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Progress Report of Grazing Experiments; 1945-1953

Southeast Oklahoma

Pasture Fertility Research Station,

Coalgate.

Departments

of

Agronomy and Animal Husbandry

Agricultural Experiment Station
DIVISION OF AGRICULTURE
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SUMMARY

This publication reports results of grazing trials at the Southeast Oklahoma Pasture Fertility Station near Coalgate, Oklahoma, for the period 1945 through 1953.

Bermuda Grass-Legume Pastures

Pastures of common bermuda grass with legumes were established on four land types receiving various soil treatments. Annual production of beef per acre, as an average of the eight-year period, was:

On upland prairie soil---

Unfertilized, 66 pounds.
Limed, 93 pounds.
Lime and low rates of 0-20-0, 126 pounds.

On a claypan prairie soil receiving lime and a low rate of 0-20-0 --- 122 pounds.

On an alluvial bottomland soil---

Limed, 159 pounds.
Lime and low rates of 0-20-0, 219 pounds.

On a permeable shallow upland soil --- 99 pounds (seven-year average, 1947 through 1953). Limed, and low rate of 0-14-7 fertilizer.

Hop clovers have been the dominant legumes in all pastures at this station. White and Ladino clovers are also present in large amounts in the bottomland pastures during most years. More lespedeza has persisted in the pastures on low fertility upland soil than in the pastures with higher fertility levels. The latter support abundant growth of hop clovers.

Gains per head have not been outstanding for yearling and long two-year-old cattle. Three-year-old cattle have made good gains per head in months of April, May and June. All animal gains are highest in late spring and early summer during most years. Daily gain per head is reduced considerably in late summer and fall, with some weight loss usually occurring in October.

Weeping Lovegrass-Legume Pastures

Two weeping lovegrass-legume pastures were established on a shallow upland soil. Annual production of beef per acre, as an average of the six-year

period 1947 through 1952, were:

Unfertilized, 54 pounds.
Lime and low rates of 0-14-7 fertilizer, 109 pounds.

Improved vs. Unimproved Native Pasture

An overgrazed 300-acre area of native grass was divided into two 150-acre pastures of similar soil types. One was given no treatment. The other was improved by various treatments. During the four-year period 1949 through 1952, the unimproved area produced an annual average of 14 calves from 16 cows with average weaning weights of 391 pounds. An improved pasture of equal area and similar land types produced an average of 21.8 calves from 26 cows weighing 421.5 pounds at weaning during that period.

In 1953, yearling cattle grazed on the unimproved pasture at one animal per 5 acres gained an average of 269 pounds per head, producing 53.9 pounds of beef per acre. On the improved pasture, the same aged cattle with 3.5 acres per animal gained 257 pounds per head, producing 68.4 pounds of beef per acre.

Progress Report of Grazing Experiments

SOUTHEAST OKLAHOMA PASTURE FERTILITY RESEARCH STATION: COALGATE

1945-1953

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The Problem:

Southeastern Oklahoma is well adapted to production of pasture and forage crops by virtue of climatic conditions. Rainfall and temperatures are generally favorable for growth of adapted forage species during most seasons. Soils in this area are generally acid in reaction, very deficient in phosphorus, often low in available potassium. Because of the low fertility and abuse in cultivation, most soils in this area have low levels of soil organic matter.

Much of the land previously used for cultivated crops in this area has been abandoned, primarily because the low soil fertility level will not produce cash crops profitably. Improvement of pastures in this area is dependent on the fertility level of the soil. The principal objective of the Southeast Oklahoma Pasture Fertility Experiment Station is to find practical means of improving soil fertility levels on various land types for adapted grasses and legumes.

The Experiment Station:

The experiment station is located 6 miles northeast of Coalgate in the central part of Coal County, Oklahoma. The main station occupies 220 acres of land typical of approximately two million acres of land in that part of the state.

Half of this farm was originally covered with oak-hickory timber developed on light textured, shallow, well drained soil. Darnell sandy loam is the principal soil type in that area of the station. Most of this area had been cleared, put into cultivation and abandoned for many years before the station was established.

The other half of the station was prairie land that had been cultivated for some 60 years prior to being abandoned. Dennis and Bates are the dominant soil series on this land type.

An alluvial bottom land somewhat typical for the Verdigris soil series

separated the prairie and forested areas. An area of heavy level claypan soil, representative of the Parsons soil series, is located in this area also.

These soil types were mapped within the area and nine pastures were delineated on this basis. A detailed report of this experiment station has been presented by Harper, et al., in Oklahoma Agricultural Experiment Station Bulletin B-348, May, 1950.

The pasture studies are divided into three groupings:

(1) Common bermuda grass-legume pastures established on four land types and receiving various soil fertility treatments;

(2) Weeping lovegrass-legume pastures on one soil type receiving different soil fertility treatments; and

(3) Native grass and improved pastures located on similar land types.

Results of grazing trials on these pastures are presented and discussed in the following pages.

Common Bermuda Grass - Legume Pastures

Description of Pastures

Pastures A, B, C, D, E, and F were established in 1945 with 2 tons of limestone applied per acre to all pastures except A. A local strain of common bermuda grass was planted in May and June of that year. Ten pounds per acre of ryegrass and two pounds of legume seed mixture were planted in September, 1945, on all of these pastures with 150 pounds of superphosphate (20%) drilled in 14 inch rows in pastures C, D, and F. This superphosphate application was repeated in 1948 and 1951.

The legume mixture planted in 1945 contained Big and Little Hop, White Dutch, Ladino, Persian, Alsike, Black Medic, Subterranean clovers and a miscellaneous group of Birdsfoot Trefoil, Button and Bur clovers. Ten pounds of Korean lespedeza per acre was broadcast in March, 1946, and fifteen pounds of Korean-Kobe lespedeza mixture was drilled in all of these pastures in 1948. Pasture G was planted to the local strain of common bermuda grass in 1946. One and one-half tons of limestone per acre were disked into pasture G. The same legume mixture as used in the other pastures was also seeded in pasture G with 200 pounds per acre of 0-14-7 fertilizer. The fertilizer treatment was repeated in 1949 and 1951. The same lespedeza seedings were made in pasture G as in the other pastures.

Land type, pasture size and soil fertility treatment are summarized in Table I.

Experimental Steers Used

Two-year-old Hereford steers were used in 1946 as experimental animals. In 1947, 60 yearling Hereford steers were permanently assigned to various pastures and grazed in these same pastures as two- and three-year-olds. A second herd of 60 yearling Hereford steers was started on grazing experiment in 1950 with individual animals grazed only in permanently assigned pastures until sold as three-year-olds in 1952. Common range type two-year-old Hereford steers were used to complete the grazing seasons in 1949 and 1952 after the three-year-old experimental herds were marketed in July of those years. Sixty yearling Hereford steers were grazed in the experimental pastures in 1953.

LAND TYPE AND PASTURE TREATMENT

Table I. --Land Type, Size, and Soil Fertility Treatment of Common Bermuda Grass-Legume Pastures, Coalgate, Oklahoma.

Land Type	Pastures	Acres	Soil Fertility Treatment
Slowly permeable upland prairie; Dennis loam, Class III land	A	18.16	No treatment.
	B	18.16	Limestone, 2 tons/acre 1945.
	C	18.16	Limestone, 2 tons/acre 1945; 150 lbs. 0-20-0 per acre in 14" rows 1945, 1948 and 1951.
Very slowly permeable claypan prairie soil; Parsons silt loam, Class II land	D	7.45	Limestone, 2 tons/acre 1945; 150 lbs. 0-20-0 per acre in 14" rows 1945, 1948 and 1951.
Alluvial bottom land; Verdigris silt loam, Class I land	E	9.48	Limestone, 2 tons/acre 1945.
	F	9.48	Limestone, 2 tons/acre 1945; 150 lbs. 0-20-0 per acre in 14" rows 1945, 1948 and 1951.
Permeable shallow forested upland; principally Darnell sandy loam, Class IV land	G	23.56	Limestone, 1 1/2 tons/acre 1946; 200 lbs. 0-14-7 per acre in 14" rows 1946, 1949 and 1951.

Beef Produced per Acre

The influence of soil fertility treatment on beef production per acre of bermuda grass-legume pastures is shown in Table II. Characteristics of soil types have been the principal influence on relative productivity of the various pastures receiving the same fertility treatment.

Pasture A located on the slowly permeable upland prairie soil, Dennis Loam, receiving no fertility treatment produced an average of 66 pounds of beef per acre over the eight year period of grazing experiments. Some hop clover and lespedeza are present in the pasture sward during most years. Pasture B supports a greater amount of the hop clovers and less lespedeza than pasture A. Receiving only two tons of limestone per acre in 1945, pasture B has produced an average of 93 pounds of beef per acre over the experimental period. Pasture C, receiving the same limestone treatment as pasture B and superphosphate (20% P_2O_5) at the rate of 150 pounds once every three years has produced an average of 126 pounds of beef per acre. Pasture C supports an abundant growth of the hop clovers with some white and Ladino clover. The lespedezas have been unable to compete with the hop clovers for spring growth in that pasture.

Pasture E and F located on bottomland soil have maintained good growth of hop, white and Ladino clovers during most years. Pasture E, producing 159 pounds of beef per acre, received the same soil fertility treatment as pasture B and has produced an average of 66 pounds more beef per acre than B because of more favorable soil characteristics. Pasture F, producing 219 pounds beef per acre, received the same fertility treatment as pasture C and has produced an average of 83 pounds of beef per acre more than pasture C during the same period as a result of more favorable soil conditions. Pasture D is located on the claypan soil and although this pasture supports good growth of the hop clovers, white and Persian clovers during the spring months, the pasture is adversely affected by very wet and drouthy periods during the growing season. Pasture D produced an average of 122 pounds of beef per acre during the eight year experimental period.

Bermuda grass has not formed a dense sod on the shallow, light textured soil of pasture G and the hop clovers and lespedezas are the prevalent legumes in that pasture. The seven year average of 99 pounds of beef produced per acre in pasture G is less than the other pastures receiving fertilizer.

Gain per Head

Animal size has been related to the per head gains on these bermuda grass-legume pastures. As shown in Table III, the three-year-old steers made high gains in the months of April, May and June. These animal gains of 201 pounds per head in 1949 and 243 pounds in 1953 illustrate the ability of these larger animals to better utilize this type of forage. Yearling and long two-year-old cattle gained averages of 180 to 198 pounds per head during the grazing seasons of 1947, 1950, 1951 and 1953.

BEEF PRODUCTION PER ACRE

Table II. --Pounds of Beef Produced per Acre on Common Bermuda Grass-Legume Pastures on Four Land Types Receiving Various Soil Fertility Treatments, 1946-1953.*

	Land Type, and Treatment						
	Upland Prairie			Claypan Prairie	Bottomland		Shallow Upland
	A	B	C	D	E	F	G
Year	None	Lime	Lime 0-20-0	Lime 0-20-0	Lime	Lime 0-20-0	Lime 0-14-7
1946	65	82	108	111	148	148	---
1947	68	96	130	131	195	230	94
1948	67	99	88	102	193	208	90
1949	91	115	189	179	203	269	133
1950	66	87	103	61	153	204	104
1951	54	92	118	80	114	189	84
1952	61	91	149	146	153	267	112
1953	53	83	124	166	119	209	77
Avg.	66	93	126	122	159	219	99

* See Table I for details of land type and soil fertility treatment.

GAIN PER HEAD

Table III. --Summer Gains per Head of Yearling, Two-year-old and Three-year-old Steers on Common Bermuda Grass-Legume Pastures, 1946-1953.

(Pounds per head)

Grazing Period	Previous winter gain	Av. initial wt. for herd	Summer gain, by pasture							Av. gain all pastures
			A	B	C	D	E	F	G	
Yearling steers, 1947, 1950, 1953										
4/14-11/2, 1947 (202 days)	37	418	212	194	166	157	202	140	---	180
4/17-11/1, 1950 (198 days)	64	546	197	205	178	103	225	177	232	198
4/10-10/1, 1953 (174 days)	56	424	192	214	183	282	158	175	150	193
Two-year-old steers, 1948, 1951										
4/1-11/1, 1948 (214 days)	-1	597	252	273	259	190	305	290	---	273
5/1-11/1, 1951 (184 days)	16	755	195	237	213	148	179	179	204	197
Three-year-old steers, 1949, 1952										
4/11-7/1, 1949 (81 days)	-14	856	183	167	262	223	212	105	---	201
4/8-7/10, 1952 (93 days)	-29	923	194	237	259	256	205	281	244	242

Two-year-old steers gained 273 pounds per head during the 1948 grazing season.

Pasture Carrying Capacity

The carrying capacities of these pastures are presented in Table IV. In general, the stocking rates reflect pounds of beef produced per acre and the size and age of animals grazed. Upland prairie soil with unfertilized bermuda grass, clover and lespedeza (pasture A) in most years produced about half the beef on a higher number of acres than did pasture C located on the same soil type but receiving both lime and superphosphate.

The bottomland pastures have produced more beef per acre requiring fewer acres per animal than similarly fertilized pastures on the upland soils. Pastures D and G, because of their soil characteristics, are disadvantaged during late summer and fall because of their drouthy nature and lowered forage production during that period.

Seasonal Beef Gains and Losses

Tables V and VI indicate when the animal gains were made during the grazing season. In general, these data indicate that the largest gains are made during the months of April and May when hop clover is making its greatest growth. Those pastures that support heavy clover growth are not favorable for lespedeza that must begin its growth during those spring months. Although the low fertility and unfertilized pastures did not receive the benefit of these large spring gains from clover growth, these pastures were able to maintain the rate of gain through the summer months as a result of more lespedeza growth.

September and October are normally drouthy months and are not favorable for forage growth and pasture gains. The high rates of gain produced during the earlier part of the season on the bottomland pastures, E and F, are greatly reduced in the fall months with weight losses occurring in October. The same age steers grazed in the pastures located on the upland prairie soil did not have weight losses in October, but the total pounds of beef produced per acre were less.

Pasture D, located on the claypan soil, is affected earlier in reduced forage production than are pastures on the other soil types during these fall drouths. Pasture G is located on shallow, light textured soil having low moisture holding capacity, and reduced quantity and quality of forage in the dry fall months result in animal weight losses.

ACRES PER STEER

Table IV. --Carrying Capacity of Common Bermuda Grass-Legume Pasture on Four Land Types Receiving Various Lime and Fertilizer Treatments, 1946-1953.*

Year	Age of Cattle	Land Type and Pasture: Upland Prairie A None	Upland Prairie B Lime	Upland Prairie C Lime 0-20-0	Claypan Prairie D Lime 0-20-0	Bottomland E Lime	Bottomland F Lime 0-20-0	Shallow Upland G Lime 0-14-7
1946	2-yr. -olds	4.5	3.6	3.0	2.5	2.4	2.4	---
1947	Yearlings	3.0	2.0	1.3	1.2	1.0	.6	2.6
1948	2-yr. -olds	3.6	2.6	2.6	2.5	1.2	1.0	3.0
1949 4/11-7/1	3-yr. -olds	4.5	3.0	2.0	1.9	1.9	1.3	2.6
1949 7/2-10/21	2-yr. -olds	3.6	2.6	2.0	1.9	1.6	1.2	2.6
1950	Yearlings	3.6	2.6	1.8	2.3	1.5	1.0	2.2
1951	2-yr. -olds	3.6	2.6	2.0	1.9	1.6	1.2	2.7
1952 4/10-7/10	3-yr. -olds	3.6	3.0	2.0	1.9	1.3	1.1	2.6
1952 7/11-10/1	2-yr. -olds	3 6	3.0	2.6	2.4	1.9	1.3	3.3
1953	Yearlings	3.6	2.3	1.5	1.9	1.4	.8	1.5

* See Table I for details of land type and soil fertility treatment.

DAILY GAIN BY MONTH

Table V. --Average Beef Gain per Day, by Months, on Common Bermuda Grass-Legume Pastures on Four Land Types Receiving Various Lime and Fertilizer Treatments, 1946-1953.

(Pounds per head**)

Pasture	Fertility Treatment*	April	May	June	July	Aug.	Sept.	Oct.
A	None	2.7	2.3	1.7	.9	1.2	.8	.5
B	Lime	2.3	2.8	1.6	1.1	1.1	.7	.3
C	Lime, 0-20-0	2.9	3.0	1.7	1.1	1.8	.5	.2
D	Lime, 0-20-0	3.0	2.7	1.6	.8	.9	.4	.2
E	Lime	2.6	2.7	1.6	1.0	1.1	.8	-.3
F	Lime, 0-20-0	3.0	2.7	1.8	.7	1.1	.7	-.4
G	Lime, 0-14-7	2.5	2.4	1.7	1.2	1.2	1.2	-.5

* See Table I for land type and fertility treatment.

** Average for all age steers used. Only actual days pastured used as basis in computing these average figures.

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BEEF GAINS BY MONTH

Table VI. --Average Beef Production per Acre, by Months, Common Bermuda Grass-Legume Pastures on Four Land Types Receiving Various Lime and Fertilizer Treatments, 1946-1953.

(Pounds per acre**)

Pasture	Fertility Treatment*	April	May	June	July	Aug.	Sept.	Oct.
A	None	12.0	19.1	14.5	6.0	10.1	6.1	1.8
B	Lime	13.3	31.9	17.9	9.8	13.7	8.3	3.3
C	Lime, 0-20-0	25.1	48.8	26.5	10.0	16.2	6.5	.7
D	Lime, 0-20-0	30.0	47.6	26.3	10.6	13.2	4.2	1.2
E	Lime	32.3	58.9	32.5	17.4	23.7	12.6	-9.3
F	Lime, 0-20-0	51.0	81.8	52.3	11.0	29.3	15.4	-9.8
G	Lime, 0-14-7	16.5	30.2	21.5	9.5	14.3	13.9	-5.1

* See Table I for land type and fertilizer treatment.

** Average for all age steers used. Only actual days pastured used as basis in computing these average figures.

Weeping Lovegrass-Legume Pastures

Description of Pasture

Two pastures of weeping lovegrass were established at the Coalgate Station on an eroded, shallow soil of the Darnell series. The soil is somewhat typical of much of the formerly cultivated land of the Cross Timber areas of the state. It is characterized by a low fertility level, low organic matter content, and moderate permeability. Most of this type land previously used for production of cultivated crops has been abandoned because of low productivity and susceptibility to erosion.

The experimental area was divided into two irregularly shaped pastures designated as H and I. One and one-half tons of limestone per acre was applied to pasture I in 1946. Weeping lovegrass was planted in both pastures in April, 1946, by drilling in 14-inch rows. An 0-14-7 fertilizer was drilled in 14-inch rows at the rate of 200 pounds per acre in pasture I in September, 1946. A legume mixture was drilled in both pastures at rate of two pounds per acre. The legume mixture contained big and little hop clover, White Dutch, Ladino, Persian, Alsike, Black Medic, Subterranean clovers and a miscellaneous group of Birdsfoot Trefoil, Button and Bur Clovers. Ten pounds per acre of Korean Lespedeza was planted in the spring of 1947, and fifteen pounds per acre of a Korean-Kobe Lespedeza mixture was drilled in these pastures in March 1948. Two hundred pounds per acre of 0-14-7 fertilizer was drilled in pasture I in 1949 and in 1951.

Beef Production on Lovegrass Pastures

Results of grazing studies with the weeping lovegrass pastures are presented in Table VIII.

Beef production of 109 pounds per acre on the fertilized pasture (I) was double that of the unfertilized pasture (H) producing 54 pounds of beef per acre. Hop clovers and annual lespedezas provided large amounts of high protein forage during most grazing seasons in pasture I as a result of soil fertilization. An old planting of bermuda grass in the west half of these two pastures had taken over much of that portion of the fields during the last three years of experimental grazing trials.

The highest average beef gains per day were made in April and May in both pastures when the hop clovers are at their best. Weeping lovegrass also produces palatable forage during those months. Good lespedeza growth was obtained in the fertilized pasture I and contributed to beef gains during July, August, and September. The amount and quality of the forage available is limited during late summer and fall months on the shallow, light textured soil on which these pastures were located. Forage production on this soil type, Darnell sandy loam, is more seriously affected during periods of low rainfall because of low moisture holding capacity. Animals in both pastures H and I lost weight in October.

WEEPING LOVEGRASS-LEGUME BEEF PRODUCTION

Table VII. --Effect of Lime and Fertilizer on Beef Production, Weeping Lovegrass-Legume Pastures, Darnell Sandy Loam, 1947-1952.

	Pasture; and Treatment	
	H (12.32 acres)	I (12.40 acres)
	No treatment	Lime 0-14-7*
Beef Production per Acre by Years (pounds)		
1947	53	84
1948	57	98
1949	56	136
1950	51	132
1951	51	90
1952	54	115
Average	54	109
Average Daily Gain per Head by Months (pounds)**		
April	2.0	2.2
May	1.9	3.0
June	1.5	1.6
July	1.0	1.1
August	.9	1.1
September	1.2	1.4
October	- .8	- .5
Beef Production per Acre by Months (pounds)**		
April	7.8	12.0
May	16.5	40.1
June	12.1	21.8
July	5.4	10.3
August	7.9	22.8
September	10.7	17.3
October	- 6.0	- 4.9

* Pasture I received 1 1/2 tons limestone per acre 1946 and 200 lbs. 0-14-7 per acre applied in 14" rows 1946, 1949 and 1951.

** Average for all age steers used. Only actual days pastured used as basis in computing these average figures.

Native Grass and Improved Pastures:

Description of Pastures

A 300-acre experimental area was selected in 1948 to find the value of pasture improvement on overgrazed native grassland. This area was divided into two 150-acre pastures. Each pasture contains about 50 acres of land too steep or stony to cultivate, approximately 15 acres of bottomland, and 85 acres of tillable upland.

The bottomland in the improved pasture was cleared of timber and planted to a local strain of common bermuda grass plus big hop and white clovers. Forty-six acres of upland were cleared of persimmons, disked, fertilized with 200 pounds of 0-20-0 per acre and planted to a mixture of Kobe and Korean lespedeza at a rate of 20 pounds per acre drilled in 14 inch rows. The lespedeza mixture was replanted with the same rate of phosphate in 1953. About 38 acres of tillable upland in the improved pasture have been plowed and planted to rye and vetch each year to furnish some winter and early spring pasture.

Beef Produced with Cow-calf Herd

These two pastures were used to support cow-calf herds from 1949 through 1952. The pasture carrying capacity, number of calves produced, and calf weights at nine months were used as measures of pasture productivity.

A stocking rate of one cow and calf for 10 acres of unimproved pasture was used at the start of grazing trials in 1949 with one cow and calf for 6 acres on the improved pasture. The numbers of animals were increased in 1951. As a result of the dry weather in 1951 and 1952 the carrying capacity of the pastures decreased. Four years' data from this experiment are presented in Table VIII.

The larger number of calves produced on the improved side had higher weaning weights at 9 months of age during the first three years of the experiment. There was less difference between the weaning weights of calves in both pastures as the experiment continued. In 1952 the weaning weights were approximately the same, although more calves were raised in the improved pasture. On the unimproved native grass pasture the four-year average was 14 calves from 16 cows with average weaning weights of 391 pounds. The improved pasture produced an average of 21.8 calves from 26 cows weighing 421.5 pounds at weaning during that period.

Beef Produced with Yearling Cattle

In 1953, the beef production of these pastures was measured with yearling Hereford cattle. The stocking rate used was one animal per five acres on the unimproved pasture and one animal per three and one-half acres on the improved side. Average gains per head and per acre are presented in Table IX.

COW-CALF PRODUCTION; NATIVE GRASS AND IMPROVED PASTURES

Table VIII. --Numbers of Calves, Average Calf Weight, and Total Pounds of Beef Produced by Calves in Native Grass and Improved 150-acre Pastures of Similar Land Types, 1949-1952.

	Improved Pasture		Native Grass Pasture		Av. weight of calves in Lbs. at 9 mo. of age		Total Production beef in Lbs.	
Year	No. of Cows	No. of Calves	No. of Cows	No. of Calves	Improved Pasture	Native Grass Pasture	Improved Pasture	Native Grass
1949	25	20	15	12	413	326	8,260	4,950
1950	25	20	15	12	478	452	9,560	5,424
1951	28	26*	18	18	398	388	10,340	6,690
1952	26	21**	16	14	397	398	7,940	5,535
Avg.	26	21.8	16	14	421.5	391	9,025	5,649.8

* Two calves died.
** One calf died.

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YEARLINGS ON NATIVE AND IMPROVED PASTURE

Table IX. --Average Weights and Gains of Yearling Cattle on Native Grass and Improved 150-acre Pastures of Similar Land Types, 1953.

(Pounds)

	Native Grass Pasture (6 heifers, 24 steers) 5 A. per head		Improved Pasture (9 heifers, 31 steers) 3.75 A. per head	
	Average per Head	Gain	Average per Head	Gain
April 4 (initial)	355	---	376	---
June 18	530	175	553	177
August 9	557	27	548	- 5
October 17 (final)	624	67	633	85
Average for season				
Per head		269		257
Per acre		53.9		68.4

Nine heifers and 31 steers were grazed in the improved pasture. These yearling cattle had an average initial weight of 376 pounds and had an average per head gain of 257 pounds for the grazing season. Six heifers and 24 steers were grazed in the unimproved native grass pasture. They had an initial weight of 355 pounds and had an average per head gain of 269 pounds for the grazing season. The gains per acre were slightly higher for the improved pasture, 68.4 pounds, as compared to 53.9 pounds on the unimproved native grass pasture.