

# Kansas Agricultural Experiment Station Research Reports

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Volume 0  
Issue 1 *Cattleman's Day (1993-2014)*

Article 1442

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1969

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### Recommended Citation

Smith, E.F.; Owensby, Clenton E.; Swanson, B.W.; and McKendrick, J.D. (1969) "Different methods of managing bluestem pastures," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2845>

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## Different methods of managing bluestem pastures

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Different Methods of Managing Bluestem Pastures  
(Project 253), 1968

E.F. Smith, C.E. Owensby, R.W. Swanson,  
and J.D. McKendrick

This experiment was to determine the effect of increased early summer stocking and burning on cattle performance, productivity of pastures and range condition as determined by plant population changes.

Early stocking at twice the normal rate for the first half the growing season was tried hoping for more gain per acre and cattle ready for dry lot finishing at mid-summer. If grass recovers the last half of the season, it could be "mined" the first half when highest in nutritive value.

Previous tests had shown that late spring burning increases summer weight gains and is compatible with good pasture management.

Present burning treatments are to determine how often a pasture must be burned to achieve good results; annually, every third year or only when conditions favor burning, as when moisture conditions are good and excessive dry grass has accumulated.

Pastures used in this study were between an old research project and a new one. Since all the pastures were used in previous research, their past history is used to help explain some of the results obtained.

Pasture 1 was continued under its same treatment (moderate stocking), pastures 2 and 9 were not used. Pasture 3 had been lightly stocked previously. Pastures 4, 5, and 6 had been in a deferred rotation grazing scheme. Pasture 10 was previously burned annually at mid-spring. Pasture 11 was continued, as for several years, on annual late spring burning.

The experimental treatment for each pasture in 1968 follows (unless otherwise stated, the grazing season was May 1 to October 4; if a pasture was burned, it was in late spring):

Pasture 1 - Moderate stocking

Pasture 3 - Double early stocking, May 1 to July 16.

Pasture 4 - Moderate stocking

Pasture 5 - Burned periodically, when soil moisture was ample and a residue of old grass accumulated, burned in 1968.

Pasture 6 - Burned every third year, burned in 1967 (not in 1968).

Pasture 10 - Double early stocking, May 1, to July 16.

Pasture 11 - Burned annually

Yearling Hereford steers were purchased as calves in October, 1967, near Medicine Lodge, Kansas, and were fed alfalfa hay during that winter. May 2 they were randomly allotted to treatments and weighed individually after being gathered and held overnight without feed or water. Each steer was implanted with .15 mg of diethylstilbestrol.

Pastures 5 and 11 were burned April 25, 1968, under a 5 to 8 MPH wind. Only about 35 percent of pasture 11 burned and about 50 percent of pasture 5; grass was too sparse to carry the fire.

### Results

The results are reported in tables 13, 14 and 15.

Annual and periodic burning improved weight gain over not burning.

Last year the periodically burned pasture was not burned and performance was the same as under not burning.

Pasture 6, which is burned every three years (last burned in 1967), was not burned this year; no improvement over non-burning was obtained. Last year when this pasture was burned, weight gain improved 13%. Although there may be some carryover effect from burning, results to date indicate that the response to burning is greatest the year a pasture is burned.

Double stocking early only produced about the same steer gain per acre and the same daily rate of gain as under moderate stocking for the entire season.

Table 13

Per Acre Production and Disappearance of Forage, Weeds and Mulch  
(Air-dry). Donaldson Pastures Near Manhattan, 1968  
Clippings Taken at Close of Growing Season

Pasture no.	1	3	4	5	6	10	11
	Under cages lb/A (air-dry)						
	(Estimated pounds per acre produced)						
Ordinary upland range site							
Forages	3619	5196	5392	4405	4522	4438	4262
Weeds	529	418	247	355	258	520	663
Mulch	1923	2114	1877	392	685	1211	-
Limestone breaks range site							
Forages	2092	2619	5531	2762	3421	3416	2888
Weeds	863	161	883	128	106	266	260
Mulch	1132	1628	2401	176	581	1110	-
	Disappearance						
	(Estimated pounds per acre grazed)						
Ordinary upland							
Forages	1877	2048	2828	3238	1854	2249	2381
Weeds	383	269	114	196	158	456	484
Mulch	782	286	454	170	546	390	-
Limestone breaks							
Forages	681	703	2451	892	868	1524	1097
Weeds	542	48	731	33	42	121	205
Mulch	-	-	747	-	-	11	-
	Remainder						
	(Estimated pounds per acre remaining at end of season)						
Ordinary upland							
Forages	1742	3147	2564	1174	2667	2189	1881
Weeds	145	150	132	158	99	64	178
Mulch	1141	1828	1423	222	1231	821	-
Limestone breaks							
Forages	1418	1916	3079	1870	2553	1892	1791
Weeds	321	112	152	95	64	145	55
Mulch	1328	1716	1654	242	639	1099	-

Table 14

Grass Increasers and Decreasers As Percentage of Total 1968  
Vegetation, and an Estimated Range Condition<sup>1</sup>  
Based on Percentage of "Original" Vegetation

Pasture no.	1	3	4	5	6	10	11
Ordinary upland, range site							
	Percentages						
Decreasers	37.0	40.7	45.5	46.0	43.9	62.1	60.7
Increasers	43.2	46.2	41.0	35.3	40.1	19.5	27.8
Range condition <sup>1</sup>	56.3	62.2	66.9	65.3	63.9	81.4	78.0
Limestone breaks, range site							
Decreasers	50.8	44.2	65.2	64.2	72.6	57.4	74.7
Increasers	29.2	43.3	24.0	23.2	19.9	31.1	22.7
Range condition <sup>1</sup>	79.0	76.5	93.2	93.1	93.7	85.7	93.0

<sup>1</sup> 0-25% indicates poor condition; 25-50%, fair; 50-75%, good; 75-100%, excellent.

Table 15

Different Methods of Managing Bluestem Pastures  
Compared by Weight Gains of Steers 1968.

	<u>Grazed May 1 - Oct. 4, 157 days</u>					<u>Grazed May 1 - July 16, 76 days</u>	
	<u>Moderate Stocking rate</u>					<u>Double early stocking</u>	
	<u>Not burned</u>		<u>Burned</u>			<u>Not burned</u>	
			Period- ically <sup>1</sup>	Every 3rd yr. <sup>2</sup>	Annually		
Pasture number	1	4	5	6	11	3	10
Number of steers per pasture	20	20	20	20	15	40	30
Acres per pasture	60	60	60	60	44	60	44
Acres per steer	3	3	3	3	3	1.5	1.5
Initial wt. per steer, lbs.	452	458	460	443	460	456	479
Gain per steer, lbs.	251	252	306	259	308	114	139
Daily gain per steer, lbs.	1.60 <sup>3</sup>	1.60 <sup>3</sup>	1.95	1.65	1.96	1.50	1.83
Gain per acre, lbs.	84	84	102	86	105	76	95

<sup>1</sup> Burned in 1968

<sup>2</sup> Burned in 1967

<sup>3</sup> Daily gain in pounds to July 16 for pasture 1, 1.50; pasture 4, 1.79.