

Different Methods of Managing Bluestem Pasture 1965 (Projects 253 3-5).

E. F. Smith, K. L. Anderson and C. V. DeGeer

This experiment was to determine the effect of different stocking rates, of deferred grazing, and of pasture burning on cattle performance, productivity of pastures, and range condition as determined by plant population changes. In addition to the yearly report, a summary of cattle gains for the past 16 years is included.

Experimental Procedure

Yearling Hereford steers with an average U.S.D.A. feeder grade of choice were used in 1965. They were purchased in the spring of 1965 near Larned, Kansas, where they had been grazed on wheat pasture and fed silage and limited grain the previous winter. They were assigned to pastures on a random basis.

The experimental treatment for each pasture was:

Pasture 1 - Moderate stocking rate, 3.3 acres per steer.

Pasture 2 - Overstocked, 2.3 acres per steer.

Pasture 3 - Understocked, 4.6 acres per steer.

Pastures 4, 5, 6 - Deferred grazing and burning, moderate stocking rate, 3.3 acres per steer. The steers were grazed on pastures 5 and 6 from April 29 to July 8. They were then moved to pasture 4 where they remained until September 1, when they grazed all three pastures until September 28, close of the trial. Deferred pasture 4 was burned May 3.

Pasture 9 - Burned April 7, 1965, moderate rate of stocking.

Pasture 10 - Burned April 7, 1965, moderate rate of stocking.

Pasture 11 - Burned May 3, 1965, moderate rate of stocking.

Pasture 9 was to have been burned about two weeks before pasture 10 was, but wet weather and/or high winds precluded burning.

The steers were gathered in the afternoon, held overnight without feed or water and weighed at 8 a.m. Starting and final weights were obtained after putting all steers together and weighing them in random order.

Observations

Results are reported in tables 3, 4, 5; 6. Gain per steer under the various treatments ranged from 178 to 258 pounds. The burning treatments produced the largest gain per steer and deferred grazing, the least gain.

About 75% of pastures 9 and 10 had enough cover to carry a fire when they were burned, with the soil moist and a 10 to 20 mph wind. Most of pastures 4 and 11 burned, with a wind velocity of 5 to 10 mph.

Plant counts made annually during the growing season and clippings were taken after the close of the grazing season to measure plant population and herbage yields. The clippings are taken as paired samples, one of each pair is caged the entire season to measure production and the other is clipped from a nearby grazed area.

Table 3

Grass increasers and grass decreaseers shown as percentage of total 1965 vegetation and an estimated range condition based on the percentage of "original" vegetation.¹

Range Site	Pasture no.							
	1	2	3	4	5 & 6	9	10	11
	%	%	%	%	%	%	%	%
OU ²								
Decreasers	38	22	32	45	46	36	54	66
Increasers	45	52	41	33	36	33	29	20
Range condition	58	41	53	67	61	53	72	84
LB ³								
Decreasers	42	29	43	62	64	49	61	71
Increasers	31	48	41	27	26	25	21	20
Range condition	74	62	70	93	93	77	91	94

1. Forbs limited to 5% in this estimate; all above that considered not original. All values based on plant census data.

2. OU - ordinary upland range site.

3. LB - limestone break range site.

Table 4

Per acre production and disappearance of forage, weeds, and mulch, Donaldson pastures near Manhattan, 1965. Yields obtained from replicated clippings at close of growing season.

Range site	Pasture number								
	1	2	3	Average of 4 5 & 6		9	10	11	
number per acre as indicated									
<u>Production</u>									
OU ¹	Forage	3053	2489	4136	3507	4496	2841	3562	3744
	Weeds	416	648	410	273	320	496	555	192
	Mulch	1002	469	1385	485	656	---	---	---
LB ²	Forage	2365	2390	3278	2319	3392	2229	3149	3097
	Weeds	485	454	200	108	252	557	240	73
	Mulch	1291	515	2806	284	433	---	---	---
<u>Disappearance (Index of amount grazed)</u>									
OU	Forage	773	1692	1066	1604	1436	1040	1231	1597
	Weeds	189	410	137	214	182	297	368	70
	Mulch	---	137	---	2	55	---	---	---
LB	Forage	960	1590	---	498	762	380	1095	985
	Weeds	163	148	81	66	146	300	48	---
	Mulch	161	112	53	---	100	---	---	---
<u>Remainder (Residue at end of season)</u>									
OU	Forage	2280	797	3070	1903	3060	1801	2331	2147
	Weeds	227	238	273	59	138	199	187	122
	Mulch	1002	332	1385	483	601	---	---	---
LB	Forage	1405	800	3278	1821	2630	1879	2054	2112
	Weeds	322	306	63	42	106	257	192	73
	Mulch	1130	403	2753	284	333	---	---	---

1. OU - ordinary upland range site.
2. LB - limestone breaks range site.

Table 5

A comparison of different methods of managing bluestem pastures, April 29, 1965, to September 28, 1965 - 153 days.

Pasture no.	1	2	3	4,5,6	9	10	11
Management	Moderately stocked	Over-stocked	Under-stocked	Deferred and late apring burned	Early-spring burned	Mid-spring burned	Late-spring burned
Number of steers per pasture	18	26	13	54	13	13	13
Acres per pasture	60	60	60	3-60 ¹	44	44	44
Acres per steer	3.3	2.3	4.6	3.3	3.4	3.4	3.4
Initial wt. per steer, lb.	508	509	518	514	504	516	511
Gain per steer, lb.	218	207	204	178	236	231	258
Daily gain per steer, lb.	1.42	1.35	1.33	1.16	1.54	1.51	1.69
Gain per acre, lb.	65.76	90.00	44.34	53.94	69.41	67.94	75.88

1. Three 60 acre pastures.

Table 6

Yearly account of summer gains (pounds per steer) under different methods of grazing pastures; 16-year summary, 1950-1965, the summer season of approximately 150 days.

Pasture no.	1	2	3	4,5,6	9	10	11
Management	Moderately stocked	Over-stocked	Under-stocked	Deferred rotated	Early-spring burned	Mid-spring burned	Late-spring burned
1950	221	210	214	205	216	254	230
1951	242	256	290	234	243	265	254
1952	246	209	228	197	251	278	283
1953	226	194	233	197	205	217	234
1954	261	237	236	214	270	271	306
1955	270	224	253	213	282	305	307
1956	179	184	168	154	212	234	216
1957	243	236	244	209	261	256	279
1958	208	207	207	198	222	270	253
1959	252	241	262	203	254	275	295
1960	267	242	255	235	299	289	314
1961	255	217	227	187	243	245	237
1962	232	177	215	167	201	205	212
1963	202	180	195	170 ¹	187	200	233
1964	214	196	196	209 ¹	225	231	218
1965	218	207	204	178 ¹	236	231	258
Average	234	214	227	198	238	252	258

1. The deferred pasture of these three pastures was burned in late spring in 1963, 1964 and 1965.