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# An integrated approach to leafy spurge control: Magic, myth, or mess?

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Several control methods are available to develop an integrated leafy spurge control program. The methods include cultural (crop competition), mechanical (tillage, mowing), chemical, biological control (insects, diseases), and a variation of biological control, grazing with sheep and goats.

Integrated leafy spurge control programs are not a new or mythical practice. Craig (1957) proposed "A leafy spurge eradication program" in 1957. This program included chemicals such as atlacide, borax, and 2,4-D at 20 lb/A, intensive cultivation, grazing with sheep, and prevention. Although the integrated approach is not new, some new tools are available to incorporate into the program, such as biocontrol with insects and eventually disease organisms.

Initiation of an integrated program in the best sequence for long-term control is probably important. For instance, should insects such as *Aphthona* spp. be introduced into a leafy spurge infestation first; then after the infestation is reduced, use herbicides to remove surviving plants? Or should the herbicide be used first to weaken the plants thereby allowing the insects to reduce the infestation more rapidly? Does grazing of leafy spurge during the summer followed by a fall-applied herbicide treatment reduce an infestation faster than a spring-applied treatment followed by grazing or fall regrowth? Does grazing by sheep or goats alone reduce the infestation or only allow the use of the land? The answers to these questions remain unknown, but the research programs to answer them are underway.

Good leafy spurge control has been achieved with cultivation combined with chemical (Derscheid *et al.* 1963) and more recently with herbicides applied prior to seeding competitive perennial grasses in rangeland (Ferrell *et al.* 1992). An integrated program also can mean establishing more than one type of insect in a location such as *Aphthona* spp. and the gall midge (*Spurgea esula*) to reduce root vigor and seed production, respectively.

However, leafy spurge control will not automatically become a magical success just because a program is integrated. For example, the combination of a gall fly plus a stem-mining larva on Canada thistle did not or only slightly reduce plant vigor over a 3-year

period (Peschken *et al.* 1992). Also, the combination of a picloram treatment followed by cattle grazing was less successful in controlling diffuse knapweed than the herbicide applied alone (Maxwell *et al.* 1992).

An integrated approach should be designed for the specific land use and location to be successful. The best approach for a Rocky Mountain meadow with wildlife foraging will probably not be the best combination in the Nebraska sandhills that are grazed by cattle. Insistence that one program is best, or only using those pieces that are politically popular will lead to a mess and poor management success.

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