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**VEGETATION MANAGEMENT  
GUIDELINE: LEAFY SPURGE  
(*Euphorbia esula* L.)**

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Leafy spurge (*Euphorbia esula* L.) is a deep-rooted perennial plant that is adapted to a wide range of soil moisture conditions from moist to dry. It is aggressive especially in very dry situations where competition from native species is not intense. Areas most sensitive to leafy spurge infestation include pastures, roadsides, abandoned fields, railroad right-of-ways, disturbed and undisturbed mesic to dry prairies, and possibly open natural communities such as savannas.

Leafy spurge emerges in the early spring when temperatures fluctuate around freezing. At this time seedlings may be deep red or purplish in color. As the temperature rises, the main stem is replaced by rapidly growing adventitious stems and, if the plant is over a year old, flowers may appear as early as May. After 4–6 weeks, each stalk may produce and disperse over 200 seeds with a germination rate of 60–80%. However, in spite of this impressive germination rate, the key reproductive capabilities of leafy spurge remain underground: the root system of the plant is very extensive. Vegetative reproduction from both crown buds and root buds explain not only the

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persistence of this weed, but the difficulties encountered in eradicating it as well. 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.

Leafy spurge is well-established in the central plains of the United States where much time and effort is directed at its control. Most agree that the key to stopping this pest is the ability to destroy its root system. Until a biological control can be found, herbicides appear to be a temporary solution. Picloram (trade name Tordon) is the most effective herbicide being used against leafy spurge on rangelands, but it has not yet been recommended for high-quality natural areas in Illinois.

It is important to recognize leafy spurge as a pest immediately; the initial invading populations must be treated to prevent the plant from spreading any farther. The sooner one attacks leafy spurge—in its first year if possible—the better the chances of controlling it. All of the methods below may need to be repeated annually for 5–10 years.

On natural areas, prescribed burning in conjunction with herbicides may be more effective than either method alone. Burning stimulates vegetative growth, making the plant more vulnerable to herbicides. Plants can be sprayed with 2,4-D in autumn (September) and burned the following spring (April). This should be followed by another 2,4-D treatment in June and a fall burn in October. The process may have to be repeated many times.

For top-growth control, the herbicide 2,4-D amine can be sprayed on the foliage in a 2% solution twice a year. The most effective time to apply the herbicide is mid- to late June when the true flowers (not the bracts) begin to appear. The second spray application should be made in early to mid-September when fall regrowth has begun but before a killing frost occurs.

The nonselective herbicide Roundup (a formulation of glyphosate) sprayed on leafy spurge foliage as a 5% solution will provide 80–90% top-growth control if applied

between mid-August and mid-September. A follow-up treatment with a 2% solution of 2,4-D amine between mid-June and mid-July of the following year is necessary to control seedlings.

Apply the herbicide with a hand-sprayer until the spray coverage is uniform and complete. Do not spray so heavily that herbicide drips off the target species. Roundup is a nonselective herbicide that kills grasses and broadleaf plants. 2,4-D is a selective herbicide that kills broadleaf plants, but not grasses. Try to spray leafy spurge only, and carefully avoid contacting nontarget species. Native nontarget plants must be available to recolonize the site after leafy spurge is controlled. The herbicide should be applied while backing away from treated areas to avoid walking through the wet herbicide. By law, herbicides must be applied according to label instructions and by licensed herbicide applicators or operators when working on public properties.

Mowing or hand-cutting is not completely effective because the root remains undamaged and new sprouts will reappear rapidly. Also, mowing would have to be done continuously because it stimulates development of inflorescences on the lateral branches.

Hand-pulling, digging, or tilling is not effective because the entire root system must be excavated for complete control of leafy spurge. Pulling or digging can rip or cut the root into smaller pieces, leaving portions to resprout. This method could actually increase the number of plants.