Youth Forum

Controlling Leafy Spurge

By Ben Beckman

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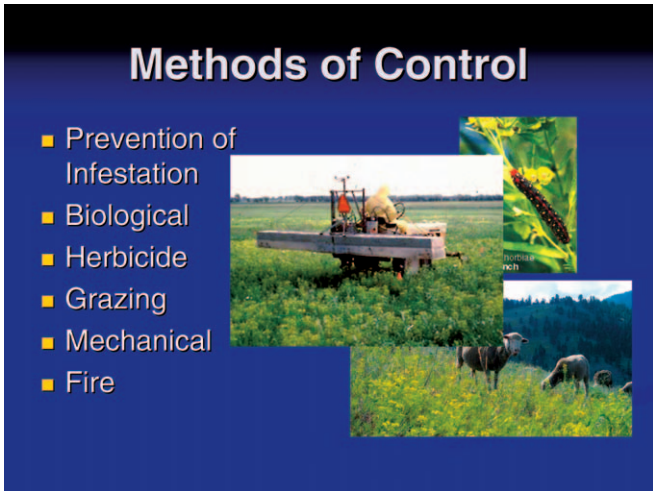
Leafy spurge is one of the most invasive and hard-to-control weeds in ranching today. First introduced from Eurasia in 1827, it is now found in at least 26 states across America. In Nebraska leafy spurge currently infests 285,000 acres in all 93 counties. It can spring up anywhere, but is usually found in pastures and rangeland. This paper will give an introduction to leafy spurge, its reproduction, and delve into some of the different control practices that are being used to control it.

Leafy spurge, or *Euphorbia esula* L., is a perennial forb. It grows 2–3.5 feet tall, and is usually recognized by its bright yellow-green flower brackets, which appear in mid-June. These bracts contain small, similar-colored flowers. The leaves are oblong and drooping, with one main vein. Another distinguishing characteristic of spurge is the milky latex found throughout the plant. This latex can cause a number of problems to cattle that come in contact with it, including blisters, irritation of the mouth, and dermatitis. One of the most remarkable characteristics of spurge is its root system. The plants' roots can extend down 20 feet into the soil providing food storage to help the plant recover after the foliage is destroyed.

Leafy spurge spreads in 3 main ways. The plant's flowers produce large quantities of seed, in fact approximately 130,000 seeds per plant. Mature seeds are projected as far as 15 feet away from the plant from exploding seed capsules. The seed is also particularly hardy, lying dormant for up to 8 years before germinating and starting new plants. Leafy spurge can spread without seeds, through lateral roots. These roots spread out below the surface, acting like rhizomes, producing new plants. Located on the lateral roots are advantageous shoot buds. Wherever one of these buds is found a new plant can spring up. Spurge can also regenerate from severed root sections. Although prolonged disking can destroy spurge stands, one pass may only stimulate growth. The deep root system cannot be totally destroyed, and the chopped-up sections can develop into new plants. This not only fails to destroy the original patch, but invigorates and spreads the patch.

Because of its rapid reproduction, spurge is an invasive opponent. The good news is leafy spurge can be controlled in a number of ways. The best way to control spurge is to prevent it from getting established on your ranch. A strong diverse plant community can prevent spurge from being a problem. However, if leafy spurge does get established there are numerous ways to control it, including biologically (using spurge's natural enemies), herbicide, grazing (with sheep and goats), mechanically (mowing and disking), and using fire. When controlling leafy spurge, the best technique is to use integrated pest management. This involves using 2 or more different control techniques on the spurge. This double whammy controls spurge better than a single control agent could, and may even help kill the plants. This paper discusses the 2 primary control agents used in Antelope and Wheeler counties in Nebraska, biological control agents and herbicide usage.



Biological agents have been used to control spurge in Nebraska since 1988. In Antelope County, Nebraska, where I'm from, the first use of biocontrol came in the 1990s. *Apthona nigriscutis*, a flea beetle, was first released on a sandy site. After several years it was determined that the flea beetle had not been established. However the experimentation of biocontrol continued. Currently 3 types of insects are being used to control leafy spurge.

Apthona lacertosa, or the brown-legged spurge flea beetle, has been used since 1996. They appear to be doing well; however their chance of survival decreases on dry sandy soils. The beetles have been introduced onto 50 sites, and on 4 sites they have been sufficiently established to collect and move insects to new sites. The beetles feed on the spurge roots as larva, and on the foliage as adults.

Because of the flea beetles' poor response on sandy soils, new insects were tried on sandy leafy spurge sites. In 2005 there were 6 releases of *Oberea erythrocephala*. This beetle feeds on spurge as a larva and adult, depleting root reserves and often killing the plant.

There were also 3 releases of *Spurgia esulae*, or spurge tip gall midge. This insect attacks growing shoots, preventing formation of flowers and seed. The effects of *Oberea* and *Spurgia* on leafy spurge are still being observed. To get maximum spurge control, all 3 types of insects are released in the same area.

Spurge can also be controlled by herbicides. There are currently several different types of herbicide that can be used on spurge in a range setting. Two herbicides stand out exceptionally well, Plateau and Grazon P+D. Plateau should be sprayed in the fall 2 weeks before the first frost to get the best effect. It has an application rate of 8–12 ounces per acre, and will cost approximately $17–25 dollars an acre. Grazon P+D is a spring-applied herbicide that should be sprayed when leafy spurge is in its early bud state. It is applied at a rate of 2 quarts per acre, and costs around $15 dollars an acre.

While researching leafy spurge control methods I visited the Dierks ranch in eastern Wheeler County. Mr Dierks has had spurge infestations in several pastures for 25 years. Spurge is virtually impossible to eradicate; however Mr Dierks has made considerable progress in controlling his leafy spurge and its spread. Mr Dierks sprays leafy spurge twice each year, once before it seeds in the spring with 2,4-D and with Plateau in the fall, before the first frost. The spring application of 2,4-D burns back the spurge, preventing flowering and seed formation. The Plateau application in the fall reduces the root system, and can kill the plant. Mr Dierks chooses to use Plateau on his ranch instead of Tordon, because several pastures have high water tables, and several cottonwood trees are located in the pastures. Mr Dierks also isn't concerned about the potential damage Plateau poses to cool-season grasses, because his pastures are mostly warm-season mixtures.

Some of the spurge on the Dierks ranch is in their hay meadow. To prevent the spread of patches Mr Dierks uses a simple technique. He mows around spurge patches. Not only does this prevent spurge-contaminated hay and spreading of seed, but leaves him a nice flag for spraying in the fall.

In order to prevent the spread of leafy spurge to other parts of his ranch, Mr Dierks places all bales made from hay near spurge patches in the same area, away from other bales. These quarantined bales are not sold, and only fed in those

pastures that already exhibit a presence of spurge. This prevents the spread of spurge plants that may have grown up around the unmowed area.

In conclusion, once established, leafy spurge is a formidable opponent. Leafy spurge has cost Nebraska farmers and ranchers around $50 million in control costs and reduced stocking rates. Its vast root system and reproduction make it difficult to control. Quick identification and immediate control action can keep spurge in check and prevent a bigger infestation. The most cost-effective way to control spurge is to use an integrated pest management approach. We reviewed the main characteristics of spurge and its reproduction and delved into the many control techniques. We examined biological control and its history in Antelope County and looked at one rancher's efforts to control spurge on his ranch using herbicides. Spurge has been and will continue to be a problem on ranches across the nation. Vigilance, innovative control techniques, and proper range management will continue to play a deciding role in the effort to control leafy spurge.

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