



Trends in size, land tenure, income, organization, and management of selected cattle ranches in southeastern Montana, 1924-48
by A Dale Saunders

A THESIS Submitted to the Graduate Committee in partial fulfillment of the requirements for the Degree of Master of Science in Agricultural Economics
Montana State University
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Abstract:

This is a study of the trends and changes that have taken place on twenty-one cattle ranches in southeastern Montana during the past twenty-five years. Some of the more important changes that have taken place during this time are: (1) The amount of controlled land used by the ranches has increased by 159%. The most important increase in size has come about through the purchase of more land, much of which was formerly owned in small uneconomical tracts by homesteaders.

(2) The era of free land and uncontrolled use of the Public Domain has come to an end. The ranchers have the firmest control over the land they use than at any other time in the history of cattle ranching in Montana.

(3) The ranchers appear to be more concerned with the way the range is used and stocking rates have been reduced.

(4) During the past twenty-five years there has been a shift from the marketing of three-year-old steers to the marketing of calves and yearlings. In 1924 the ranchers marketed 213 pounds of beef per animal unit of livestock run, by 1948 this had increased to 332 pounds of beef per animal unit of livestock run.

(5) Breeding practices have shifted from breeding on common range with other herds to breeding in private pastures. This change has helped increase the percentage of calf-crop.

(6) The amount of investment per animal unit in the past twenty-five years has nearly doubled, the chief factor causing this increase was a 155% increase in deeded land.

(7) The amount of debt per animal unit has decreased in the past twenty-five years by 37%. Only 26% of the ranchers had any debts in 1948 compared with 79% of the ranchers in 1924.

(8) During the period studied, inputs have increased by 130%, the major increases were in general supplies, taxes, and depreciation on buildings and machinery. The only input that showed a decrease during the period was interest paid on debts.

(9) The most profitable year for the ranchers during the study was 1948, and the least profitable was 1924. The most important factor accounting for the high income in 1948 was the favorable relationship between the prices of inputs and outputs.

TRENDS IN SIZE, LAND TENURE, INCOME,
ORGANIZATION, AND MANAGEMENT
OF SELECTED CATTLE RANCHES
IN SOUTHEASTERN MONTANA,
1924 - 48

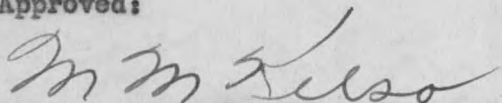
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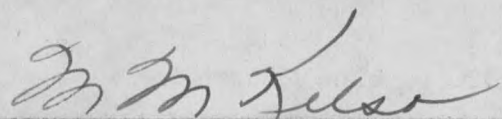
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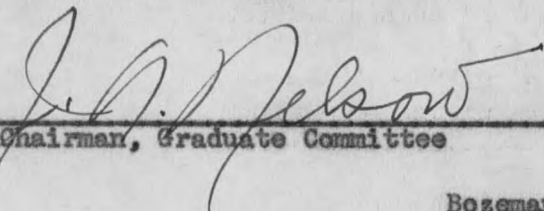
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Leslie's Script

LESIE PAPER

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ABSTRACT

This is a study of the trends and changes that have taken place on twenty-one cattle ranches in southeastern Montana during the past twenty-five years. Some of the more important changes that have taken place during this time are:

(1) The amount of controlled land used by the ranches has increased by 159%. The most important increase in size has come about through the purchase of more land, much of which was formerly owned in small uneconomical tracts by homesteaders.

(2) The era of free land and uncontrolled use of the Public Domain has come to an end. The ranchers have the firmest control over the land they use than at any other time in the history of cattle ranching in Montana.

(3) The ranchers appear to be more concerned with the way the range is used and stocking rates have been reduced.

(4) During the past twenty-five years there has been a shift from the marketing of three-year-old steers to the marketing of calves and yearlings. In 1924 the ranchers marketed 213 pounds of beef per animal unit of livestock run, by 1948 this had increased to 332 pounds of beef per animal unit of livestock run.

(5) Breeding practices have shifted from breeding on common range with other herds to breeding in private pastures. This change has helped increase the percentage of calf-crop.

(6) The amount of investment per animal unit in the past twenty-five years has nearly doubled, the chief factor causing this increase was a 155% increase in deeded land.

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(8) During the period studied, inputs have increased by 130%, the major increases were in general supplies, taxes, and depreciation on buildings and machinery. The only input that showed a decrease during the period was interest paid on debts.

(9) The most profitable year for the ranchers during the study was 1948, and the least profitable was 1924. The most important factor accounting for the high income in 1948 was the favorable relationship between the prices of inputs and outputs.

PART I. INTRODUCTION

The Area

The two-thirds of Montana that lies east of the Rocky Mountains is a part of the Northern Great Plains which composes a tenth of the land area within the United States. In addition to Montana the Northern Great Plains include the eastern third of Wyoming, the northeastern corner of Colorado, and the three quarters of the Dakotas and Nebraska which lies west of the ninety-eighth meridian.^{1/}

The elevation of the Plains region of Montana varies from about two to four thousand feet. In general the land is rolling with rough and broken "badlands" areas being found near many of the larger streams and rivers. The soil types in the area show a considerable degree of variation though from a pedological standpoint they are generally young and unglaciated.^{2/}

One of the outstanding characteristics of the area is the semi-arid and highly unpredictable climate. The temperature at Miles City has varied from a low of 49 below zero to a high of 111° F.^{3/} The average annual precipitation for the area is between 12-15 inches with about 70 percent of this coming in the growing season months of April 1 to September 30.^{4/}

^{1/} Rogler, G.A., and Hortt, L.C., "The Northern Great Plains," Grass Yearbook of Agriculture, 1948, U.S.D.A., p. 477.

^{2/} Gieseke, L.F., Morris, E.R., Straborn, A.T., and Manifold, V.B., Soil Survey of The Northern Plains of Montana, Series 1929, No. 21, Bureau of Chemistry and Soils, U.S.D.A. in cooperation with the Montana Agricultural Experiment Station.

^{3/} Climate and Man, Yearbook of Agriculture, 1941, U.S.D.A., p. 995.

^{4/} Annual and Seasonal Precipitation at Six Representative Locations in Montana, Bul. 447, Montana Agricultural Experiment Station, November 1947, p. 14.

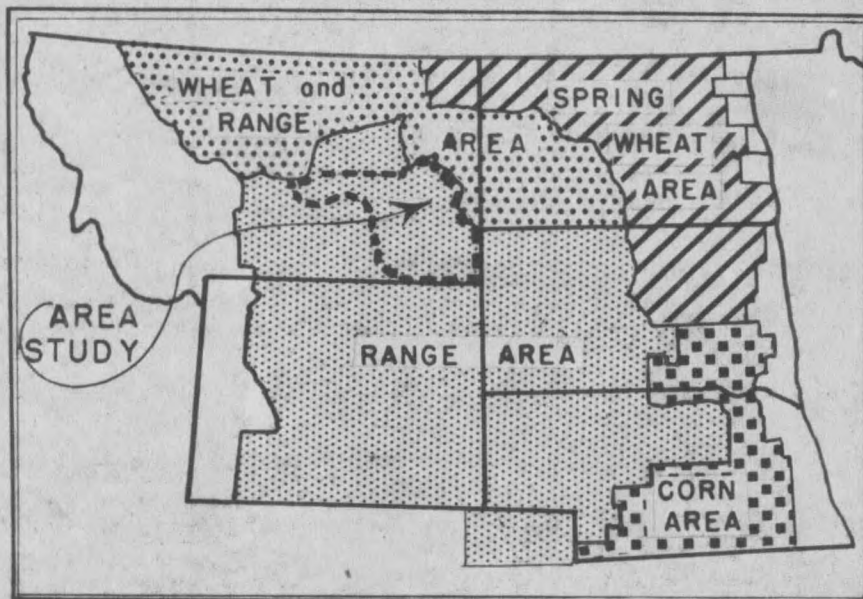


Figure 1.

Map of the Northern Great Plains showing the generalized types of farming areas and the location of the area of study.

Source: Grass, Yearbook of Agriculture, 1948, U. S. Department of Agriculture, Government Printing Office, Washington, D. C.

The important factor in regard to rainfall in the Northern Great Plains is that the annual precipitation varies around a critical point - that at which successful wheat production begins. In years of above average precipitation wheat yields are high but, in years of below average precipitation, wheat yields are reduced, sometimes to zero.^{5/} Another unique factor about the precipitation in the Northern Great Plains is that years of high and low precipitation do not tend to alternate, but instead tend to come in "bunches".^{6/} As shown in Figure 2, these groups of wet and dry years are sometimes as long as ten to eleven years.

Looking back to Figure 1, the northern half of the Plains region in Montana is generally devoted to small grain farming and livestock ranching. The southern part of the area is devoted mainly to range because climate, soil or topography makes crop production too risky. The principal species of native grasses found in this region are blue grama, western wheatgrass, needle-and-thread, Sandberg bluegrass, and the sedge niggerwool. The significance of grass as a crop in the range area is well stated by M. M. Kelso; "Grassland as range occupied some 85% of the land in 1944 and supplied about one-half of the nutrients needed by the livestock, which supplied about three-fourths of the gross agricultural income. Grassland as hay furnished about 30% of the feed required by the livestock."^{7/}

^{5/} Clawson, Marion, "Sequence in Variation of Annual Precipitation in the Western United States," The Journal of Land and Public Utility Economics, August 1947, Vol. XXIII, No. 3, p. 273.

^{6/} Ibid, pp. 273 and 278-279.

^{7/} Kelso, M. M., "The Place of Grassland Farming," Grass, Yearbook of Agriculture, 1948, U.S.D.A., pp. 481 and 482.

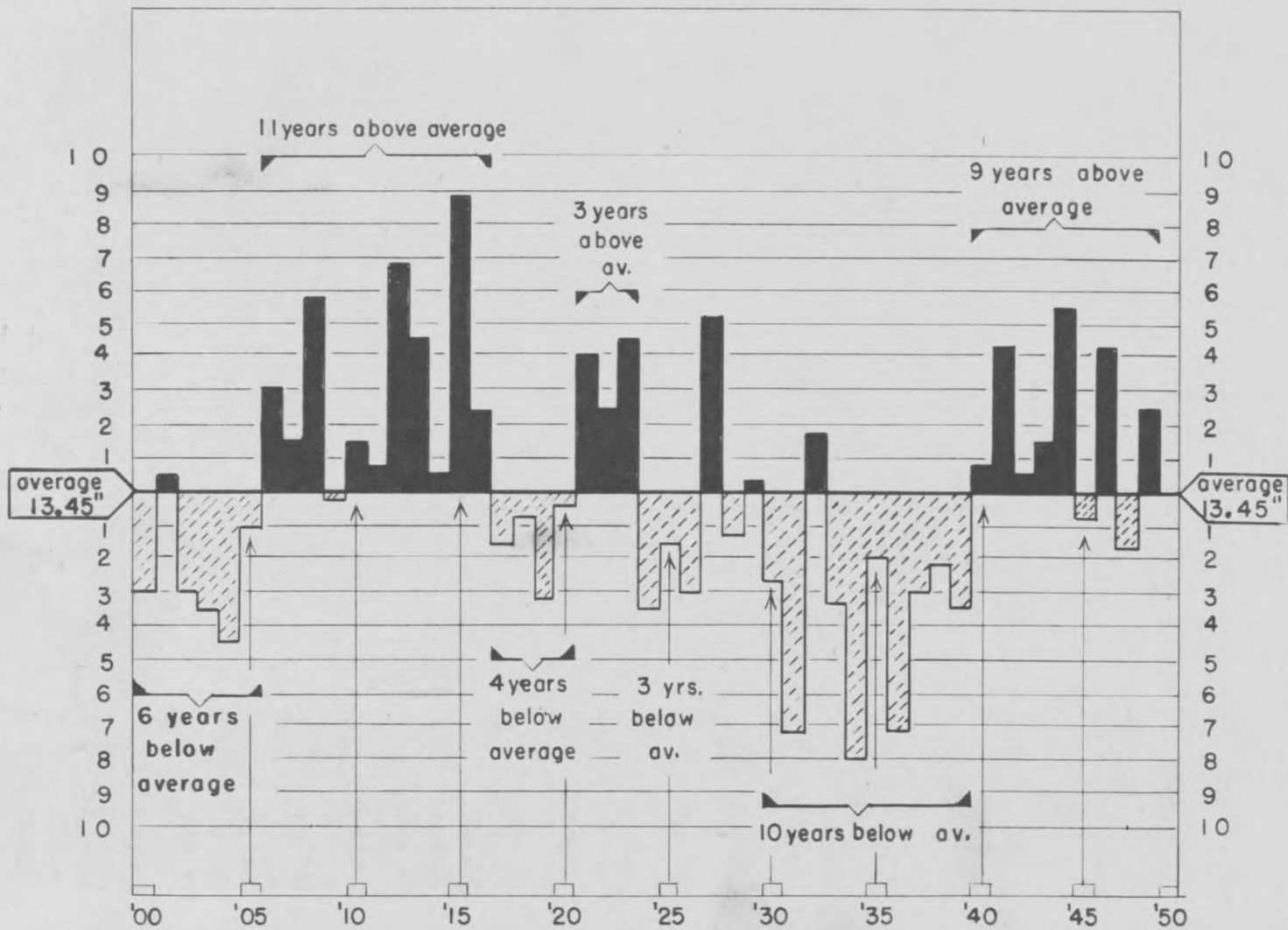


Figure 2.

Rainfall deviation from average at Miles City, Montana, 1900 - 1948.

Source: Annual and Seasonal Precipitation at Six Representative Locations in Montana, Bul. 447, November 1947, Montana Agricultural Experiment Station, Bozeman, Montana.

The Situation

The range livestock industry in the Plains region in southeastern Montana dates back to about 1880. At that time the range was "open" and the size of a man's ranch and the number of cattle he ran depended largely upon his ability to control his range and to deal with other men. Boundaries were indefinite and fences were a thing of the future. During this early period the principal type of cattle marketed from the area were grass fattened steers often run to an age of five to six years and weighing over twelve hundred pounds. The operation under this type of a set-up was a low cost one, and profits depended largely upon the volume of cattle run and sold, management was of secondary importance, hence the ranches were large in size.^{8/}

As more people migrated West, attracted by the offer of free land and the idea of getting started in farming, the cattle industry was forced to change its ways. As the pressure on the land from the new settlers increased, and was brought to its peak during the homesteading days of the nineteen-tens and early twenties, the size of ranches were drastically reduced and more thought had to be given to management and the type of cattle being raised. Volume alone was no longer the key to success in ranching.

The ranchers who were using the range at the time of the onslaught of homesteaders and who managed to continue in operation did so on: (1) land purchased or leased from the Northern Pacific Railroad; (2) land they themselves were able to homestead, (quite often all of the hired help was filed

^{8/} Fletcher, R.S., Organization of the Range Cattle Business in Eastern Montana, Montana Agricultural Experiment Station, Bul. 265, June 1932.

as homesteaders;) (3) land controlled by controlling water - often the ranchers strung their homesteads out in tracts of forty acres along creeks or rivers; (4) lands that were not even attractive to homesteaders.

Since the establishment of the cattle ranching industry in Montana sometime around 1880, it has gone through a series of varying conditions. Unique among the varying conditions with which the industry has been faced, is that generally during the "bunches" of years when the rainfall was above average the prices for beef cattle was above average, and during the "bunches" of below average rainfall years, the prices of beef cattle was below average. This phenomenon has been observed from the records, but there is nothing to indicate a scientific reason for its occurrence.

During the past twenty-five years, the period with which this thesis is concerned, the cattle ranches in southeastern Montana have undergone three periods of varying conditions. The first period, from 1924 to 1930, was one of nearly normal conditions. The price of beef cattle was about ninety cents below average for the twenty-five year period and the rainfall was only .06 inches below the average for the twenty-five year period. The second period, which was from 1931-1939, was one of extreme hardship for most of the ranchers in the area. The price of beef cattle was off by about 40%, and rainfall was 25% below normal. The third period, 1940 to date, has been the best period known to the ranchers of Montana. Not only has the price of beef cattle been the highest for any nine year period in history but rainfall has also been well above average for the entire period.

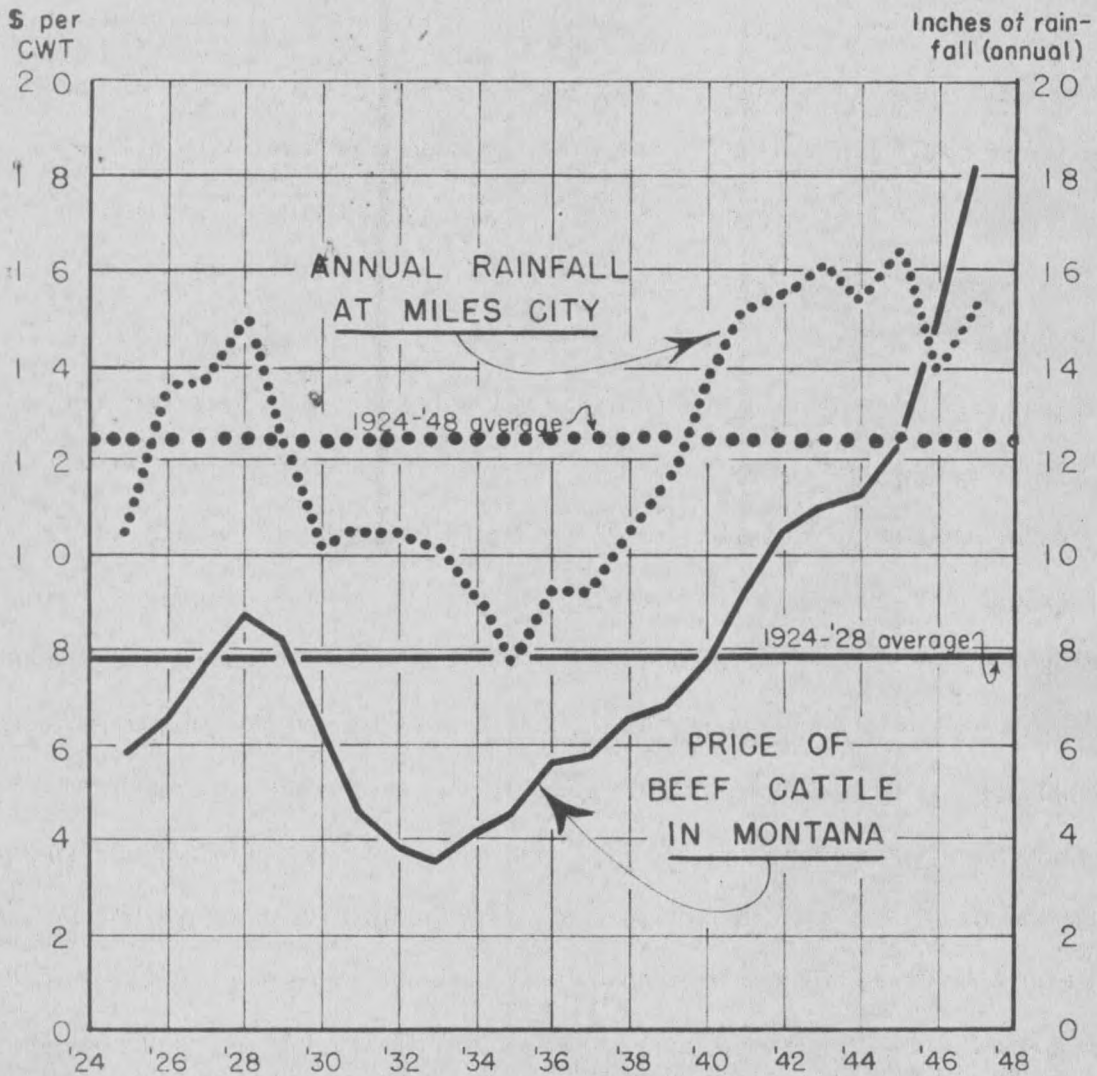


Figure 3.

A comparison of the prices received by ranchers, and the amount of annual rainfall in Miles City, Montana, 1924 - 1948.

Comparison is on a three year moving average. Source: Annual and Seasonal Precipitation at Six Representative Locations in Montana, Op. Cit. and Montana Farm and Ranch Prices, 1909-1948, Mimeographed Circular 51, April 1949, Montana Agricultural Experiment Station, Bozeman, Montana.

The twenty-five year period was also characterized by a number of changes in land tenure. A large amount of the public domain that was being used without title or cost came under the direct supervision of the Federal Government with the passing of the Taylor Grazing Act of 1934. Another important change was the large amount of land that went into the hands of the county for taxes during the thirties that has returned to private ownership under the stimulus of high incomes in recent years. Of still greater importance was the trend of many of the small land owners leaving the area, the units they left being added to neighboring farms and ranches; thus, some of the homesteading farmers were able to adapt to the conditions of the area by becoming stockman.

The Plains have always been affected with ever changing conditions, the weather usually being the most violent of the changes. The problem that naturally arises is how to achieve a system of operation that is flexible enough to cope with the ever changing conditions, and at the same time give the operator a fairly stable income.

The Purpose and Objectives

The purpose of this study is threefold: (1) To find and analyze the changes that have taken place in the cattle ranching industry in southeastern Montana in the past twenty-five years, and; (2) To determine in the light of these changes steps that might be taken to adjust to the varying conditions, and; (3) What the future is likely to hold for ranching in the area.

Specifically the objectives of this study are:

- (1) To study trends and changes in the land tenure and size of the land base of the selected ranchers. Tenure will be considered

from the standpoint of: (a) land owned, (b) land leased - from whom (private persons or corporations, or from some government agency - federal, state, or local), (c) land used on an animal unit permit basis, (d) free land.^{9/}

(2) To study the changes that have taken place in factors of production and management, and how these changes have affected costs, income and investments.

(3) To consider how the changes that have taken place will affect the future of cattle ranching in the area.

The Sample

The bases for this study are twenty-one ranches that are located in the Great Plains region of southeastern Montana. These particular ranches were used because there were complete business records available for either 1924 or 1929, 1940, and 1948.^{10/}

These twenty-one ranches are located in Musselshell, Rosebud, Custer, Powder River, Carter, and Prairie counties. With the exception of a small area along the principal rivers, the whole region is devoted mainly to the grazing of livestock. Over 75% of the land in the area is classified

^{9/} Free land refers to all land not owned by the user which he is using without charge. Public Domain was in this classification till after the passage of the Taylor Grazing Act in 1934.

^{10/} These records were taken in connection with ranching studies and surveys that have been made in the past. These surveys include: (1) The Northern Great Plains Survey of 1925, by the United States Department of Agriculture in cooperation with the Agricultural Experiment Stations of Montana, North Dakota, South Dakota, and Wyoming; (2) A similar study by the same group in 1928; (3) Montana Ranch Studies by M. H. Saunderson for the years 1929 to 1933; (4) Montana Ranch Study by G. H. Craig, 1940; and (5) A follow-up survey of this same group of ranches made in the spring of 1949 by Dr. M. M. Kelso and the author.

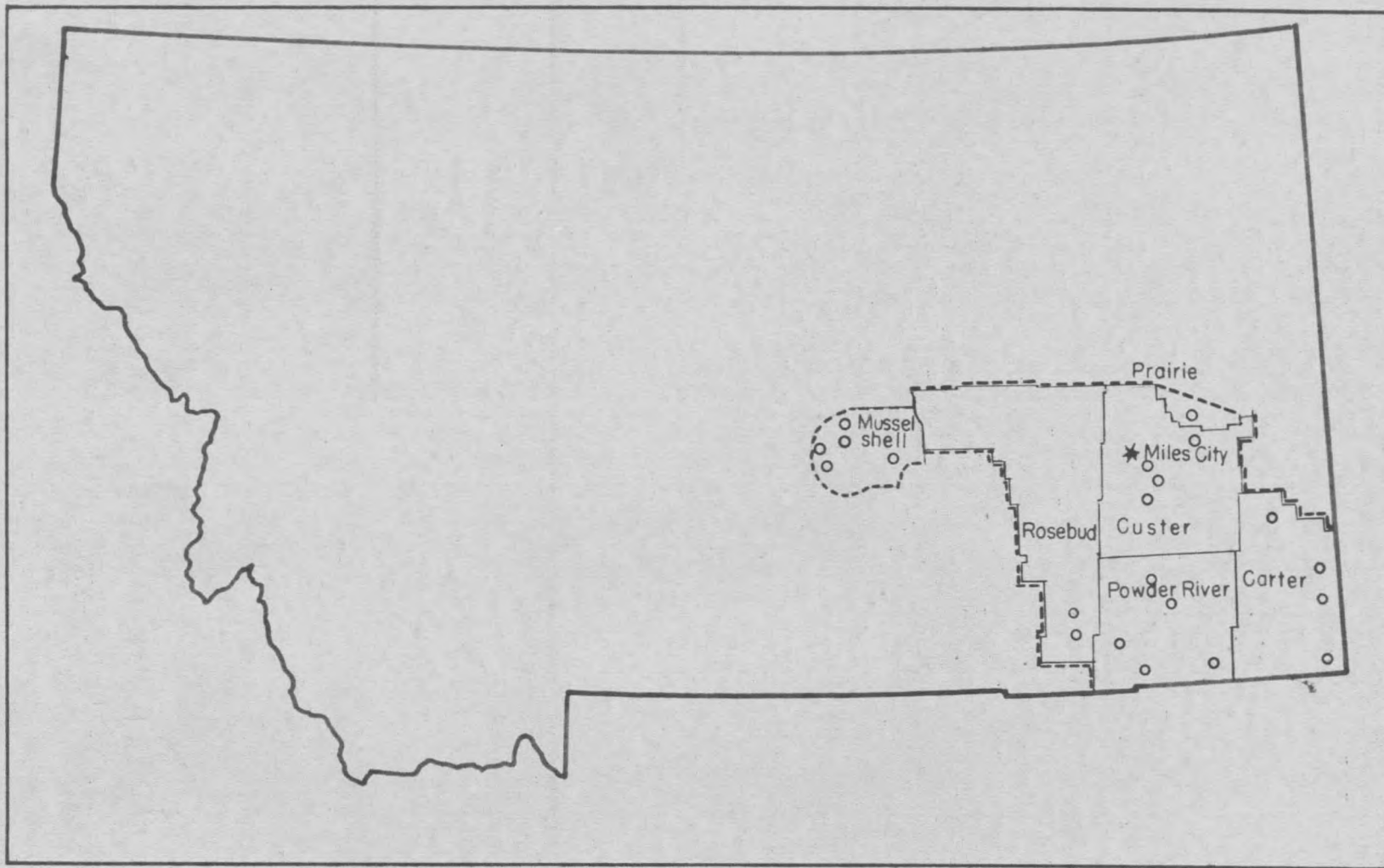


Figure 4.

Map of Montana showing the location of the twenty-one ranches studied.

as suitable for grazing land only. Farming on other than the irrigated land is of secondary importance except for the production of hay and some feed crops for winter feeding.^{11/} The number one source of income in the area is from range livestock. The income from beef cattle is greater than that from all other agricultural sources combined.^{12/}

These ranches were originally picked at large from ranches in the area that were greater than one hundred animal units in size and whose principal source of income was from the sale of beef cattle.^{13/} The ranches vary from one hundred to about fifteen hundred animal units in size. Due to economic and climatic factors, the size of these ranches, over the period of years, has fluctuated considerably both in the amount of land controlled and the number of cattle run. There have also been changes in ownership in some cases due to deaths and retirements, but in all cases these ranches represent the same basic original ranch units from which first records were taken in either 1924 or 1929.

Since it is the intent of this study to follow through the years the changes that have taken place on the same ranch units, and not compare

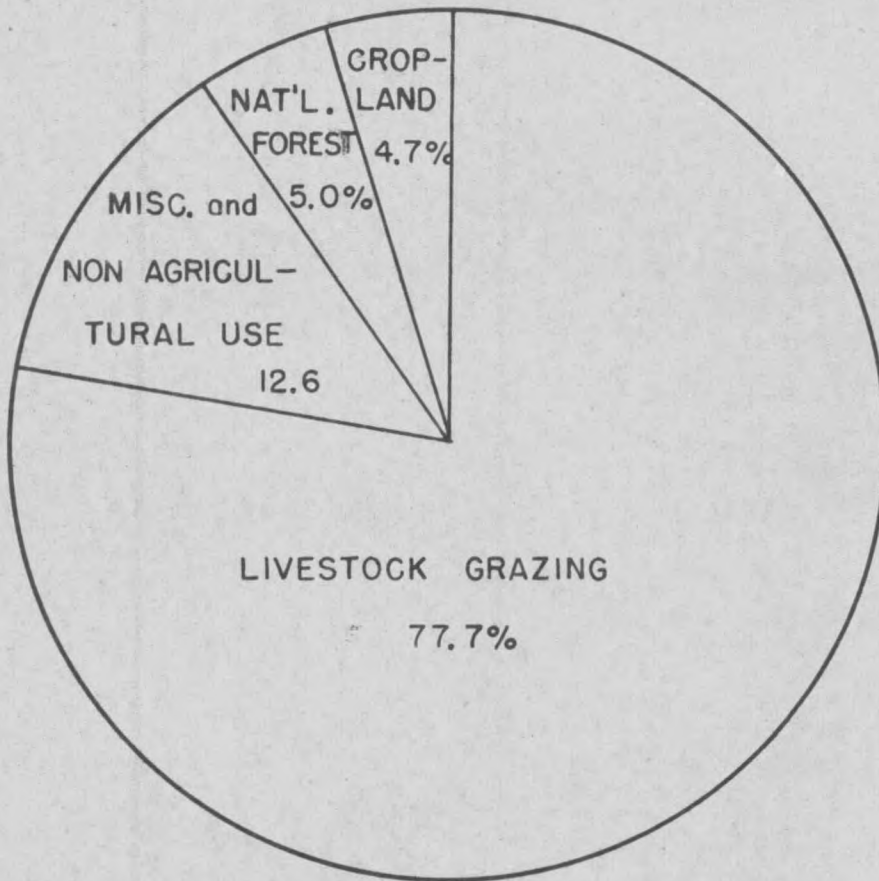
^{11/} Gilman, V.D., Types of Farming in Southeastern Montana, Bul. 287, April 1934, Montana Agricultural Experiment Station, p. 11.

^{12/} Compiled from, U.S. Census of Agriculture, 1945, Volume I, Part 27, U.S. Dept. of Commerce, Bureau of the Census, Washington, D.C.

^{13/} An animal unit is the equivalent of a 1,000-pound range cow with calf. A yearling is considered as being equivalent to 2/3 of an animal unit; a two-year-old .85; a three-year-old steer is one unit; bulls and horses 1 1/3 units each. Ewes are considered to be equivalent to .2 of a unit. These units represent the approximate relationship of different classes of cattle in annual range and feed requirements.

M.H. Saunderson and D.W. Chittenden, Cattle Ranching in Montana, Bul. 341, May 1937, Montana Agricultural Experiment Station, p. 9.

When animal units of grazing are spoken of in this thesis, a unit refers to one animal unit of grazing for a full twelve-month year.

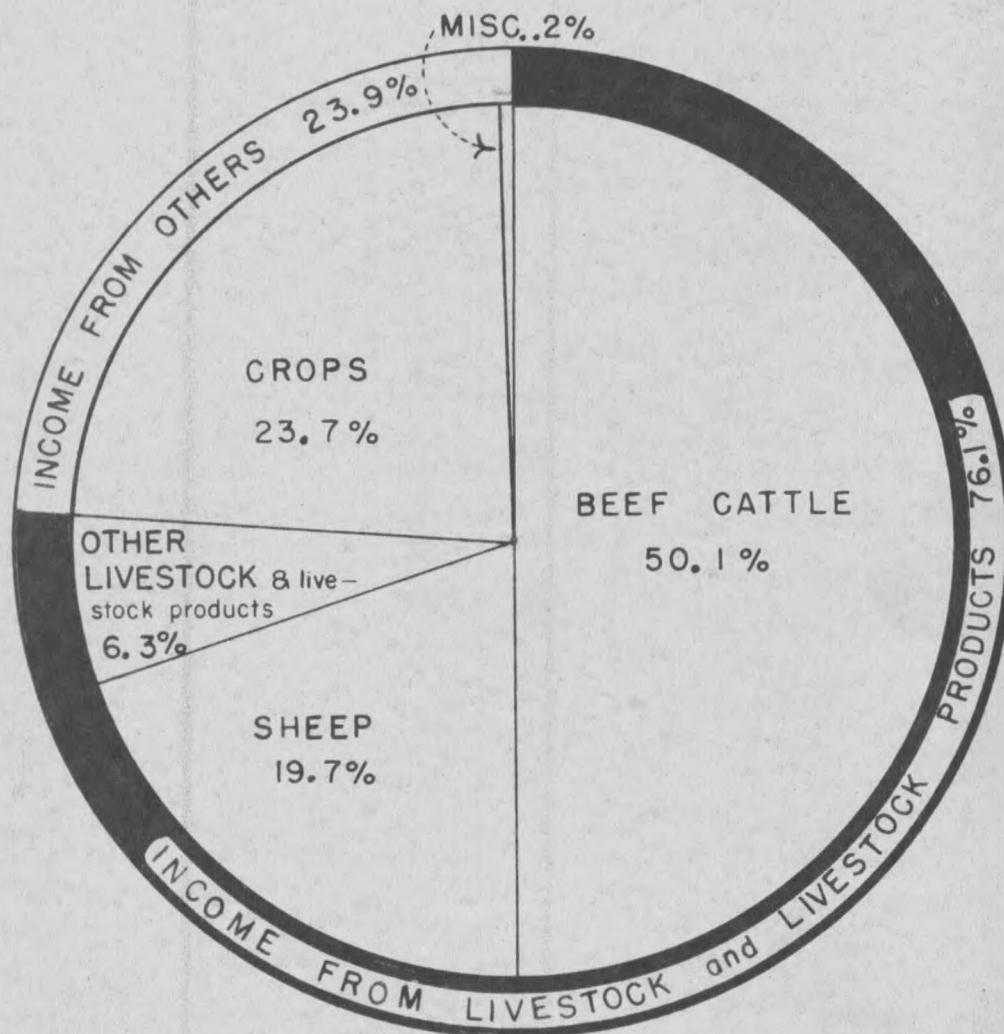


TOTAL LAND AREA: 12,165,120 ACRES

Figure 5.

Land use in 1944, in six counties in Southeastern Montana.

(Counties: Musselshell, Rosebud, Custer, Powder River, Carter and Prairie.) Source: United States Census of Agriculture, 1945.



TOTAL AGRICULTURAL INCOME: \$16,351,635

Figure 6.

Sources of agricultural income in six counties in Southeastern Montana, in 1944.

(Counties: Musselshell, Rosebud, Custer, Powder River, Carter and Prairie.) Source: United States Census of Agriculture, 1945.

averages for the whole area, the number of cases making up the sample is relatively small. Because of the small number of ranches being studied it must be realized that reliability of the data from a statistical standpoint is limited when using it as a sample of the trends for the entire area. The average size of the ranches in the sample is also larger than the average for all ranches for more than a hundred animal units in the region.^{14/} Another factor of bias that may also be present is that most of these ranches have remained under the same ownership and have possibly been a little more successful in their long run management than the average ranch in the area.

Another difficulty involved in the analysis was that records were not always available in complete form in every year. In 1924 only fourteen ranch records were available while in 1929 there were only thirteen records taken on the twenty-one ranches. Complete records on all of the twenty-one ranches were available for 1940. In 1948, all twenty-one of the ranches were visited and some information was attained from each; however, full and complete records were not obtained in three cases. Because of the variations in the sample in the different years the exact averages given in this paper are not always absolutely accurate, but a careful study of the ranches from the information available indicates that these ranches did not differ sufficiently from the other ranches in any particular year to effect the general trends and changes that are the main concern of this study.

^{14/} In 1944, the average size cattle ranches in southeastern Montana, excluding all ranches under 100 animal units, was between 263 and 287 animal units. Data compiled from unpublished material on file with the Bureau of Agricultural Economics, at Montana State College, originally compiled from U. S. Census of Agriculture, 1945.

With these limitations in mind, by studying these ranches from a case history standpoint the sample is probably large enough to indicate the major changes that have occurred in the operation and management of cattle ranches in the area.

Method of Analysis

In this study, costs, investments, factors of production, land and land use have been computed in relation to animal units. This has been done to give the study a common denominator and to help in facilitating comparisons. Although it was originally planned to break the ranches up into various size groups, this was abandoned, because there were not enough cases contained in the smaller groups to give any significance at all to them. The information presented, unless otherwise specified, will represent an arithmetic average of the complete sample for the specified year.

PART II. SIZE AND LAND TENURE

Introduction

One of the biggest questions of management and stability that has always plagued the rancher in southeastern Montana is whether to lease or to own his range. The rancher who leases his land usually has lower cost of operation but is often in a state of uncertainty about his future operation. The man who owns his own range is much more certain of his future operations but is often faced with higher operating costs.^{15/}

The other unique situation that most of the ranchers are faced with is that a large amount of the range land they use belongs to the Federal Government. The public ownership of land, utilized by private individuals for private profits, is practically unknown in any other type of agricultural enterprise in our country.

Increase in Land Area of Ranches

Since 1924, the amount of controlled land per ranch has been increasing. Table I shows that the average amount of land per ranch more than doubled between the 1924-29 period and 1940. By 1948 the size of the same ranches had again increased by an average of over 2,800 acres per ranch, (the difference between 1924 and 1929 is not significant as this difference was caused mainly by variations in the sample.) As important to the ranchers as the total increase in acreage is how this increase has come about.

^{15/} Kelso, M.M., Remarks Concerning the Public Grazing Land Question, made during the round table discussion of that problem at the meeting of the Montana Stockgrowers Association, Butte, Montana, May 23, 1947. Unpublished information in the Montana State College files.

TABLE I. THE AVERAGE SIZE AND LAND TENURE
OF A SELECTED GROUP OF CATTLE RANCHES
IN SOUTHEASTERN MONTANA IN 1924, 1929, 1940 and 1948

| | Year | | | |
|--|---------------|---------------|-------|-------|
| | 1924 | 1929 | 1940 | 1948 |
| Total Acres | 5772 | 5542 | 11914 | 14742 |
| Deeded Acres | 3962 | 3461 | 5532 | 9587 |
| Leased Acres | 1810 | 2081 | 6268 | 5121 |
| Acres Leased From Private Owner | 1492 | 1561 | 1357 | 777 |
| Acres Leased From Public Owner ^{1/} | 318 | 520 | 4911 | 4344 |
| Acres Used Free of Charge | ^{2/} | ^{2/} | 114 | 34 |

^{1/} This does not include National Forest grazing that was secured by permit on a head basis but does include Federal and State grazing district land that was secured by permit on a per head basis. No acreage figures were available in the case of the Forest grazing, but acreage figures were attainable on the grazing districts.

^{2/} No acreage figures were available on free land in 1924 or 1929. This unaccounted acreage for free range represents part of the difference in amount of the total acres of land reported in 1929 and 1940.

Leslie's Script

Disappearance of Free Land

The figures for 1924 and 1929 of the total acreage are deceptive unless the use of the Public Domain and privately owned land used free of charge are considered. During this period a large part of the range used by the ranchers was composed of the Public Domain which belonged to the United States Government and upon which no deeds had ever been granted. Many of the cattlemen using the "open range" had very little if any idea of how much acreage their cattle were running over. Furthermore much of the grazing on the "open range" was done in common with other ranchers' cattle and sheep; therefore no figures as to the amount of free range used during this period were available. The only data available on the use of free range was the number of animal units and the length of time they were grazed on the open range. This was the most important reason for the comparatively smaller size of the ranches in 1924 and 1929.

In June of 1934, the Public Domain was closed to homesteading with the passage of the Taylor Grazing Act. With the passage of this act the free and open range practically disappeared. The land that had composed the Public Domain was turned over to the Grazing Service in the Department of the Interior. The Grazing Service in turn leases this land to the ranchers in the area who were using it before the Act was passed. Where the Public Domain laid in large tracts Federal grazing districts have been established and the range is usually leased on an animal unit basis. Where the Public Domain was broken up by a large number of private holdings, the land was usually leased on an acreage basis with some restriction

being placed on the use of the land. The passage of the Taylor Grazing Act largely explains the increase in the land leased from public ownership in 1940 and 1948 that was shown in Table I.

The free land that existed and was used in 1940 and 1948 was made up of small scattered tracts that were acquired by homesteading. The owners of these tracts have long since left the area but continue to pay the taxes on their land. These tracts are so situated that no one could use them economically other than the rancher whose land surrounds them. Because of this fact the rancher sees no need for leasing, and the owner of the tracts are usually unwilling to sell. About the only conceivable reason for the existence of these tracts is that the owner is holding them for speculative purposes, probably hoping that the land may be overlying a large pool of oil. In 1948 there were only two of these tracts left, both of 320 acres, in the group of ranches studied.

Increase in Deeded Land

The largest increase in total land was found in deeded acreage. As shown in Table II, 19 out of the 21 ranches showed a net increase on the average of 5921 acres each for the twenty-five year period. One of the ranches had a decrease of 460 acres, and one of the ranches, that was surrounded by National Forest, showed no change in deeded acreage. The latter ranch had a land base of 320 deeded acres, all the rest of the land used belonged to the National Forest. The ranch that showed a loss of 460 acres was forced to sell that tract in the drought and depression years. It has not increased in size since because there has never been any

TABLE II. CHANGES IN ACREAGE OF DEEDED LAND OWNED BY TWENTY-ONE CATTLE RANCHES IN SOUTHEASTERN MONTANA, 1924 to 1948

| Year | Changes in Amount of Deeded Land Owned | | | | |
|-----------------|--|-------------------------------|-------------------------|-------------------------------|-------------------------|
| | Increased | | Decreased | | No Change |
| | Number of Ranches | Average Number of Acres | Number of Ranches | Average Number of Acres | Number of Ranches |
| 1924-29 to 1940 | 18 | 2657 | 2 | 875 | 1 |
| 1940 to 1948 | 17 | 4147 | 2 | 2278 | 2 |
| 1924-29 to 1948 | 19 | 5921 | 1 | 460 | 1 |

surrounding land to buy since 1939.

The two ranches that decreased in size during the 1940 to 1948 period did so as the result of the whole unit changing hands. In one case the ranch was divided between two sons, and in the other case the ranch was broken down to make it easier to sell. Both of the ranches that decreased in size between 1929 and 1940 did so as a result of the depression and drought. One of these ranches has since purchased back three times as much land as was lost.

The increased acreage of deeded lands has been through the purchase of lands from a number of sources. The chief source of these purchases has been from unsuccessful homesteaders.

The policy of the government to give 160 acres of land, later increased to 320 and finally to 640 acres, to any one who could exist on the tract for five years resulted in much needless maladjustment in the region. Considering the fact that 125 to 150 animal units of cattle are needed to yield a "minimum comfort" standard of living,^{16/} and that it takes from 35 to 40 acres of range land to support one animal unit in most places within the area^{17/} it is little wonder that the homesteaders soon went broke and had to sell out to some of the larger ranches already existing in the area. A few of the homesteaders were able to stay by buying out other homesteaders.

^{16/} Saunderson, M.H., Readjusting Montana's Agriculture, V. "Economic Changes in Montana's Range Livestock Production," Bul. 311, Feb. 1936, Montana Agricultural Experiment Station, p. 18.

^{17/} Ibid, p. 21.

Several of the ranches in the group being studied were started by homesteading, but at one time or another all but one of them have increased their holdings of deeded land by purchases from unsuccessful homesteaders. These purchases have been made either directly from the unsuccessful homesteader or in many cases from the county. Purchases from the county represent cases where the homesteader's tract went into the hands of the county for delinquent taxes, then was purchased by the successful ranchers in the area. Many of the ranchers were leasing this land from the county in 1940, but had purchased it by 1948. This is the main reason for the decrease in acreage leased from public ownership in 1948.

Another important source of land that accounted for the increase in deeded acreage on some of the ranches was land purchased from the Northern Pacific Railroad. At the time the railroad was built, the government gave the railroad alternate sections for forty miles on both sides of the right-of-way for its distance across Montana. Until the last two or three years much of the railroad land has been leased by the ranchers; since 1946 (for the first time in recent years) the railroad has sold a great deal of this land to the ranchers.

The sales of railroad lands largely accounts for the reduction in the amount of land leased from private owners in the period between 1940 and 1948. The rest of the reduction has been the result of buying small uneconomical tracts, usually from former homesteaders.

TABLE III. LAND USE FACTORS ON A SELECTED GROUP OF
CATTLE RANCHES IN SOUTHEASTERN MONTANA ^{1/}
1924, 1929, 1940, 1948

| Land Use | Year | | | |
|---|-------|------|------|------|
| | 1924 | 1929 | 1940 | 1948 |
| Total Number of Animal Units of Grazing ^{2/} | 462 | 351 | 319 | 428 |
| Acres of Grazing Per Animal Unit ^{3/} | 25.9 | 26.4 | 50.6 | 40.7 |
| Percentage of Land Used for Grazing | 94% | 93% | 95% | 96% |
| Acres of Hay Per Animal Unit | .46 | .78 | .77 | .66 |
| Acres of Crops Per Animal Unit | .70 | .84 | .85 | .73 |
| Percentage of Land Used for Crops | 6% | 7% | 5% | 4% |
| Percent of Land Used for Crops Other Than Hay | 2.04% | .51% | .45% | .40% |

^{1/} Based on twenty-one ranches located in Carter, Custer, Musselshell, Powder River, Prairie, and Rosebud Counties.

^{2/} An animal unit of grazing represents twelve months of grazing per year by one animal unit.

^{3/} In the case of the free range in 1924 and 1929, and the National Forest in all of the years, no acreage figures were available; however, data was available as to the number of animal units of grazing obtained from these sources, and these animal units have been deducted from the total animal units in figuring acres of grazing per animal unit.

Land Use - Grazing Land

In view of the large increase in acreage owned and controlled, the next important question to consider is - has there been any important changes in the use of the land by the ranchers?

The most noticeable change in land use during the period 1924-1948 is the decreased rate of stocking on the range land. As shown in Table III, in 1924-29 the rate of stocking, (after allowances for animal units 12 months of grazing on free land had been deducted), was about one animal unit to 26 acres. In 1940, the amount of grazing land per animal unit had almost doubled. In 1948, the rate was 40.7 acres per animal unit, a decrease from the 1940 rate but still an increase of 64% over the 1924-29 rate.

In considering the rate of stocking in 1924-29 two important factors should be considered. In the 1924-29 period, the figures given represent the stocking rate on the owned and leased lands only. The second factor to be remembered is that a large amount of grazing was done on the open range and in most cases the rancher had only a rather sketchy idea of how much grazing his stock did do on free land and an even fainter idea of the amount of land his stock were actually grazing. For these reasons the figures given for 1924 and 1929 are not fully accurate.

The important factor concerning grazing in the days of the open range was that most of the ranchers were trying to run more cattle than they had grass with which to feed them. This condition was brought about by the fact that ranchers had the tendency to run all the cattle on the

