

# The Spurge Spread

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Leafy spurge, *Euphorbia esula*, is a fast spreading, perennial, noxious weed in Montana. An erect plant that grows 1 to 4 feet tall, leafy spurge produces alternate, linear, lanceolate, blueish-green leaves that are 1 to 3 inches long. Yellow-green flowers are above large yellow-green heart-shaped bracts and form an umbel shaped inflorescence. All vegetative material contains a white latex sap.

Leafy spurge is strongly rhizomatous. The vigorous reddish-brown rootstocks with pink vegetative buds can extend 15 to 25 feet deep and spread laterally 1 to 3 feet per year. Translocation of viable seed by streams, birds, wildlife and the hauling of infested hay is a common means of spurge spread.

Leafy spurge was introduced in 1827 to Massachusetts from the Caucus Region of Russia. It spread westward and was first identified in Montana in 1917. There are at least 18 different varieties of leafy spurge throughout the country, and, collectively, 560,000 acres of land in Montana are infested.

This infestation is appalling when one considers that leafy spurge reduces the grazing capacity as much as 75% on the affected areas. The decreased yield in grazable forage is due to the fierce competition of spurge along with the unavailability of some desirable forage intermixed with the spurge.

Projected from this reduction in grazing capacity is the loss of 90,000 animal unit months of grazing annually in Montana. It is estimated that the Montana livestock industry suffers an annual loss of over \$1.5 million due to leafy spurge infested rangeland.

Several methods are being used to control and/or eradicate this plant. These control methods encompass 4 approaches: agronomic, chemical, biological, and prescribed grazing by sheep.

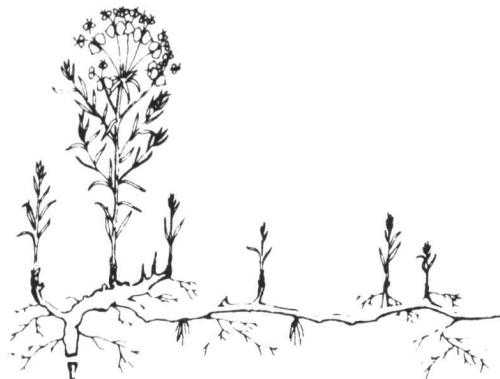
Mowing, burning, and cultivation techniques have been used as agronomic methods of control. Removal of the top growth by clipping has not proven very effective; the root with tremendous food reserves remains intact and the plant continues to regrow. Prescribed burning is also ineffective as seldom are fire temperatures hot enough to destroy all seeds or the rootstocks. In some cases, the fire residue may actually benefit the seedling upon germination as a fertilizer. Cultivation to a depth of 4 inches with a duckfoot plow has proven the most successful agronomic control technique. Cultivation should be applied every 2 to 3 weeks from early spring until fall frost occurs. Application of this technique has eliminated up to 60% of the leafy spurge within 1 year when properly carried out. Failure to follow up with the cultivation treatment, as scheduled, can spread the stand of

leafy spurge with the establishment of new plants from location of portions of rhizomes cut off the old plants.

Chemicals are the most commonly used control method. Dicamba (Banvel), 2,4-D, and Amitrol-T control the top growth and eliminate seed production and are the most economical chemicals. Tordon actively controls both top and root growth of leafy spurge, but may cost up to \$100 an acre per application. Tordon residue may persist in the soil for 3 to 5 years and has a restricted use label in Montana.

Landowners in Montana are spending approximately \$2.5 million annually on chemicals to control leafy spurge on land valued at \$300-\$400 an acre.

In many situations, chemical costs exceed annual land payments. In the last 5 years, chemical cost have doubled.



Recent breakthroughs in developing new types of chemical applicators appear very promising and could save up to 65% on chemicals and their application costs. The roller wiper and wicker contact applicators make it possible to treat infestations close to water without causing pollution problems. The herbi and quick draw applicators and chemical beads are manually operated and are used for treatment of hard-to-get-areas where use of standard spraying equipment is not feasible. These new concepts in applicators have not seen widespread use to date.

Biological control of leafy spurge incorporates the use of insects to selectively feed on leafy spurge to control the plant. This control method is intended to completely replace any of the other control methods, but to complement them and hopefully reduce the amount of chemical control needed. A defoliating moth was released with no success to date. A spurge hawkmoth, released 10 years ago, has reproduced but no information has been released on its success. A stem-mining cerembycid beetle will soon be released for use. Two flea beetles, and a leaf tier, will be placed in field

The author was a delegate representing the International Mountain Section. She was 18 at the time and a freshman at Montana State University.

cases in 1982 for reproduction tests. Scientists are hopeful that the leaf tier can be released for control use by 1984. A small lace bug is being tested in California and other possible leafy spurge control insects are also being studied in Rome, Italy. The various insects that are imported as possible selective biological control on leafy spurge must be thoroughly tested to ensure that their damage is selective to the target species only. The insects also have to be suited to the Montana climate. Testing can take as long as 5 years and is a major factor for the slowness in release of the potential selective biological control insects.

Research using controlled grazing with sheep to repeatedly graze off the top growth shows promise in reducing the competitiveness of leafy spurge within the plant community. Leafy spurge can store up to 3 years' food reserves in its root system. Through the use of sheep, these carbohydrate reserves can be depleted by forcing the plant to constantly produce regrowth foliage during the growing season.

A study conducted by a Montana State University graduate student in 1981, indicated that leafy spurge can make up

at least 50% of the forage consumed by sheep. This study was made with the use of esophageal fistulas on sheep of various ages using rangeland in Central Montana with high, medium, and low levels of leafy spurge infestations. These test groups were compared to a control group placed on 2-4-D sprayed forage. No health problems occurred and the weight gains for the summer were similar for all test and control groups.

Another potential control for leafy spurge is the use of a pathogen, a disease causing organism which is being studied extensively in Maryland. Additional collections of European pathogens will be sent to the United States in the spring of 1983.

The least expensive and best method of control is prevention. The majority of our rangeland is free of leafy spurge and to help prevent further infestations, it is important that everyone learn to identify leafy spurge and keep abreast with the latest control methods.

So everyone BEWARE! Let's help put the lid on the spurge spread.



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