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# Biological control of leafy spurge using angora goats

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## Introduction

Leafy spurge infests over 1 million ha in the Northern Great Plains. North Dakota alone has approximately 0.5 million ha infested. Land value depreciation in North Dakota is estimated at \$137 million, while foregone business activity is estimated at \$75 million (Thompson *et al.* 1990).

Herbicides have been the traditional choice for controlling leafy spurge, however, long term control has been elusive with any method. Due to herbicides ineffectiveness, sensitivity of use in fragile or sensitive habitats, and potential for groundwater contamination, biological control measures are being studied. These include various species of insects, pathogens, sheep, and goats. Sheep and goats will graze leafy spurge, which has a nutritional composition approaching alfalfa (Fox *et al.* 1991).

This research project was initiated in 1991 on the Sheyenne National Grasslands in southeastern North Dakota. The Grasslands are managed for multiple use including cattle grazing by the U.S. Forest Service. Extremely large infestations of leafy spurge occur in several areas within the Grasslands, limiting their usefulness for cattle, wildlife, and recreation.

The primary objective of this project was to determine annual changes in leafy spurge and associated plant communities following repeated goat grazings. We will also examine the nutritional and botanical composition of diets selected by the goats.

## Methods

Five 8m<sup>2</sup> exclosures were established, each containing four perpendicular transects. Grazed outside transects are compared with nongrazed inside transects using measure-

ments of density, cover, and yield for leafy spurge, native forbs, shrubs, and grasses along with leafy spurge height.

Goat diets were collected following a video tape evaluation and analyzed for nutrient composition. Fecal collections were also made at the same time as the diets were collected. These underwent microhistological analysis for botanical composition and relative preference analyses. This is of major interest to cattlemen and Forest Service officials.

## Results

Only data for 1991 has been analyzed and summarized. Herded angora goats readily grazed leafy spurge throughout the growing season. Leafy spurge cover was reduced from 34% to 15% through goat grazing. Goat grazing prevented leafy spurge from flowering and producing seed.

Nutritive quality of diets generally declined over the grazing season. Percentage dietary crude protein declined from 20% to 16% between June and September. Percentage phosphorus in diets declined from .45% to .38% from start to finish of the grazing season. Diet digestibility declined from 78% to 70% between early and late season collections. Crude protein and phosphorus percentages of diets exceeded nutrient requirements of angora goats throughout the grazing season.

## Literature cited

- Thompson, F., F. L. Leistritz, and J.A. Leitch. 1990. [Economic impact of leafy spurge in North Dakota](#). Agri. Econ. Rep. No. 257, North Dakota State Agric. Exp. Sta., Fargo.
- Fox, D., D. Kirby, R. G. Lym, J. Caton, and K. Krabbenhoft. 1991. [Chemical composition of leafy spurge and alfalfa](#). North Dakota Farm Research 48(6):7-9.