ROTATIONAL GRAZING FOR FARM FLOCKS

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The production and efficient utilization of forage are important components of many farm flock operations. Much information on how to increase forage production has been accumulated over the last 50 years, but about how to increase forage production, much less information is available concerning how to most efficiently convert this forage into saleable animal products. Unfortunately, the conversion of forage into animal products is a complex process involving numerous plant as well as animal factors. Through grazing management, we attempt to reconcile the needs of the pasture with those of the grazing animal in such a way that we optimize the productivity of both. Over the years, many grazing management systems have been proposed. One of these, rotational grazing, has proven useful as an alternative to continuous grazing in Australia, New Zealand, Ireland, and Rhodesia, as well as in the United States.

In rotational grazing, animals are periodically moved from one paddock to the next during the grazing season. An individual paddock is grazed several times during the season with a period of non-use between grazing periods. The resulting pattern of pasture utilization is designed to reduce animal selectivity by forcing the animals to consume most of the forage produced in a paddock before they are moved to a fresh paddock. Rotational grazing has been credited with increasing pasture production, increasing livestock productivity, and maintaining high condition of native range.

Livestock performance under rotational grazing, however, is only superior to continuous grazing where stocking rates are moderate to heavy. When feed is plentiful, an animal's genetic potential limits its productivity. Thus, pasture management and forage production have little impact on individual animal performance. Under moderate to heavy stocking rates, however, forage availability tends to limit animal production, and grazing management becomes important.

A study was initiated in 1978 to compare continuous grazing (CG) with two types of rotational grazing systems, 1) rotational grazing (RG) and 2) rotational forward grazing (RFG). Although this study was conducted in western Oregon, the basic reactions of the pastures and the animals to rotational grazing systems are believed to apply to meadows in eastern Oregon as well. This belief is on upon considerable experience both in the United States and overseas, indicating that the principles of rotational grazing are applicable to a wide range of pasture types and grazing animals.

EXPERIMENTAL PROCEDURE

Nine, 2-acre improved pastures in the foothills of the coastal mountain range, approximately two miles northwest of Corvallis, Oregon, were divided into three blocks of three pastures each based on their estimated forage

productivity. Species composition of the pasture in 1978 was 30 percent annual grasses, and 9 percent other forbs. All pastures were grazed from the spring through summer (approximately March through August) each year. The stocking rate in 1978 was four ewes and their lambs per acre. In 1979, mortality of pasture plants, especially clover, during an exceptionally cold winter lowered the total forage production. Therefore, the 1979 stocking rate was lowered to two ewes and their lambs per acre in keeping with the lower amount of forage available.

One pasture in each block was assigned to each of three grazing management systems. Under continuous grazing, sheep had season-long access to their entire pasture. Each rotational pasture (RG and RFG) was subdivided into four paddocks. Animals were sequentially moved from one paddock to the next every five days. This resulted in intensive grazing of RG paddocks for five days followed by a 15-day non-use period before the paddock was grazed again. Rotational forward grazing (RFG) was practiced by weaning the lambs at 10 to 12 weeks of age and placing them one paddock ahead of the ewes in the rotational pattern.

RESULTS AND DISCUSSION

Forage production in 1978 for the continuously grazed pastures was 5,502 pounds per acre compared to 6,020 pounds per acre for rotationally grazed pastures (average of RG and RFG). However, 1979 forage production was much lower, 2,857 and 3,375 pounds per acre for the continuously grazed and the rotationally grazed pastures, respectively. In both years, rotational grazing increased forage production by approximately 517 pounds per acre over that achieved under continuous grazing.

Sheep liveweight data for 1978 and 1979 are shown in Table 1. Although no dramatic differences in peak liveweights of ewes or lambs were evident in 1978, there was a tendency for RFG ewes to benefit from the early weaning of their lambs. As the grazing season progressed in 1979, however, RFG ewes in Blocks 1 and 3 (the low forage-producing blocks) performed consistently better than the CG ewes. Peak ewe liveweights in these pastures were 13 percent greater under RFG than under CG systems. Similarily, as the grazing season progressed in 1979, the RG lambs performed consistently better than CG lambs in Blocks 1 and 3. Peak lamb liveweights in these pastures were 25 percent under RG than under CG systems. However, no consistent benefit was noted for RFG lambs over either CG or RG lambs.

The above observations indicate that when forage production is high relative to forage demand by livestock, as occurred in all pastures during 1978 and in Block 2 pastures in 1979, grazing management systems have little impact upon individual animal performance. In this experiment, ample forage was available regardless of the management system and the observed increase in forage production under rotational grazing systems was largely unused by the sheep. However, when forage production does not exceed demand, such as occurred in Block 1 and 3 pastures in 1979, grazing management can be used effectively to influence animal performance. In these pastures, there was a marked improvement in the liveweight gains of the RFG ewes together with

both the RG ewes and the RG lambs over their CG contemporaries. The average 517 pounds per acre increase in forage available in the rotationally grazed pastures (RG and RFG) undoubtedly benefited these ewes and their lambs. Cessation of the nutritional demands of lactation by early weaning of their lambs was a further advantage for the RFG ewes. However, the RFG lambs did not fare as well as the RG lambs, perhaps because of the social stress involved in early weaning. It is possible that with a longer, green feed period than was available on this study site, or with earlier lambing, the RFG lambs may show compensatory gains which would allow them to equal or outperform their RG counterparts. Another management alternative which has not been examined in this study is to wean lambs early and then move them to another pasture of exceptional quality such as alfalfa or irrigated pasture.

Table 1. Peak ewe and lamb liveweights (pounds) under Continuous Grazing (CG), Rotational Grazing (RG), and Rotational Forward Grazing (RFG)

	Grazing Management System					
	CG		RR		RFG	
	Ewe	Lamb	Ewe	Lamb	Ewe	Lamb
1978						
Block 1	133.6	76.6	134.7	77.0	136.5	75.9
Block 2	143.3	77.4	140.2	77.6	152.4	77.8
Block 3	135.2	71.4	134.9	75.6	134.5	70.6
1979						
Block 1	125.5	54.9	142.4	67.7	142.9	53.1
Block 2	137.8	60.6	130.1	57.1	136.9	55.1
Block 3	113.1	45.4	123.5	57.6	128.1	58.2