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

E. F. Smith, K. L. Anderson, C. E. Owensby and M. C. Hall

Studied are effects of different stocking rates, deferred grazing, and pasture burning on cattle performance, productivity of pastures, and range condition as determined by plant population changes. Included here are report and summary of cattle gains for the past 17 years.

Experimental Procedure

Yearling Hereford steers with an average U.S.D.A. feeder grade of choice were used in 1966. They were purchased in the spring near Cimarron, Kansas, where they had been grazed on wheat pasture and fed silage and limited grain. 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, 2.4 acres per steer.
Pasture 3 - Understock, 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 4 and 6 April 30 to July 2. They were then moved to pasture 5 where they remained until September 1. Then they grazed all three pastures until October 1, close of the trial. Deferred pasture 5 was burned April 29.
Pasture 9 - Burned March 21, 1966, moderate rate of stocking.
Pasture 10 - Burned April 15, 1966, moderate rate of stocking.
Pasture 11 - Burned April 29, 1966, moderate rate of stocking.

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. Each steer was implanted with 30 mg. of stilbestrol.

Observations

Results are reported in tables 18, 19, 20, and 21. Gain per steer under the various treatments ranged from 168 to 300 pounds. The burning treatments produced most gain per steer and overstocking the least gain. Total precipitation for the year was 15.5 inches, about half the average.

It was very dry for the early spring burning and the wind was 5 to 10 m.p.h. About 90 percent of the pasture burned, more than had burned for several years. The ground was moist and a 5 to 10 m.p.h. wind was blowing when the mid-spring burned pasture was burned, about 90% of it burned. Practically all of pasture 5 and 11 burned on the late spring burning date, April 29.

Table 18

A Comparison of Different Methods of Managing Bluestem Pastures, April 30, 1966, to October 1, 1966 - 154 days

Pasture no.	1	2	3	4,5,6	9	10	11
Management	Moderately stocked	Over-stocked	Under-stocked	Deferred and late spring burned	Early-spring	Mid-spring	Late-spring
Number of steers per pasture	18	25	13	54	13	13	13
Acres per pasture	60	60	60	3-60[1]	44	44	44
Acres per steer	3.3	2.4	4.6	3.3	3.4	3.4	3.4
Initial wt. per steer, lb.	522	518	533	520	513	510	523
Gain per steer, lb.	214	168	200	185	271	300	271
Daily gain per steer, lb.	1.39	1.09	1.30	1.20	1.76	1.95	1.76
Gain per acre, lb.	64.2	70.0	43.3	45.5	80.1	88.6	80.1

1. Three 60-acre pastures.

Table 19

Yearly Account of Summer Gains (Pounds per Steer) Under Different Methods of Grazing Pastures; 17-year Summary, 1950-66, 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
Year							
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[1]	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
1966	214	168	200	185[1]	271	300	271
Average	233	211	225	197[1]	240	255	259

1. The deferred pasture of these three pastures was burned in late spring in 1963, 1964, 1965, and 1966.

Table 20

Per Acre Production and Disappearance in Pounds of Forage, Weeds, and Mulch, Donaldson Pastures Near Manhattan, 1966. Yields Obtained From Replicated Clippings at Close of Growing Season.

Pasture no.	1	2	3	4,5,6	9	10	11
Production (lbs. per acre)							
Ordinary upland, range site							
Forage	3559	1291	3493	2581	1350	2130	1738
Weeds	73	381	108	107	281	161	57
Mulch	892	667	1491	551	----	----	----
Limestone breaks, range site							
Forage	2328	1767	3196	2195	1090	1311	1377
Weeds	198	244	104	71	178	139	48
Mulch	1070	531	1537	723	----	----	----
Disappearance (Index of amount grazed, lbs. per acre)							
Ordinary upland, range site							
Forage	1824	892	1123	1299	830	1348	828
Weeds	24	176	40	58	123	93	13
Mulch	----	183	302	----	----	----	----
Limestone breaks, range site							
Forage	806	1126	615	838	660	286	504
Weeds	73	79	29	21	----	104	18
Mulch	271	11	242	111	----	----	----
Remainder (Residue at end of season, lbs. per acre)							
Ordinary upland, range site							
Forage	1735	399	2370	1282	520	782	910
Weeds	49	205	68	49	157	68	44
Mulch	892	484	1189	551	----	----	----
Limestone breaks, range site							
Forage	1522	641	258	1357	430	1025	873
Weeds	125	165	75	50	178	35	30
Mulch	799	520	1295	612	----	----	----

Table 21
Range Condition[1] of Pastures

Pasture no.	1	2	3	4	5	6	9	10	11
	Percent 1								
Range condition (ordinary upland range site)	73.1	51.3	61.1	68.0	89.9	71.9	59.8	86.7	88.0
Range condition (limestone breaks range site)	86.5	67.5	87.3	83.8	88.8	95.9	80.0	97.6	96.9

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