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Effects on Cows, Calves, and Vegetation of Nitrogen¹ Fertilization and Burning Bluestem Pastures Annually

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Summary

Burning and fertilizing pastures were evaluated on six Bluestem pastures by comparing performances by spring-calving cows and calves. Two control pastures were not burned or fertilized, two pastures were burned, and two were burned and fertilized with 40 pounds of nitrogen an acre applied aerially. Average daily gains of the calves did not differ significantly among treatments. The burned, fertilized, pastures produced significantly higher gains per acre, as their increased forage supported heavier stocking rates.

Introduction

Number of cows has been increasing in the Flint Hills region and the trend is expected to continue with favorable feeder calf prices and fewer feeders grazed during summers. The increase has stimulated interest in more efficient range use. Weed control and fertilization have long been used to increase row crop production. Until recently little had been done to duplicate crop work with Bluestem range. We evaluated burning and fertilization as ways to increase the productivity of native grasses.

Experimental Procedure

Seventy-two Polled Hereford cows were assigned to three pasture treatments in the fall of 1971 with removal and replacements of cows that were unsound or failed to calf for two years. In the winter of 1972-73, the cows were supplemented with a ration of 53% milo, 30% wheat, 10% dehydrated alfalfa, and 7% soybean oil meal at 3-lb/hd/day from November 15 to January 31 and 5-lb/hd/day from February 1 to April 15. Calving was from February 18 through April 27. Polled Hereford bulls (1 per pasture) were placed in each pasture from May 24 to August 1, 1973.

All pasture treatments were the same as the previous year. April 24, four of the pastures were burned and two were not. May 2 ammonium nitrate (34% nitrogen) was applied aerially at 40 lbs. of nitrogen per acre. The year-around stocking rates were 5.6 acres per cow-calf on fertilized pastures, and 8 acres per cow-calf on burned and control pastures. Stocking rates, the same as the previous year, had been calculated from previous plot studies on herbage production under similar treatments.

¹The following cooperated in making this study possible: Farmland Industries, Inc., Kansas City, MO; U. S. Steel Agri-Chemical Div., Kansas City, MO; and Bob's Flying Service, Waverly, KS.

The cows and calves were gathered and weighed the first week of every month, after being penned without feed and water over night. The calves from one pasture for each treatment had access to creep feed 30 days before weaning. Calves were weighed, graded, and weaned September 20.

Results and Discussion

Neither burning, nor burning and fertilizing combined, significantly affected average daily gain of calves (table 4.1). Pounds of beef produced per acre were significantly increased by burning and fertilizing through heavier stocking rates, not increased daily gains. Cow production factors did not differ significantly among treatments.

Table 4.1. Effects on Cows and Calves of Burning and Fertilizing Native Bluestem Pastures-1972-73

	Control		Burned		Burned and Fertilized	
	1 ¹	2	3 ¹	4	5 ¹	6
Pasture number	1 ¹	2	3 ¹	4	5 ¹	6
Acres in pasture	64	104	104	84	84	84
Cows per pasture	8	12	12	10	15	15
Acres per cow	8	8.5	8.5	8.4	5.6	5.6
Avg. wt. of cows 4 years or older						
Oct. 1, 1973, that weaned calves ²	1206	1023	1131	1054	1078	1079
Avg. calving date	4-14	3-15	3-18	3-13	3-21	3-11
No. of cows open	1	0	0	0	1	0
No. of calves born alive	6	12	11	8	15	15
No. of calves dead before weaning	1	1	2	2	2	1
Avg. wt. of calves born alive	80	77	77	76	79	77
% of cows 4 years and older weaning calves ²	75	91	83	91	85	87
Avg. weaning wt.	423 ¹	420	402 ¹	413	413 ¹	405
Adjusted weaning wt.	508 ¹	453	444 ¹	436	476 ¹	445
Pounds weaned per acre	48	59	40	39	68	69

¹ Calves in pastures 1, 3, and 5 creep fed mixture of 60% dehydrated alfalfa and 40% ground milo last 30 days.

² Some two-year-old cows were added to some pastures to replace unsound cows in 1973.