ROTATIONAL FORWARD GRAZING OF SHEEP ON IMPROVED PASTURES

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In 1978, a three-year study was initiated to quantify the inherent differences in three sheep-grazing systems in western Oregon: (1) continuous grazing, (2) four-paddock rotational grazing, and (3) four-paddock rotational grazing with early weaning of the lambs--called rotational forward grazing. In the rotational grazing systems, sheep were moved from one paddock to the next every five days. Lambs in the rotational forward grazing system were weaned at approximately 14 weeks of age and placed in the paddock ahead of their dams. Then, lambs in the rotational forward grazing system always were rotated one paddock ahead of the ewes.

The grazing trials were conducted on 18 acres of gently rolling, improved pasture approximately three miles northwest of Corvallis. The average annual precipitation is just under 40 inches. Canopy cover in the early spring of 1980 was 31.9 percent tall fescue, 16.4 percent perennial ryegrass, 1.6 percent other perennial grasses, 16.3 percent annual grasses, 6.2 percent subclover, 6.8 percent other forbs, and 5.1 percent moss.

EXPERIMENTAL PROCEDURE

The study was laid out as a randomized block design with three blocks and three treatments. This made a total of nine experimental pastures--three pastures for each of the three grazing systems. As a first step in evaluating these grazing systems, we kept the stocking rate identical across all the pastures. In the 1978 grazing season and for the first five weeks of the 1980 grazing season, the stocking rate was 4 ewes and their 6 lambs per acre. Because of poor forage growing conditions in 1979 and for the duration of the 1980 grazing season, the stocking rate was reduced to 2 ewes and their twin lambs per acre. Animals were weighed and pasture data collected every 15 days on an offset schedule during the winter-through-summer grazing season.

RESULTS AND DISCUSSION

The single most important finding during the course of this study was that the rotationally grazed pastures produced considerably more forage than the continuously grazed pastures (Table 1). The rotationally grazed pastures had 17 percent more forage available to livestock than the continuously grazed pastures.

Table 1. Treatment averages for three grazing systems

	Continuous Grazing	Rotational Grazing	Rotational Forward Grazing
Forage on offer to livestock (season total), lbs/acre*	4,720	5,120	5,969
Peak lamb weights, lbs*	66.6	69.4	64.8
Final ewe weights, lbs*	130.1	133.2	137.7
Percent ground cover, June 29, 1980	87.2	91.5	93.7
Moss canopy cover, March 27, 1980	8.7	3.5	3.0
Bull thistles, plants per acre, July 21, 1980	3,350	1,696	1,739
Percent crude protein, season-long 1980 average	9.5	9.0	8.2

* Three-year average, 1978 through 1980.

Although stocking rate (number of sheep per acre) was kept the same across all the pastures, forage production and, therefore, stocking intensity (sheep per ton of forage produced) varied as a result of the grazing treatments. Sheep in the continuously grazed systems were forced to overgraze their pastures somewhat, whereas, the sheep in the rotationally grazed systems undergrazed their pastures. This situation is reflected in animal liveweights. At peak weight, lambs in the rotationally grazed pastures were 4 percent heavier than their counterparts in the continuously grazed pastures. We saw problems with the grazing strategy of weaning lambs early in the rotational forward grazing system. Although these lambs had ample high quality forage available (this was the rationale for this system--to allow the lambs first opportunity at the preferred forage before the ewes had access) they never made up for initial setbacks in weight gain from early weaning. At peak weight, the rotationally forward grazing lambs tended to be the lightest of any of the lambs on the project, averaging 6.5 percent lighter than the rotationally grazing lambs. This situation was reversed for the rotationally forward grazing ewes. Undoubtedly benefiting from the early weaning of their lambs and the abundance of forage available on their pastures, the rotationally forward grazing ewes were 6 percent heavier than the continuously grazed ewes. Wool weights averaged a little less than 6 pounds per ewe on a yearly basis and did not vary appreciably between the grazing treatments.

As indicated, the continuously grazed pastures showed signs of overgrazing. The sheep grazed these pastures very close to the ground which significantly reduced ground cover (6 percent) in June 1980 as compared to the rotationally grazed pastures. Moss took advantage of the exposed soil on continuously grazed pastures, averaging 8.7 percent canopy cover as opposed to 3.3 percent canopy cover on the rotationally grazed pastures in March 1980. Bull thistles also tended to be a greater problem on the continuously grazed pastures. In 1980, these weeds averaged more than 1,600 more plants per acre on the continuously grazed pastures than on the rotationally grazed pastures.

The greater stocking pressure on the continuously grazed pastures forced the forage plants to be in a constant state of regrowth and, therefore, the forage-on-offer was of higher quality than that available on the rotationally grazed pastures. In 1980, forage in the continuously grazed pastures averaged 10 percent greater crude protein values than forage in the rotationally grazed pastures. Higher quality of forage on continuously grazed pastures probably compensated somewhat for the lower quantity of forage on these pastures.

This experiment has demonstrated the ability of rotational grazing to dramatically increase forage production. Clearly rotational grazing has excellent potential for increasing stocking rates during the growing season. Instead of the fairly modest increase per animal that we found in this study for the rotational grazing system, if the stocking rate were increased to properly utilize the extra forage produced, one should expect substantial increases of animal products per acre.