

Leafy Spurge: We're Not Letting It Grow On Us

RubyAnn Steigelmeier, South Dakota Section

Long ago cattle rustlers and claim jumpers roamed the plains, but now they have been replaced by a different sort of outlaw: noxious weeds. One of the most threatening noxious weeds in South Dakota is leafy spurge, because when left to its own devices, it will crowd out other native plants and lower the cattle carrying capacity of a pasture. According to the South Dakota Department of Agriculture, leafy spurge has infested 317,000 acres in South Dakota as of 2007, and cost landowners \$14 million a year in lost grazing units. We cannot ignore leafy spurge and expect our rangelands to remain biologically diverse and efficient producers of forage for our livestock.

I live on my family's certified organic farm and ranch in north central South Dakota. When we found an acre sized patch of leafy spurge in one of our pastures in 2006, we knew we had to take immediate action to prevent its spread. This paper is about leafy spurge and what we have done to control it on our operation.

First, let's identify leafy spurge. Leafy spurge is a cool season, introduced invasive perennial forb that usually infests pasture and rangelands. Leafy spurge is easily identified by the lime green bracts surrounding the small green flowers and triangular seed pods when the plant is mature. The roots are dark brown and can grow 20 feet deep, with pink buds that rapidly develop into new shoots. The plant also has milky sap which is aversive to cattle, making the entire plant undesirable for cattle forage. Since leafy spurge crowds out other desirable native plants, its presence lowers the cattle carrying capacity of a pasture. Its seed bank is viable for approximately a decade and is impervious to chemicals. One seedling can multiply into a patch 18 feet in diameter in just four years, and once established, its deep, vigorous root system and substantial soil seed bank make it one of the most difficult weeds to control.



Then, what makes leafy spurge a noxious weed? Any weed in South Dakota can be declared noxious statewide that has the following characteristics:

- The weed is perennial.
- The weed is capable of spreading by underground parts and by seed.
- The weed is not controlled by normal management operations and requires special practices.
- The weed is capable of decreasing the value of land and impeding the general welfare of the people of the state.

The most common methods of controlling leafy spurge are chemicals and intensive cultivation, but for our family operation, neither of these were options. We couldn't spray our pasture and

keep it certified organic. We were experiencing a severe drought, and we needed every bit of grass for our cattle, so intensive cultivation wasn't an option either.

Another option for controlling leafy spurge is mowing. This mechanical method destroys the top growth, retarding seed production and causing the plant to use the energy stored in the roots to grow new shoots. If done at regular 2-3 week intervals, mowing will eventually starve the plant. This method can be unsuitable for rangelands depending on accessibility, terrain, and the presence of rocks or other obstacles that can ruin mowing equipment.

Another method for controlling leafy spurge is biological control, also called biocontrol. It reduces the abundance or competitive advantage of a pest through the action of natural enemies. Biocontrol is most often referred to in relation to *Aphthona* species flea beetles and other insects imported for their specific diet of leafy spurge such as tip gall midges. It also includes sheep, goats, and competitive crops. Flea beetles lay their eggs on the soil surface, and once the larvae hatch they burrow down, eating the roots. Tip gall midges lay their eggs near the plant's growth point, and the midge larvae eat their way into the stem and form a gall that retards seed production. Sheep and goats will consume the topgrowth of leafy spurge readily once trained to eat it and have been used very effectively to control this weed. Spurge is high in crude protein, making it good forage for bred and lactating ewes and nannies. My family and I decided to use a combination of approaches to control the leafy spurge in our pasture. We've been mowing the patch down to a 4 inch height to prevent seed production, and try to mow when the plants are beginning to flower, approximately the middle of June. We bought a mixture of five species of flea beetles in 2006 and tip gall midges in 2007 from Integrated Weed Control in Bozeman, Montana and introduced them to our spurge patch.

My siblings and I also bought 50 ewes in October of 2006, and we are now in the process of training them to eat our leafy spurge and Canada thistles, another nasty noxious weed. We are very hopeful our control methods are working. After building sheep-proof fence the summer of 2007, we gave them free choice of the whole 160 acres to see if they would select the spurge. They ate all the leaves off the plants, leaving the stems as brittle brown sticks. The spurge didn't re-grow because it was late in the fall, but we are hoping to see some permanent damage this coming spring.



The flea beetles and mowing have also had an impact, turning the patch into a bunch of yellow, sickly looking plants. We've found that biocontrol is not a quick fix, but it is effective in a long term plan with the right management. Next year we plan to continue our control efforts by grazing our sheep again and releasing more beetles and midges. We're hoping that our sheep will keep the spurge from going to seed, but we'll mow it if we need to.

My family's operation has only a small patch of spurge, but if no control measures are applied, this small patch could potentially take over the entire quarter-section pasture in just a few years.

My family and I are doing our best to control this patch while it is small by mowing and using biocontrol agents including flea beetles, tip gall midges and our sheep. Controlling leafy spurge requires a long-term management plan, but the most important factor is perseverance! Quality pastures are worth all the work you put into them because rangelands are the basis for our ecosystem and economy. We're not giving up.

Bibliography

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