spurge is a primary noxious weed as are 17 other creeping perennials. According to the Idaho seed law, seed of primary noxious weeds may not be present in any marketed crop seed.

METHODS OF CONTROLLING THE PLANT

Control by Cultivation

The weed emerges in early spring about the same time as alfalfa. Consequently, alfalfa is not a satisfactory smother or competitive crop. When it reaches the early bud to flowering stage the available carbohydrate supply in the roots has reached a low

point. The recovery ability of the plant is weakest at this time and, therefore, a clean cultivation program can be started advantageously. However, it is usually more practical to begin a clean cultivation program just following harvest or in early spring.

Cultivation is an eradication procedure aimed at starving the plant to death. To kill leafy spurge it is necessary to cut off all the roots every 14 days throughout the growing season. The usual cultivation depth is about 4 inches. Cultivation must continue every 14 days until the infestation is eradicated. This process will take 2 or 3 years. Continued cultivation will completely eradicate this weed if it is done thoroughly and persistently, cutting off all emerged shoots with every cultivation.

Control by Selective Chemicals

Successful control has been obtained by cropping with grass or grain and spraying selectively with 2 pounds of 2,4-D amine per acre. Spraying once each year will reduce the stand about 50 percent per year.

When this chemical treatment is used, it is possible to grow crops of winter wheat, or grasses used for forage or seed and still fight the weed. Winter wheat is preferred over spring wheat because it is in the safest spraying stage when spurge is at the most susceptible stage.

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

Control by Non-Selective Chemicals

When a few small patches of leafy spurge are present the use of chemicals with greater killing power may be preferred.

Applications of 2,4-D, 2,4,5-T, silvex, or amitrole at rates of 4 to 8 pounds per acre should be applied 2 or 3 times during the growing season, depending upon when the regrowth reaches 8 to 12 inches height. There are several other chemicals that can be used for killing leafy spurge which are essentially soil sterilants. Among these, sodium chlorate and the chlorate-borate mixtures have generally been most successful in a wide variety of soil types. All such compounds should be used according to directions on the containers.

Mixing Guide for Chemicals Controlling Leafy Spurge

Chemical	Rate in lb/actual material per acre	Amount of Commercial Material to use on:		
		100 sq ft	1 sq rod	1 acre
2,4-D 4 lb/gal Amine	2 lb	½ tsp.	2 tsp.	2 qt.
	60 lb	12 Tbsp.	2 cups	15 gal
Amitrole	8 lb	3.6 tsp.	4 Tbsp.	16 lb
Sodium Chlorate		2¼ lb	6 lb	

Handy Measures for Spray Applicators

3 Teaspoons	= 1 Tablespoon	1 Teaspoon	= 5 milliliters
2 Tablespoons	= 1 Fluid ounce	1 Tablespoon	= 16 milliliters
8 Fluid ounces	= 1 Cup	1 Cup	= 237 milliliters
Area	10 ft. x 10 ft.	=	100 sq. ft.
	1 sq. rod	=	272 sq. ft.
	1 acre	=	43,560 sq. ft.

Chemical Treatments Applied in the Fall

Soil applications of 30 to 60 pounds of 2,4-D per acre in late October and November have proved to be effective. In some infestations 30 pounds of 2,4-D have reduced the stand over 90 percent. It is important to use the water soluble amine formulation because this will be carried into the root zone by the winter moisture.

Late fall application is essential to avoid the decomposition of the 2,4-D which takes place when temperatures are warm and adequate soil moisture is present. Chemicals should be applied before the ground freezes to avoid run-off. This heavy rate of 2,4-D will not seriously injure grass. Treated areas can be cropped the following year, but it will take more than a year for the soil to return to full production. There are many other new herbicides that can be used in this same way, but all of them are more costly and thus far, none have been equal to 2,4-D in effectiveness when calculated on a cost basis.

GENERAL PRECAUTIONS

Any treatment whether done on cropland or on non-cropland or whether 2,4-D or a soil sterilant, must be followed with additional applications in order to obtain complete eradication. **Persistence is essential to the successful control of any perennial noxious weed.**

When selecting a chemical or other method of treatment consider the possible effectiveness, the cost, the effect on the soil and on the following crops and the possibility of residues in any agricultural product taken from the treated area.

PESTICIDE RESIDUES: These recommendations for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow recommendations carefully with respect to dosage, levels, number of applications, and minimum intervals between applications and harvest.

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