

Reprinted with permission from: 1989 Leafy Spurge Symposium. Bozeman, MT. July 12-13, 1989. pp. 8-11.

Sponsored by: Montana Agricultural Experiment Station, Montana State University, Bozeman, MT.

Sheep management while grazing spurge

RODNEY KOTT

Extension Sheep Specialist, Animal and Range Science Department, Montana State University, Bozeman MT 59717.

Abstract:

Sheep will selectively and extensively utilize leafy spurge, and therefore it can be classed as a forage species under summer use by sheep. Production levels of sheep grazing, primarily leafy spurge, are similar and in many instances exceed those grazing more typical ranges. Although sheep will not eradicate the weed, with a good management system, they will keep it from spreading. The amount of resource inputs that a sheep enterprise will entail is entirely dependent on the type of production desired. If sheep are used to selectively graze leafy spurge, some sort of diet training may be necessary. Sheep seem to respond to good or bad management to a greater extent than other livestock species.

Introduction

The addition of a sheep enterprise to the total ranch program has several advantages other than weed control. Lamb and wool are usually marketed at a different time of the year than calves. Therefore, sheep can improve the monthly cash flow of the total ranching operation. Also, an individual can schedule labor-intensive activities within the sheep enterprise during slack periods and make more efficient use of ranch labor. A third benefit is that, often, by grazing sheep and cattle together, the existing forage can be more efficiently utilized.

The amount of time and effort that a sheep enterprise will entail is entirely dependent on the type of production desired. If sheep are viewed just as a method of weed control and little production is expected, then they will probably require very little extra effort. On the other hand, if the sheep enterprise is viewed as a source of extra income, one must be prepared to make a commitment toward the sheep operation.

Diet selection

Producers have experienced varied results when using sheep to control leafy spurge. This may in part be the result of a preconceived conclusion that it will not work. However, on the other hand, it may have something to do with diet training or imprinting.

Sheep encounter a variety of potential foods on rangelands. One question that has always puzzled researchers is how do they learn what and what not to eat. The genetic relationship between a mother and her young is similar enough that they should respond similarly to cues provided by, and consequences associated with, foods. The mother might also influence food habits of her young by transmitting odors and tastes from foods through her milk (Galef, 1976; Madsen, 1977).

Sheep reared in different habitats often prefer different foods when foraging in the same area (Arnold, 1964; Arnold and Maller, 1977). Arnold and Maller (1977) found that sheep from different environments persistently selected diets of different botanical composition and that diet selection was greatly influenced by previous dietary experiences. Dietary experiences in early life had more effect on later dietary habits than when these experiences occurred at older ages.

Food imprinting, should it exist, is a type of learning that occurs during a sensitive period. Behavior learned during this period persists throughout life (Immelmann, 1975). Should food imprinting occur in livestock, the logical time would be during weaning (Martin, 1984). During weaning the developing animal must make a major transition from complete dependence (Galef, 1981). Young lambs initially learn about foods during this period, and can learn from their dams.

In a study conducted at MSU (Bartz *et al.*, 1985) ewes were placed on pastures containing light (19%), moderate (24%) and heavy (41%) leafy spurge infestations. Diets of ewes grazing leafy spurge-infested pastures indicate that initial consumption of leafy spurge was low for the first one to three weeks of the grazing period. Following this initial period, leafy spurge consumption gradually increased to where it comprised 40 to 50 percent of the sheep's daily dry matter intake.

It was also noted that as the amount of leafy spurge in the diet increased, the consumption of the grass and other forb components decreased. This shift in diet composition is not uncommon. Cook and Harris (1968) found that sheep diets were largely composed of grass in early summer and mostly forbs in late summer because animals tend to prefer greener plant material. The shift in diet composition of sheep in this grazing study may be explained by leafy spurge's ability to provide more succulent, green plant material during later stages of the growing season. In addition, daily observations of sheep grazing leafy spurge-infested pastures indicated all phenological stages of leafy spurge growth were selected, with the inflorescence being selected first in mature plants and the entire top growth being consumed in immature plants.

If learning affects food recognition and ingestion rates, sheep which are reared in an environment free from leafy spurge and then moved to a spurge-infested pasture cannot be expected to selectively graze the spurge plants. If the area does contain an abundant supply of grasses and forbs, which the sheep are familiar with, one would expect at least initially that the sheep would prefer those grasses and forbs. However, if the sheep have

previously been exposed to and consumed leafy spurge they should selective graze the spurge. Food imprinting in theory could also be accomplished by initially placing the sheep in an area where the spurge infestation is fairly extensive forcing some consumption of the spurge. This will force the sheep to relearn what and how to eat (Zimmerman, 1980).

Animal performance

A three-year study (Bartz *et al.*, 1985) examining the value of leafy spurge as a range forage for ewes and lambs indicated that animal performance was equal to or greater than animals grazing grass pastures. In this study researchers reported higher ($P < 0.05$) average daily gains (ADG) in ewes and lambs grazing leafy spurge-infested pastures than those consuming only grass and increased ($P < 0.05$) ADG's in lambs grazing in heavy vs. light leafy spurge-infested pastures. Breeding and lambing was not affected following summer use of leafy spurge-infested pastures.

Leasing concerns

Once the decision is made to use sheep to control leafy spurge an alternative which is often pursued is to lease the spurge-infested area to a sheep producer at a reduced rate. On the surface this may seem like an arrangement that is beneficial to both the landowner and the sheep producer. However, this is not always the case.

The sheep enterprise in most sheep operations is a long-term enterprise and should be managed as such. The number of ewes run should be balanced with the available long-term feed resources. Unless the sheep producers normal range is in poor condition and would benefit from non-use, there would be no economic advantage to lease spurge-infested pasture instead of utilizing his normal summer range. In the case where forest service land is utilized for summer grazing it may be difficult to maintain the permit if it is not utilized for several years. Unless a long-term commitment (5 plus years) on the part of the landowner can be made, leasing quite often may not be economically advantageous to the sheep producer.

Another factor to consider when adding a sheep enterprise in an area that has not traditionally been grazed by sheep is predators. Predators, both coyotes and domestic dogs can be devastating. If a sheep enterprise is to be feasible, predation must be minimized. In some areas predator may be large enough of a problem and effective control not feasible that utilizing that area with sheep is unrealistic. A visit with the local animal damage control officer during the planning stages may be extremely beneficial.

Conclusion

Sheep will selectively and extensively utilize leafy spurge, and therefore this plant can be justifiably classified as a forage species under summer use by sheep. It is recommended that moderate to heavy stocking rates be utilized for the control of this noxious plant species. This is especially true during grazing periods when sheep can be observed utilizing leafy spurge as a principle component of their diet. It should be cautioned that

with this requirement for moderate to heavy stocking rates it may prove difficult to utilize small areas of leafy spurge within large pastures. Where sheep utilize leafy spurge as a forage at the conclusion of the grazing period, sheep should be placed in a holding area for one week to allow for voiding of leafy spurge seed, which may have retained its viability.

Literature cited

- Arnold, G. W. 1964. Some principles in the investigation of selective grazing. *Proc. Aust. Soc. Anim. Prod.* 5:258.
- Arnold, G. W. and R. A. Maller. 1977. Effects of nutritional experience in early and adult life on the performance and dietary habits of sheep. *Appl. Anim. Ethol.* 3:5.
- Bartz, S., B. Landgraf, P. Fay and K. Havstad. 1985. Leafy spurge (*Euphorbia esula*) as a forage component for ewes and lambs. *SID Research Digest*, Vol 1, No. 2:39.
- Cook, C. W. and L. E. Haris. 1968. Nutritional value of seasonal ranges. *Utah State Univ. Exper. Sta. Bull.* 477:55.
- Galef, B. G. Jr. 1976. Social transmission of acquired behavior: a discussion of tradition and social learning in vertebrates. *In*: J. S. Rosenblatt, R. A. Hinde; E. Shaw; C. Beer, eds. *Advances in the study of behavior*. Vol. 6. New York: Academic Press; 77.
- Galef, B. G. Jr. 1981. The ecology of weaning: parasitism and the achievement of independence of altricial mammals. *In*: D. J. Gubernick; P. H. Klopfer, eds. *Parental care in mammals*. New York: Plenum Press; 211.
- Immelmann, K. 1975. Ecological significance of imprinting and early learning. *Annu. Rev. Ecol. Syst.* 6: 15.
- Madsen, F. C. 1977. Flavoring agent transmits feed preference. *Anim. Nutr. Health.* 32: 15.
- Martin, P. 1984. The meaning of weaning. *Anim. Behav.* 32: 1257.