K-STATE Research and Extension

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Evaluation of Grazing Options During Summer for Growing Heifers – Year 3

J.K. Farney, K. Rash,[1] N. Collins,[1] E. Black,[2] and H. Gillespie[1]

Summary

Developing methods to provide high quality forage through most of the year is important for cattle operations. The purpose of this study was to determine forage management options to offset the summer "slump" with fescue. Three grass pasture treatments (8 pastures total; 4 acres each) were used in a completely randomized design and stocked with growing heifers (n = 32; initial weight 559 ± 20 lb). Pasture treatments consisted of crabgrass (CRAB), bermudagrass (BERM), and sorghum-sudan interseeded into novel fescue (SS-FES). Novel fescue is fescue variety that has endophyte organism but does not produce toxin. Heifers were weighed and grazed pastures from May to October (150 d). All other pastures were rotationally grazed with two paddocks for CRAB and BERM and 3 paddocks for SS-FES. Sorghum-sudan was interseeded into fescue pastures in late May and June. Average daily gain (ADG) for the entire grazing period was not different between pasture systems. Bermudagrass pastures produced the greatest average biomass. Crabgrass pastures produced one of the lowest biomass early in the grazing period, then one of the highest at the end of grazing period. Biomass production results for the SS-FES pastures were very low, except for July when the sorghum-sudan had the greatest forage production.

Introduction

Fescue is a cool-season hardy grass that can withstand intensive grazing. Approximately 60% of the annual forage production occurs from March-May. Then fescue has a "slump" during the summer when production is stopped, the plant goes into the reproductive phase, and animal performance can be negatively impacted. In an ideal production system, high quality forage needs to be provided to cattle year-round to maximize overall production. One method to offset the "summer slump" with fescue is for producers to have designated warm-season pastures and cool-season pastures and rotate cattle between the two during their respective growing seasons. However, that requires using at least double the acreage or reducing the cow herd by half. Another opportunity to improve fescue forage quality during the summer would be an addition of warm-season perennials such as clovers. Biomass production increase may be small, even though forage quality is improved. Therefore, producers are interested in adding warm-season annual grasses that produce substantial biomass into cool-season perennial pastures to maximize land usage.

[1] Undergraduate intern, Department of Animal Science, College of Agriculture, Kansas State University; [2] Undergraduate intern, Department of Animal Science, College of Agriculture, Oklahoma State University.

The purpose of this study was to evaluate different grazing options for summer for growing replacement heifers.

Experimental Procedures

Eight, 4-acre pastures were used in this study. Study consisted of three pastures of crabgrass (CRAB), three pastures of bermudagrass (BERM), two pastures of Max-Q fescue (SS-FES) that were drilled with sorghum-sudan. Heifers were stocked on the SS-FES pastures with 4 head per pasture from April to July and they rotationally grazed the pasture in 3 paddocks. Heifers on SS-FES were grazed for 14 days on each paddock to try to keep the swath height close to 2 inches. At the end of May, the paddock that was just grazed was also mowed to a 2-inch height, and 25 lb/acre of sorghum-sudan was drilled into the standing fescue. Then 14 days later when heifers were removed from paddock 2, the paddock was swathed to 2 inches and drilled with sorghum-sudan. After sorghum-sudan was interseeded, 46 lb N/acre of fertilizer was applied. Once the sorghum-sudan was 2 feet tall, 4 heifers were rotated to the paddock and allowed to graze for 10 days before being rotated to the next paddock. Heifers on the BERM pastures were stocked at 4 head per pasture and rotationally grazed between 2 paddocks with 28 days between rotations. The BERM pastures were fertilized with 50 lb N/acre in mid-April. Heifers on the CRAB were stocked at 4 head per pasture and rotationally grazed between 2 paddocks with 28 days of grazing per paddock. Five pounds of crabgrass seed was broadcast onto the pastures in April and fertilized with 50 lb N/acre. The CRAB and BERM pastures were also fertilized with 50 lb N/acre in mid-June.

Heifers were weighed going to pasture after a 3-day rumen equivalence diet consisting of 50:50 blend of DDG:wheat middlings at 2% of body weight and weighed on two consecutive days. Heifers were placed on pasture on May 3, 2023. All heifers were weighed on June 27, 2023, and October 4, 2023.

Pastures were clipped before heifers were placed into paddocks and then at the end of the grazing period for each rotation. Forage mass was measured from these clippings and the measurements represent the available forage.

Heifers' average daily gain, total gain, and gain per acre (gain per acre = heifer gain since grazed for 1 heifer per acre) were determined for each grazing period. Average forage mass was calculated by month.

Results and Discussion

The summer of 2023 was very dry and so forage production was limited, primarily in the SS-FES pastures. Rotational grazing of bermudagrass and crabgrass pastures appeared to support moderate growth for the heifers during this summer. Overall, there was no difference in heifer gains for 2023.

Bermudagrass pasture overall averaged greater available forage ($P = 0.02$) as compared to crabgrass and sorghum-sudan interseeded into fescue. This advantage began in May when bermudagrass pastures had the greatest biomass and this advantage continued through June (Figure 1). However, in July, when all the paddocks had sorghum-sudan growing in the fescue pastures, that treatment had a drastic increase in biomass. Even with that increase in biomass, it did not produce more than bermudagrass or crab-

grass pastures at that time. From August through October, the sorghum-sudan-fescue pastures had a lower biomass than bermudagrass, with crabgrass being intermediate (Figure 1). Crabgrass pastures started with a low biomass, but by the end of the grazing period had as much production as bermudagrass. Even though statistically, there was no differences in ADG based on these different grasses, the available forage almost matched the performance measured when the low biomass and slow growth of crabgrass had the numerically lowest gains from May through June. Then when the crabgrass pastures grew rapidly and produced more tonnage, the heifers grazing crabgrass had the highest numerical gains.

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Table 1. Gains for cattle based on type of pasture

	Treatments				
Item	**BERM**	**CRAB**	**SS-FES**	**SEM**	***P* - value**
Initial weight (May), lbs	558	559	561	20	0.99
June 27 weight, lbs	594	559	626	38	0.47
Gain/acre May-June, lbs	36	0.38	64	32	0.41
ADG, May-June, lbs/d	0.69	0.01	1.20	0.58	0.41
October weight, lbs	737	722	731	23.2	0.89
Gain/acre July-October, lbs	143	163	106	32	0.52
ADG July-October, lbs/d	1.47	1.68	1.09	0.35	0.52
Total gain for summer, lbs	179	163	170	12.1	0.61
Total ADG for summer, lbs/d	1.19	1.09	1.13	0.07	0.61
Average forage mass, lb DM/acre	5392[a]	4379[b]	3610[b]	294	0.02

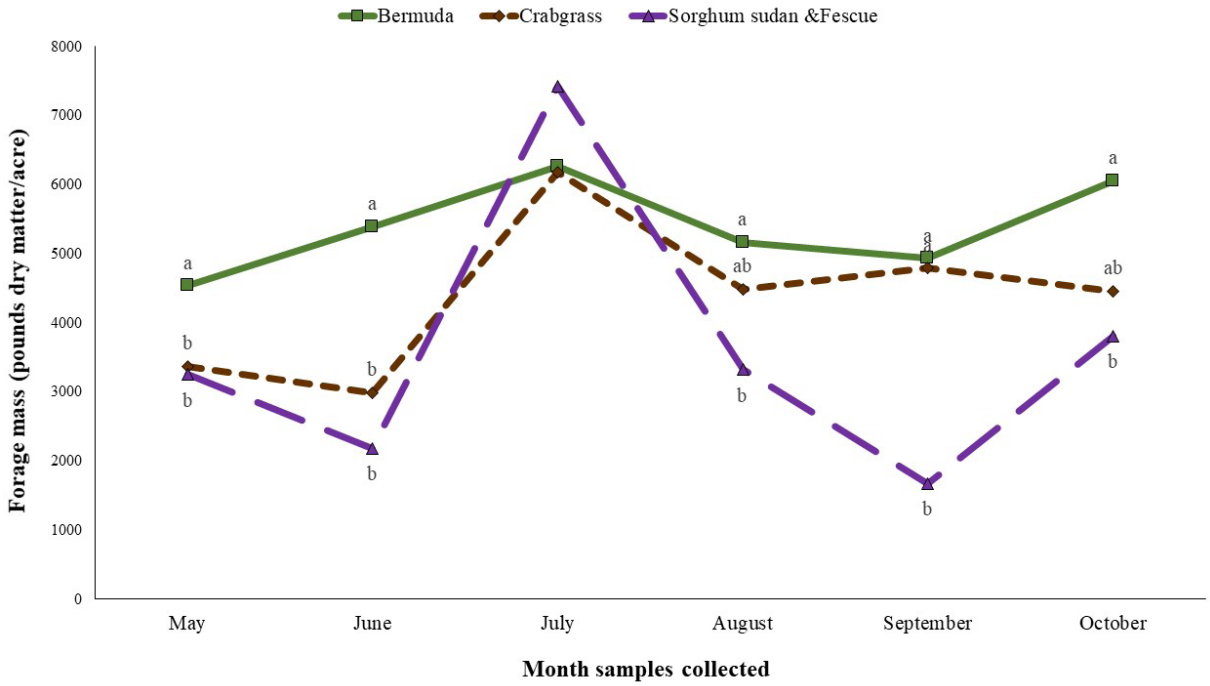

Figure 1. Forage mass by month for each grass type (in pounds dry matter per acre).
[ab] Within month, different letters between treatments indicate differences at $P < 0.05$.
Bermuda: bermudagrass pastures rotationally grazed in 2 paddocks every 28 days. Represented in solid (green) line with square markers.
Crabgrass: Big and Quick crabgrass that was newly seeded and volunteer from previous years. Represented in short dashed (brown) line with diamond markers.
Sorghum sudan & fescue: sorghum sudan was drilled into standing novel fescue (fescue with endophyte but does not produce toxins) pastures in mid-June. Represented as long dashed (purple) line with triangle markers.