BUFFER GRAZING FOR A TWELVE MONTH COW-CALF PRODUCTION SYSTEM

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ABSTRACT

Set stocking is a widely used grazing management for beef cow-calf production on Appalachian hill land pastures of the USA. A replicated study was conducted to compare a conventional (set stocking) and buffer grazing management. For the buffer system, grazing area was restricted in the spring and hay was harvested from the ungrazed area. In summer, a portion of this area (buffer) was grazed and a second cutting of hay removed from the remaining area. For the conventional treatment a fixed area was set stocked and hay was harvested on an area designated for hay only. Land areas and fertilizer (N) inputs were similar for both systems. The buffer management produced ($P < 0.05$) greater calf gain/ha (52 kg) due to an increased stocking rate and produced enough hay to supply 95% of winter feed needs, compared to 85% for the conventional system. An economic evaluation favored the buffer system with a $72.50/ha greater return.

KEYWORDS

Cow-calf, set stocking, pasture, *Poa pratensis*

INTRODUCTION

Appalachian hill land pastures produce about 2/3 of their DM accumulation during the first 1/3 of the season. The common animal management practice is to set stock pastures at rates adjusted to the low herbage growth in mid-summer. This results in the accumulation of ungrazed, largely senescent patches with reduced production and lower quality (Blaser et al. 1969). By harvesting a hay cutting in the spring and opening this area to summer grazing (buffer grazing) a producer can use some of the rapidly growing spring forage for winter feed production, and expand the grazing area in the summer months when forage growth is depressed. The objective of this study was to compare cow-calf production on a system incorporating a buffer grazing area with a conventional set stocked grazing system.

MATERIALS AND METHODS

From 1989 to 1991 two replicated grazing systems were compared in northern West Virginia. Each system consisted of 5.1 ha in block one and 4.7 ha in block two. Both systems were designed to provide 12 months of feed as pasture and hay. The conventional system on block one maintained five crossbred (*Bos taurus* L.) cow-calf units, with 3.0 ha of land as pasture and 1.7 ha for two hay cuttings. On block two this system maintained six cow-calf units and consisted of 3.0 ha of pasture and 2.1 ha of hay. The buffer system for block one consisted of 2.1 ha of permanent pasture, 1.5 of a buffer area (one hay cutting and grazing) and 1.1 ha of hay only. It was stocked with six cow-calf units. For block two the areas were, 2.0 ha of pasture, 1.5 ha of buffer and 1.6 ha of hay; stocked with seven cow-calf units. Stocking rates and ratio of buffer to permanent pasture were selected, based on preliminary data, at levels high enough for animal performance to be sensitive to forage availability. Predominant forage species for the pasture and buffer areas were Kentucky bluegrass (*Poa pratensis* L.) and white clover (*Trifolium repens* L.) while the hay fields were orchardgrass (*Dactylis glomerata* L.) and red clover (*Trifolium pratense* L.). Cows and calves were weighed at the initiation of grazing (1st week in May), opening of the buffer area to grazing (late-June) and at weaning (1st week in October). Each year a total of 227 kg of nitrogen was applied to the hayfields of the conventional system and the buffer and hayfields of the buffer system. The study was analyzed as a randomized complete block design. A partial budgeting technique was used to compare the costs and returns of the systems.

RESULTS AND DISCUSSION

There was no difference ($P > 0.10$) between treatments in calf or cow weights at any time. This was as expected based on the stocking rates selected. Weight of the cows and calves at weaning for the conventional system were 555 and 239 kg and for the buffer system 550 and 236 kg, respectively. The influence of production system on gain/ha, based on the total areas, is reported in Table 1. Because of the higher stocking rate, calf gain/ha on pasture was 26 kg greater ($P < 0.05$) for the buffer system compared to the conventional. Total calf production for the buffer system was 317 kg/ha, almost 20% greater, than for the conventional system.

Hay produced, averaged over three years, is reported in Table 2. Drought conditions in the third year of the study depressed yield of 1st cutting hay, and no harvest of 2nd cutting hay was made for that year. Based on NRC (1984) estimates, a 550 kg beef cow, in the appropriate reproductive and lactation stages, winter fed for 195 days, would require 2200 kg of hay (DM basis). If ten percent more is allowed for wastage neither system produced enough winter feed. However, the conventional system produced an average of 1860 kg hay/cow, which was 85% of the requirement, while the buffer system produced 2100 kg/cow (95% of requirement). The buffer system not only produced more calf gain/ha but also came closer to meeting the winter feed requirements of the cows.

Budgeting techniques, which included the additional costs for fencing, labor, and maintaining an extra cow-calf unit for the buffer system, indicated a $72.50/ha greater return for the buffer as opposed to the conventional system.

Buffer grazing increased production and economic returns. Based on animal responses and hay yields more herbage was harvested from the buffer system as opposed to the conventional system. During the third year of study, when drought conditions existed, the superiority of the buffer system was exaggerated because only one hay cutting was harvested. However, this area of the USA occasionally suffers from drought in mid-summer. For the years previous to the drought the buffer system also produced more hay/cow than the conventional system in addition to carrying more animals during the grazing season. A major deterrent for widespread application of buffer grazing to Appalachian hill lands is topographical. Land available for hay production may limit the carrying capacity of a farm rather than pasture land.

REFERENCES

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Table 1
Influence of management on gain/ha for the grazing season and total system.

System	Stocking rate[2]	Pasture gain[1]		Calf production total system
		Calf gain	Cow gain	
	Units/ha	kg/ha		
Conventional	1.13	165	22	265
		*[3]	NS[3]	*[3]
Buffer	1.34	191	34	317

[1]Weight at weaning - weight at initiation of grazing.
[2]Cow-calf units for total system areas.
[3]NS = non significant (P > 0.10), * = P < 0.05 level of significance.

Table 2
Influence of management system on hay production from hay and buffer area.

System	Hay production			
	1st cutting	2nd cutting	Buffer[1]	Total
	kg/system			
Conventional	6840	3370		10210
Buffer	5110	2610	5920	13040

[1]One cutting of hay.