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## Ranching in Northwestern South Dakota

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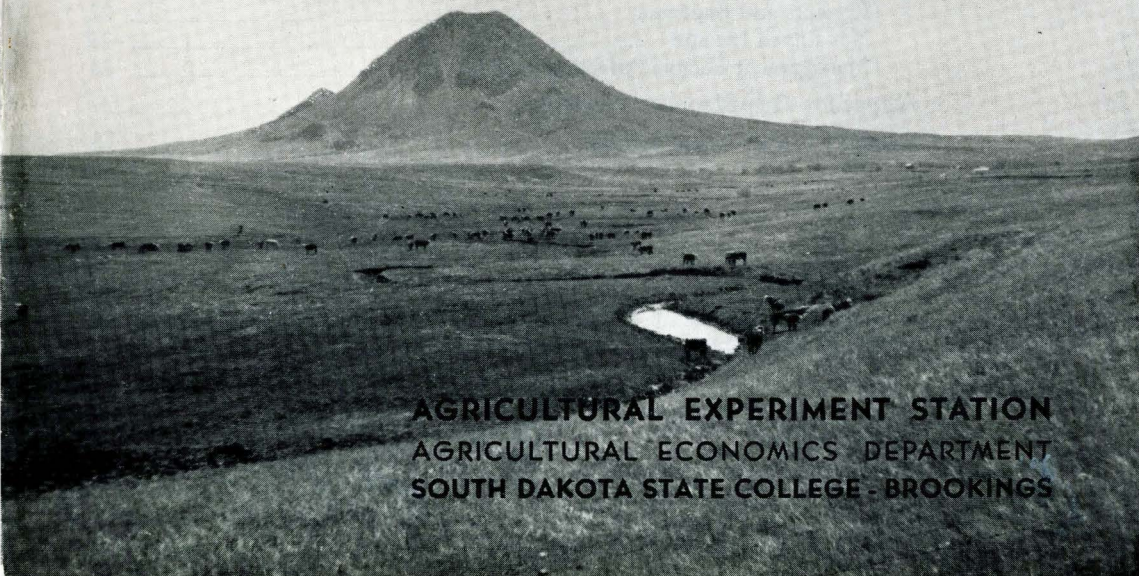
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# NORTHWESTERN SOUTH DAKOTA



**AGRICULTURAL EXPERIMENT STATION  
AGRICULTURAL ECONOMICS DEPARTMENT  
SOUTH DAKOTA STATE COLLEGE - BROOKINGS**



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**Cover Picture.** Bear Butte in Meade county is a familiar landmark in western South Dakota, an area where large cattle ranches predominate.

# Ranching in Northwestern South Dakota

By C. R. HOGLUND and M. B. JOHNSON<sup>1</sup>

## Introduction

Ranch size, organization, and management have changed greatly in the entire South Dakota range area the past 25 years. The average ranch size increased from 897 acres in 1920 to 1,671 acres in 1945. In the four Northwestern counties studied, average ranch size increased from 921 acres to 2,188 acres during the same 25 year period (figure 1). The percent of ranches 1,000 acres and over in size, doubled from 1930 to 1940.

Along with increases in size have come adjustments to more beef cattle and sheep and less dairy cattle, hogs and acres in crops. Sheep numbers reached an all time high in 1943, but have been drastically reduced since that date, due chiefly to labor shortages and parasites. Total cattle numbers in the range area are about equal to the high point in 1934, but the number of cows kept for milk are the lowest in 20 years. Horse numbers have been reduced by 50 percent the past ten years thereby making it possible to graze more cattle and sheep.

The 1945 numbers of roughage consuming animal units (cattle, sheep and horses) in the entire range area was 95 percent of the ten year average pre-drought period, 1924-33, and 81 percent of the high point reached in 1934.

Acreage in cropland in the entire range area was reduced by over 1,000,000 acres from 1930 to 1945. Most of this acreage was either seeded to permanent grasses such as crested and western wheat grass or was allowed to revert back to grass without any special attention.

Under favorable prices and weather conditions, the planted acreage of crops in 1944 and 1945 increased 20 percent over the pre-war period. This was accomplished chiefly by a fuller use of existing cropland previously reported as idle and fallow. However, the plowing up of some grassland, particularly during 1945 and 1946, has added to the cropland acreage.

Ranch income in the range area has fluctuated greatly during the past few years. Some ranchers weathered the drought period during the 30's reasonably well, while others had considerable difficulty. Many ranchers were forced out of business entirely during the period from 1933 to 1940. Operators of inadequate sized or poorly organized ranches received low incomes even during recent favorable war years. Most operators with little livestock and dependent on cash grain sales have fared poorly in the past.

<sup>1</sup>Associate Economist, South Dakota Agricultural Experiment Station and Economist, Bureau of Agricultural Economics, United States Department of Agriculture, respectively.

The range area comprises about 45 percent of the total farmland area in the state (figure 2). The 1945 U. S. census reports that 27 percent of all cattle and 48 percent of all sheep are in the range area. Total value of livestock and crop products sold in the range area during 1944 accounted for about one-seventh of the total value for the state.

This ranch study was undertaken jointly by the South Dakota Agricultural Experiment Station and the Bureau of Agricultural Economics, United States Department of Agriculture, during the fall of 1945. It included an over all study of the South Dakota range area with a more detailed study in the four Northwestern counties. An analysis was made of 1,086 ranch record sheets from the County Agricultural Conservation Associations. More detailed ranch information was obtained by a survey of 84 representative ranches visited in the four counties.

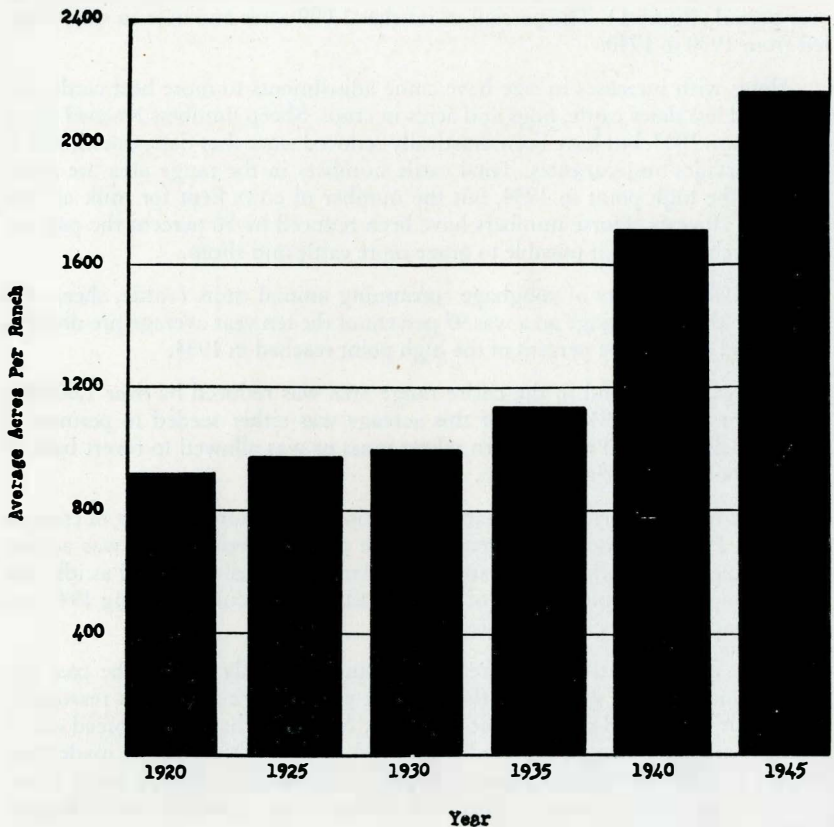
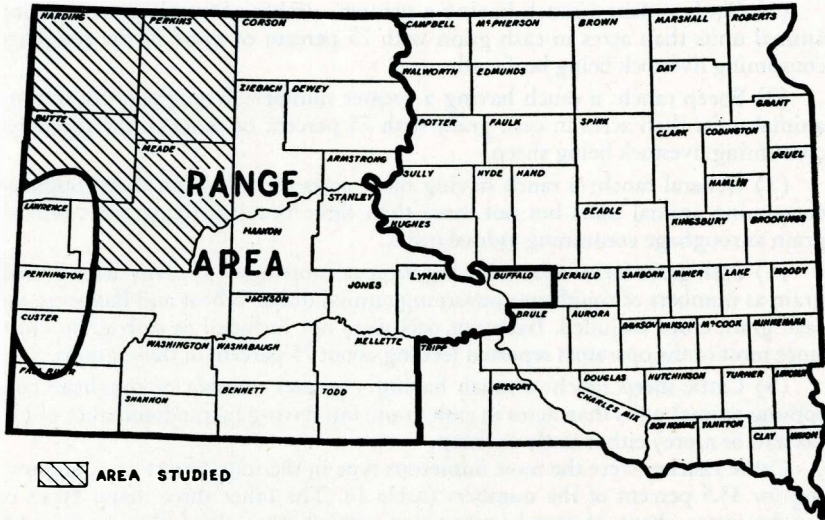


Figure 1. Average ranch size more than doubled from 1920 to 1945 in the four northwestern counties of the state.



THE RANGE AREA COVERS 45 PERCENT OF THE FARMLAND AREA OF THE STATE. TWENTY-SEVEN PERCENT OF ALL CATTLE AND 48 PERCENT OF ALL SHEEP IN THE STATE WERE IN THE RANGE AREA, JANUARY 1, 1945.

## Purpose of Study

### Objectives

The chief objectives of the study were:

- (1) To determine the general situation regarding ranch organization and ranch distribution by size and type.
- (2) To determine the livestock and crop management practices used by ranchers in the area studied.
- (3) To determine amount of investment, extent of mechanization, and labor requirements for the different types of ranches.
- (4) To determine net ranch income and to measure the relationship between efficient management and income.
- (5) To evaluate the adjustment problems that ranchers in the area may face in the future.

### Kinds of Ranches Studied

The four Northwest counties of the state, namely, Butte, Harding, Meade and Perkins, were chosen for this study because of the presence of four distinct types of ranches which are important in the range area. The four types of ranches studied were cattle, sheep, general, and cash grain. A fifth type found in the area was a combination cattle-sheep ranch. The ranches were classified into these types on the basis of the ratio of roughage consuming livestock to acres of cash grain. Briefly, the method used in classifying the ranches was as follows:

(1) Cattle ranch: a ranch having a greater number of roughage consuming animal units than acres in cash grain with 75 percent or more of the roughage consuming livestock being beef cattle.

(2) Sheep ranch: a ranch having a greater number of roughage consuming animal units than acres in cash grain with 75 percent or more of the roughage consuming livestock being sheep.

(3) General ranch: a ranch having more acres of cash grain than roughage consuming animal units but not more than three times as many acres of cash grain as roughage consuming animal units.

(4) Cash grain farm: a farm having three or more times as many acres in cash grain as numbers of roughage consuming animal units. Wheat and flax were the cash grain crops included. Barley or oats were not included as cash grain crops since most of the operators reported feeding about 75 percent of these grains.

(5) Cattle-sheep ranch: a ranch having a greater number of roughage consuming animal units than acres in cash grain, but having no predominance of (75 percent or more) either cattle or sheep.

Cattle ranches were the most numerous type in the four-county area, accounting for 33.5 percent of the numbers (table 1). The other three major types of ranches were about of equal importance, contributing the following percentages: sheep, 19.5; general, 18.5; and cash grain, 21.6. Only seven percent of the ranches in the area were classed combination cattle-sheep units. This latter group of ranches was not studied due to the small number in the area.

### Method of Study

Information on numbers and classes of livestock, acres in crops and grazing land and kinds and sizes of ranches for the four county area studied was obtained from a 50 percent sample from county AAA records. More detailed ranch information was obtained by survey schedules from a selected sample from the AAA records. This sample was chosen to represent the types and sizes of ranches found in the area.

Survey records were obtained during October and November of 1945 from 84 ranchers in the four northwestern counties of the state. The record information covered the 1944 ranching operations as well as information on normal and future management practices. Twenty-four cattle, 24 sheep, 18 general, and 18 cash grain ranchers were visited. These four types of ranches were divided into the following five size groups; ranches with

- (1) Less than 51 roughage consuming animal units<sup>2</sup> or acres cash grain.
- (2) 51-100 roughage consuming animal units or acres cash grain.
- (3) 101-200 roughage consuming animal units or acres cash grain.
- (4) 201-400 roughage consuming animal units or acres cash grain.
- (5) 401 and over roughage consuming animal units or acres cash grain.

Survey records were obtained from all five size groups with the exception of the general ranches where the large size (401 and over) group was not sampled. The material for the section entitled "Principal Characteristics of the Area" was obtained chiefly from the four county AAA offices and the U. S. Census.

<sup>2</sup>A roughage consuming animal unit is here considered equivalent to one mature cow, two other cattle or five mature sheep.



Table 1. Percentage Distribution of Ranches by Size and Type Four Northwestern South Dakota Counties, 1944. (Date from 50% sample of AAA county records)\*

Size of Group No. of animal units or acres of cash crops	Cattle		Sheep		Type of Ranch General		Cash Grain	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
50 and under .....	116	29.7	37	16.3	122	56.5	29	11.5
51—100 .....	119	30.4	55	24.2	68	31.5	60	23.8
100—200 .....	99	25.3	71	31.3	20	9.2	75	29.8
201—400 .....	48	12.3	53	23.3	5	2.3	59	23.4
400 and over .....	9	2.3	11	4.9	1	.5	29	11.5
Total Numbers .....	391		227		216		252	
% of all ranches .....		33.5		19.5		18.5		21.6

\*This information was taken from every other operator's work sheet for 1944. The irrigated area in Butte and Meade counties was not included in the study.

## Principal Characteristics of the Area

### Land Use

Rainfall, soil type and topography have been major factors determining land use in the area studied. Normal annual rainfall, based on long time records in the area, has averaged somewhat over 14 inches. Rainfall during 1944 averaged over 19 inches, five inches above normal.

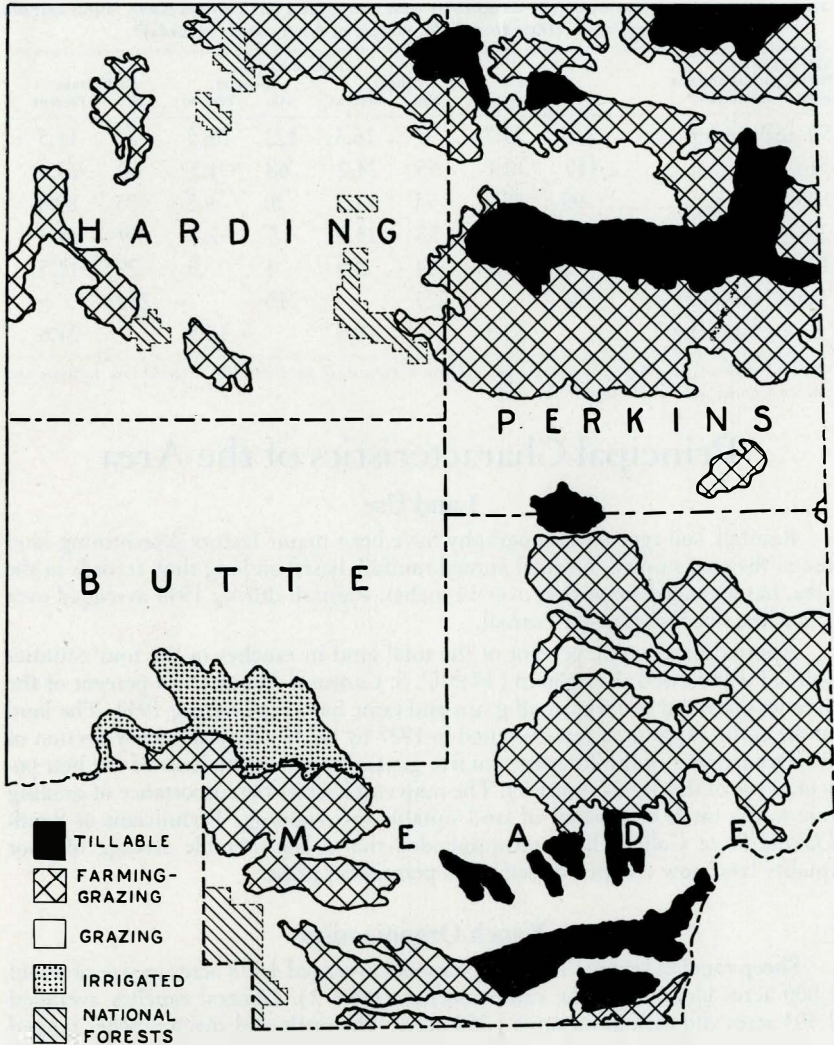
Approximately nine percent of the total land in ranches in the four counties studied was classed as cropland (1945 U. S. Census). About seven percent of the area was devoted to corn, small grain and tame hay crops during 1944. The land in the entire range area was classified in 1927 by the Geological Survey Section of the Department of the Interior into five general types on the basis of the best potential use of this land (figure 3). The map emphasizes the importance of grazing due to the small proportion of land suitable for cropping. Technicians at South Dakota State College have recommended that a considerable acreage of poor quality land now cropped be seeded to permanent grass.

### Ranch Organization

**Sheep ranches largest.** The sheep ranches averaged 4,178 acres in size or about 1,000 acres larger than the cattle ranches (table 2). General ranches averaged 1,403 acres and cash grain units 1,150 acres. The cattle and sheep ranches ranged in size from a few as small as 320 acres to several larger than 20,000 acres. The general ranches ranged from 240 to 5,000 acres and over. Most of the cash grain units ranged from 240 to 4,000 acres. Approximately 20 percent of the ranches in the area studied are below one section (640 acres) in size.

**Acres in crops.** Acres in crops during 1944 averaged 333 acres on the cash grain ranches, 243 acres on the general ranches, and somewhat over 100 acres on the cattle and sheep ranches (table 2). Over two-thirds of the acreage in crops on the cash grain units was wheat, compared to somewhat less than one-half on the general ranches. Very little wheat was produced on the sheep or cattle ranches.





## THE FOUR COUNTY AREA STUDIED IS BEST SUITED FOR GRAZING

**Livestock numbers.** Very few cattle ranches kept sheep, but most sheep ranchers kept a few cattle. The general rancher averaged about 50 head of cattle and 50 head of sheep per ranch. However, most of the general ranchers kept only sheep or cattle although a small percentage kept both classes of livestock. The sheep ranches

averaged about 40 percent more units of roughage consuming livestock than did the cattle ranches on the basis of five sheep or one mature head of cattle equalling one animal unit. The general ranchers kept about half as many roughage consuming livestock as did the cattle rancher.

A relatively small number of livestock was kept on the cash grain units. The general rancher kept about twice as many roughage consuming animal units as did the cash grain farmer. The general ranchers raised more hogs than any of the other three types of ranchers. Practically no hogs were raised on the sheep ranches.

Table 2. Average Ranch Organization, by Type of Ranch Four Northwestern Counties, 1944  
(Data from 50% sample of AAA county records)\*

Item	Cattle	Sheep	Type of Ranch	
			General	Cash Grain
Acres operated .....	3,157	4,178	1,403	1,150
Grazing .....	2,928	3,983	1,075	737
Crops .....	135	102	243	333
Number of				
All cattle .....	122.4	15.8	51.4	26.1
Milk cows .....	4.6	2.6	4.6	3.3
All sheep .....	9.7	791.4	49.5	14.8
Sows .....	2.0	.5	3.6	2.8
Animal units				
Roughage consuming† ..	124	175	61	29
Grain consuming‡ .....	3	1	7	4

\*This information was taken from every other operator's work sheet for 1944. The irrigated area in Butte and Meade counties was not included in the study.

†One mature head of cattle, 2 other cattle or 5 mature sheep equal one roughage consuming animal unit.

‡Includes hogs and poultry; 5 hogs or 100 chickens equal one animal unit.

## Ranch Investment

The total investment for cattle and sheep ranches visited averaged slightly over \$21,000 (table 3).

The general rancher had an average investment of \$16,466 compared to \$10,753 for the cash grain operator. The investment in land was highest for the sheep ranches due to the larger acreage of land owned. The livestock investment was the highest for the cattle ranches.

Value of ranch improvements was twice as high on the sheep as on the cash grain unit. A minimum of buildings are needed on cash grain farms as very little shelter is needed for livestock. Machinery and equipment investment was about \$1,000 higher on the cash grain farms than on the cattle or sheep ranches.

Investment figures for land, improvements, machinery and equipment were supplied by the ranchers themselves. These figures were in most cases conservative and below 1945 sale values. The livestock investment was calculated by multiplying average numbers by the following values: bulls, \$200; calves, \$35; all other cattle, \$60; sheep, \$7; and hogs, \$35. Values of crops on hand were determined by using the following prices: corn, \$1.00; wheat, \$1.30; oats, \$0.50; barley, \$0.80; and rye, \$0.80 per bushel; and hay \$5.00 per ton.

Table 3. Average Investment by Type of Ranch, 1944

Number of ranches	Cattle 24	Sheep 24	General 18	Cash Grain 18
Land owned .....	\$ 6,503	\$ 7,498	\$ 4,950	\$ 4,015
Improvements .....	3,964	4,887	3,673	2,055
Livestock .....	7,880	5,968	3,599	1,415
Crops .....	1,457	1,680	1,998	777
Machinery and equipment .....	1,415	1,508	2,246	2,491
Total Investment .....	\$21,219	\$21,541	\$16,466	\$10,753
Value of Leased Land .....	\$ 6,022	\$ 6,900	\$ 7,146	\$ 5,053
Total value of ranch unit including rented land .....	\$27,241	\$28,441	\$23,612	\$15,806

## Mechanization

**Machines used.** A large proportion of all ranchers surveyed owned tractors (table 4). This was particularly true for the general and cash grain operators. About a third of the cash grain farmers owned trucks compared to half this proportion on the other three groups of ranches. The pickup was most important on the sheep outfit where it is used quite extensively in hauling feed and supplies. Trailers and combines were found most frequently on the general and cash grain units. Power mowers have become more important in recent years, and were found on about half of the ranches. Over two-thirds of the ranchers used buck rakes. Power stackers were found frequently on the cattle and sheep units.

**Greater mechanization expected.** Most of the ranchers interviewed indicated a desire to add some new machines or replace some old ones with more modern machines. About one-fourth or more of all four types of ranchers expect to add

Table 4. Percent of Ranchers Owning Most Common Machines, By Type of Ranch, 1944

Item	Percent of ranchers owning machines			
	Cattle	Sheep	General	Cash Grain
Tractor .....	58	75	100	89
Truck .....	17	14	15	33
Pickup .....	34	66	6	34
Trailer .....	23	34	59	45
Combine .....	5	19	56	46
Mower, power .....	45	56	70	38
Mower, horse .....	69	71	79	62
Buck rake .....	61	78	95	66
Other rake .....	74	75	78	36
Stacker, power .....	13	11	19	8
Stacker, horse .....	23	36	12	4



newer types of tractors. Most sheep and cattle ranchers indicated a desire to purchase the smaller two bottom, all purpose tractor that could be used for haying and other ranch operations. A need for the larger size tractor was expressed by the general and cash grain operators.

Power stackers and power mowers were desired by a high proportion of cattle, sheep, and general ranchers. About one out of every eight cattle and sheep ranchers expected to purchase buck rakes. Over a third of the general and cash grain operators expect to add combines. Other machines that ranchers are thinking about buying are pickups, trucks, manure loaders, manure spreaders, power binders, corn pickers, windrowers, pickup balers, one-way discs and other tractor operated machines.

## Labor Supply Requirements

**Cattle ranchers older.** Operators of cattle and sheep ranches average from six to ten years older than the operators of the general and cash grain units. This is probably due to the higher proportion of early settlers that still operate cattle and sheep ranches. Many of these ranchers may also have started out as general or cash grain operators and have since shifted to cattle or sheep ranching. About 60 percent of the cattle and sheep operators visited have operated the same ranch 30 or more years. Only 25 percent of the cash grain operators have been on the same farm that long. The hired labor requirements for the older operators average somewhat higher than for the middle age operators due to (1) larger ranches operated, and (2) less family labor left on the ranches.

**Sheep labor requirements high.** The sheep ranchers used 50 percent more labor during 1944 than did any of the other three types of ranchers (table 5). The sheep rancher used more of both family and hired labor than did the others. Under normal conditions about half of the total labor used on sheep ranches with 1,000 or more sheep, and a third of the total labor on the cattle ranches with 200 or more cattle is hired.

Table 5. Average Months of Labor Used, 1944, and Future Needs by Type of Ranch

	Type of Ranch			
	Cattle	Sheep	General	Cash Grain
<b>Age of operator</b> .....	<b>57.3</b>	<b>53.4</b>	<b>46.6</b>	<b>47.0</b>
<i>Months of man equivalents per year</i>				
Family labor				
1944 .....	15.3	20.3	17.1	13.2
Future needs .....	15.7	19.5	19.4	15.6
Hired labor				
1944 .....	2.2	6.3	2.1	3.0
Future needs .....	3.7	9.9	5.6	3.3
Total labor				
1944 .....	17.5	26.6	19.2	16.2
Future needs .....	19.3	29.3	25.0	18.5

**More labor needed.** All four types of ranchers indicated a need for more labor. The sheep and general ranchers stated that they would need at least three additional months of hired labor per year. About a month and a half of extra hired labor would be needed by the cattle operators. Many of the sheepmen indicated a need for additional year-around help.

## Land Ownership and Tenure

**Land leased.** Over half of the total land operated by the sheep and general ranchers was leased (table 6). Somewhat less than half of the land on the other two types of ranches was leased during 1944. The high proportion of land formerly leased has been reduced in recent years because operators have bought considerable acreage since 1939. The sheep ranchers purchased an average of more than 800 acres of land at an average price of \$2.08 an acre during the six year period 1939-44. The cattle and general ranchers purchased an average of somewhat over 500 acres each with the cash grain farmers purchasing about 300 acres. Average prices paid by the cash grain farmers was about \$5.00. The higher price paid by the cash grain farmer was due to the higher proportion of cropland included in the purchase.

**Table 6. Average Acres Operated and Leased, Acres Purchased Since 1939, and Percent of Ranchers Preferring to Own All Land or Own Part and Lease Part**

	Cattle	Type of ranch		Cash Grain
		Sheep	General	
Total Acres Operated .....	3,572	4,429	1,998	1,205
Leased land				
Acres .....	1,692	2,301	1,191	383
Percent .....	47	52	60	42
Land purchased since 1939				
Acres .....	525	841	533	310
Price per acre .....	\$2.04	\$2.08	\$3.19	\$4.88
Percent of ranchers preferring				
To own all .....	13	44	54	62
Own part, lease part .....	87	56	46	38

**Leasing versus ownership.** A majority of the cattle and sheep ranchers said they preferred to own their headquarters, and to rent a considerable portion of the grazing land. The other two types of ranchers showed a higher preference for owning all of their land. The chief reasons given by those preferring to own all their land were: (1) greater security, (2) as cheap to own as rent, and (3) benefit from improvements made. The ranchers preferring to own part and lease part of the land felt that (1) it was cheaper to rent than own their land, and (2) less capital was required.

The sale of county land has tended to change the entire land ownership pattern in the range area in recent years. Ranchers in the counties studied indicated rapid sale of county owned land at prices mostly from one to two dollars per acre. Somewhat over 145,600 acres of county land was reported sold during 1945 in the four

counties studied. At the beginning of 1946 there still remained to be sold over one million acres of county land in these four counties. In addition to this, the State of South Dakota owns and leases to ranchers about 826,000 acres of school and endowment lands in these counties. Apparently most of this land is being purchased by the ranchers who have previously leased it. However, there is evidence of increased purchases by non-resident buyers for investment or speculative purposes.

## Ranch and Range Management Practices

### Grazing Practices

**Summer and winter pastures used.** One of the important developments in range livestock production during recent years has been the separation of the range into a number of pastures, particularly the separation into summer and winter pastures where formerly the entire range was grazed throughout the year. On a majority of the ranches about one-third of the range is set aside for winter and early spring grazing. The most common date for turning cattle on winter pastures is December 1 to January 1, and on summer pastures April 1 to May 1. Most sheep ranchers begin using winter pastures during November and December, with the summer grazing season usually starting in late May or early June.

Fifteen percent of the cattle and sheep operators reported using an average of 95 acres of crested wheat grass. These crested wheat grass pastures provide a month to six weeks earlier pasture, thus delaying the grazing of the native range until the grass has made a good growth. Many of the cattle and sheep ranchers provide crested wheat grass for calving and lambing pastures. This provides early grass which boosts the milk flow when it is needed most.

**Rotation grazing practiced.** On about two-thirds of the sheep ranches summer pastures are divided into three or more units which are used in rotation. Rotation grazing was practiced by only one of the 24 cattlemen visited.

**Breeding pasture used.** Twenty-four percent of the cattlemen reported using breeding pastures. Ranches using breeding pastures report this as a good practice in insuring high calf crops. Such pastures need only be large enough to provide grazing for the breeding herd for a period of six to ten weeks. Breeding pastures should preferably be located on level or gently rolling land. Small pastures reduce the chance of bulls becoming separated from the cow herd.

### Stock Water Development

**More reservoirs built.** Another important improvement in the range country during recent years has been an increase in stock water development. A large number of stock water reservoirs have been constructed, particularly under the impetus of the Agricultural Conservation Association and the Soil Conservation Service range programs. About 80 percent of the cattle, sheep, and general ranchers reported having reservoirs. Many such reservoirs strategically located have materially increased the carrying capacity of the range area. They have also resulted in a more uniform utilization of the range resources than was possible when stock water was confined to natural creeks, rivers, and springs.

**Large reservoirs satisfactory.** The consensus seems to be that stock water reservoirs to be satisfactory as a dependable source of water supply should be large and deep. This is particularly important during seasons of low rainfall when the



reservoirs are replenished infrequently by rain. Under such conditions water in small reservoirs becomes stale, and in some cases such small ponds are little more than mud holes.

**Leasing practices affect dam construction.** Some of the ranchers pointed out the problems involved in water development on leased land. The best utilization of leased land often hinges on the possibilities of building satisfactory dams. A few ranchers indicated that present leasing terms do not protect the stockmen against loss in investment in dams. Some of these leases do not provide for future lessees or purchasers to pay the unexhausted value of dams. However, the State Department of School and Public Lands and many counties in the western part of the state do provide for the oncoming tenant or owner to pay for dams constructed by the previous tenant. In most cases it is necessary for the lessee to obtain a permit before constructing a dam on this rented school or county land.

### **Other Conservation Practices**

A large proportion of the ranchers visited carried on other conservation practices. About 40 percent of the ranchers have seeded some crested wheat grass to provide additional hay and pasture. In many cases this seeding was done on the lower grades of cropland.

Strip cropping was practiced on one out of eight ranches visited. Most of the operators who practice strip cropping felt that this practice would reduce some of the hazards of crop production. A few ranchers have contour furrows on the grazing land. The practice of irrigating hayland is becoming more popular. Spring development, shelter belt plantings, fire-break development, and grasshopper control are other conservation practices used.

### **Winter Feeding**

**Year-long grazing practiced.** Profitable range livestock production is based on a system of year-long grazing involving the greatest possible use of the native range forage in the production of beef, lamb and wool. However, supplementary winter feeding is necessary throughout the range area. The amount of feeding required varies from year to year as well as between individual ranches. Even during the most favorable years and on the best located ranches, some feeding is necessary to condition bulls for the breeding season, and to maintain aged cows in thrifty condition.

The feeding season commonly starts late in the fall or early winter, and may continue throughout the winter season. Feed requirements and the length of the feeding season are determined by (1) quality of grass in winter pastures, (2) severity of the weather, (3) natural shelter in winter pastures, (4) condition of livestock in fall and composition of the herd.

**Feeding period.** The length of the feeding period varies from year to year and between ranches. The average for the ranches in the open unprotected areas is about 120 days, while in the rough broken areas, the average is about 75 days.

The amount of hay fed annually varies from as little as one-fourth ton or less to more than one ton of hay per mature animal unit. An average of about 100 pounds of cottonseed or soybean cake or its equivalent feeding value in corn, oats, or barley is also fed per animal unit of cattle. A smaller proportion of hay and more protein supplement are ordinarily fed to sheep. Practically all of the cattle and

sheep ranchers fed either protein supplement or grain or both during the 1944-45 winter feeding period. Under less severe winter conditions many of the cattlemen would feed little or no supplementary feed.

**Winter feeding expensive.** Winter feeding is expensive in the range country, particularly in dry years if feed other than concentrates must be shipped in. Past experience has convinced stockmen that feed reserves are necessary to bring them through the seasons when no feed is produced. Sheepmen spent an average of about \$1,000 per ranch for feed during 1944.

During recent years a few stockmen have made a practice of windrowing or bunching a portion of their hay crop and leaving it on the ground to be fed by turning the livestock into the meadows during the feeding season. This practice has the advantage of eliminating the labor of stacking the hay, and hauling it from the stacks to winter pastures and feeding it. It has the disadvantage of lowering the quality of hay, increasing the waste, necessitating the moving of livestock from winter pastures to hay meadows, and back to winter pastures during stormy weather.

### **Livestock Marketing**

**Shipping to terminal public markets.** Forty-five percent of the ranchers visited make a practice of shipping some or all cattle sold to terminal public markets. About one-third of the cattlemen sell direct to feeders. For the area as a whole about 27 percent of the cattlemen reported selling through livestock auctions. Ranchers in the Belle Fourche area indicated that a majority of cattle are sold through the local auction.

**Sheep marketing.** About two-thirds of the sheep sold on the range go direct to feeders. The balance sold on the range are purchased by dealers. Very few sheep are shipped or marketed through sales rings.

**Age and classes of cattle marketed.** Only a small proportion of cattlemen have a definite policy regarding the age at which steers are marketed each year. The classes of cattle sold on an individual ranch are usually governed by the market demands, suitability of the individual ranch for the production of certain classes of cattle which may vary from year to year depending on available feed supplies, and the availability and cost of labor.

Sixty-eight percent of the cattlemen reported selling yearling steers, 32 percent reported selling two-year old steers and only nine percent reported selling three-year old steers during 1944. Somewhat over one-third of the cattlemen sold calves. A majority of cattlemen reported selling cows and about half reported selling yearling heifers. Cull two-year heifers were sold by 18 percent of the cattlemen. All cattle ranchers reported selling more than one class of cattle.

## **Cattle Range Organization and Management**

### **Numbers and Classes of Cattle**

**Little evidence of overstocking.** The cattle ranches visited in Northwestern South Dakota had an average of 121 head of cattle of all ages in 1944. Some ranches are stocked up to or above the estimated normal carrying capacity of their grazing land, while others are understocked. The operators visited indicated that for the area as a whole there was sufficient grass for present cattle numbers for the immediate years ahead.

The ranchers interviewed are planning on increasing the numbers per ranch from the present 121 to 139 head, or about 15 percent, during the next few years (table 7). Most of these increases are expected to take place on the ranches with less than 200 head of cattle. This anticipated increase in number of cattle per ranch is expected to be accompanied by a decrease in the number of ranches and does not imply a corresponding increase in total cattle.

**Table 7. Average Numbers and Classes of Cattle Per Ranch, Beginning and End of Year, 1944, and Future Anticipated**

Class of cattle	1944 average	Future anticipated	Percent future is of 1944
Cows .....	65.4	71.3	109.0
Heifers, two's .....	9.6	14.5	151.0
Heifers, one's .....	17.2	22.0	127.9
Calves, 1-12 mo. ....	1.8	1.7	94.4
Steers, one's .....	18.1	22.2	122.7
Steers, two's .....	5.1	4.5	88.2
Steers, three's .....	2.0	1.2	60.0
Bulls .....	2.2	2.4	109.1
Total .....	121.4	139.7	115.5

The anticipated increase by classes of cattle will be largest in two year old heifers, followed by yearling heifers and yearling steers with a reduction in two and three year old steers. The proposed increase in two year old heifers is enough to bring heifer numbers up to 20 percent of the cow numbers. This number will permit culling cows out of the breeding herd at eight or nine years of age, depending on the percentage of death loss sustained and assuming that heifers are bred to calve at three years.

**Yearlings may increase.** Records indicate that there will be an increase in yearling steers and heifers and a decrease in two and three year old steers. This trend is common throughout the range country. In spite of this trend a few ranchmen who have sold calves and yearlings in the past propose to sell two and three year old steers in the future. Their reasons for this policy are that they can handle a given number of cattle with less labor and with less expense for winter feed if steers are kept until two or three years old than if sold at younger ages with the necessary increase in the breeding herd to stock the ranch to its full carrying capacity.

### **Cattle Management Practices**

**Breeding season.** The length of breeding season varies between ranches, running from ten weeks to year-long with an average of six months for all cattle ranchers visited. Where bulls are separated from the cow herd for part of the year, they are turned in with the cows during June or early July, the latter date being most common.

A short breeding season results in a more uniform calf crop than when the breeding is spread over a six month period. Where year-long breeding is practiced



there are always a number of late calves to add to the ranchman's troubles when winter sets in.

Many ranchmen make a practice of shipping late calves and cows rather than wintering them. However, other ranchmen believe that a dry cow brings more money than a wet cow and late calf. A few stockmen believe that a short breeding season cannot produce high calf crops. However, the experiences of other stockmen indicate that the use of breeding pastures, enough bulls and a breeding herd in thrifty condition are more important factors than a long breeding season in obtaining high calf crops.

**Management practices vary.** All of the cattlemen visited indicated using purebred sires (table 8). The cattlemen reported selling cull cows when they reached an age of seven to ten years. However, non-breeders and poor producers were often sold at an earlier age. Normal death loss averaged 3.5 percent, ranging from two to six percent of the breeding herd. The number of calves raised per 100 cows kept averaged about 82 in 1944. A few cattlemen had calf crops as low as 60 percent with others as high as 96. Over half of the cattlemen reported heifers bred as yearlings. Many of these ranchers expressed the belief that this was a poor practice. None of the cattle ranchers reporting yearling heifers bred were using breeding pastures. Only 25 percent of the cattlemen, with most of these having 100 or more cattle per ranch, were using breeding pastures.

Table 8. Cattle Management Practices

Item	Average	Range
Percent using purebred bulls, 1944 .....	100.0	-----
Normal age of cows culled, years .....	9.5	7-10
Normal percent death loss .....	3.5	2-6
Percent calf crop, 1944 .....	82.1	60-96
Percent breeding yearling heifers .....	48.9	-----
Percent using breeding pastures .....	25.0	-----
Percent shifting from sheep to cattle .....	15.5	-----

**Increasing the calf crop.** The factors of greatest importance in securing a high calf crop, in the opinion of ranchmen, are (1) good condition of the breeding herd during the breeding season, (2) the use of breeding pastures, (3) the use of riders in large pastures to keep the bulls distributed, (4) freedom from Brucellosis (Bangs disease) and (5) in not breeding yearling heifers. Causes of low calf crops as reported by ranchmen are given in table 9.

Table 9. Causes of Low Calf Crop

Major cause	Percent of ranchers reporting
Poor conditions of breeding herd .....	33
Breeding yearling heifers .....	28
Poor distribution of bulls .....	17
Hard winter, poor quality feed .....	11
Bad weather at calving time .....	11
Other causes .....	9

In addition to the causes listed in the table, Brucellosis is an important cause of low calf crops on ranches where the disease is prevalent. Fortunately, relatively few herds in the South Dakota range area are infected with this disease.

**Reducing death loss.** Breeding yearling heifers is one of the important causes of low calf crops, and is also the principal cause of death loss in the breeding herd (table 10). Lightning, poisonous plants, bloat, septicemia and accidents were given as other major causes of death loss. Most ranchers reported more than one cause of death loss on their ranches.

Table 10. Causes of High Death Loss in Cattle Herds, Normal

Major cause	Percent of ranchers reporting
Heifers calving .....	42
Lightning .....	33
Poisonous plants and bloat .....	33
Septicemia and other similar ailments .....	25
Accidents .....	17
Others .....	16

**Vaccination important.** Preventive measures taken by ranchmen against death losses from disease include the almost universal practice of vaccinating against blackleg. Vaccination against anthrax is practiced wherever an outbreak occurs. Vaccination against hemorrhagic septicemia is less common. Calftooth vaccination against Brucellosis is practiced on a few ranches where outbreaks of this disease have occurred. In the opinion of some ranchmen, coccidiiosis and similar ailments are sometimes mistaken for hemorrhagic septicemia, and the unfavorable results from septicemia vaccination in such cases can be laid to incorrect diagnosis of the disease.

## Sheep Ranch Organization and Management

### Composition of Breeding Flock

**Older ewes kept.** Most ranchers visited reported a much higher proportion of aged ewes in their breeding flock than was normal. The practice of holding over ewe lambs for replacement purposes was largely discontinued in 1944 due to a general reduction in sheep numbers. Many of the ranchers were selling the entire lamb crop with the expectation of purchasing yearling ewes for replacement purposes the following spring.

**Larger flocks reduced.** Total sheep numbers averaged about 800 head per ranch for both the beginning and end of 1944 (table 11).

An average of 94 sheep were purchased during the year. Future sheep numbers are estimated to remain about the same as they were during 1944. However, the ranchers with 1,000 or more head expect to reduce their numbers by ten percent while the ranches with less than 500 head expect to increase their number by 20 to 35 percent.

Table 11. Average Sheep Inventories, 1944, and Future

Item	Number	Range
Number of ranches	24	
Sheep per ranch January 1, 1944 .....	823	158-2700
Lambs born per ranch .....	595	130-1900
Sheep and lambs purchased per ranch .....	94	0-600
Sheep and lambs sold per ranch .....	611	120-2212
Sheep and lambs butchered per ranch .....	1	0-6
Sheep died or lost per ranch .....	34	15-150
Lambs died or lost per ranch .....	71	10-409
Sheep per ranch December 31, 1944 .....	801	175-2450
Future anticipated sheep numbers .....	821	200-2500

### Sheep Management Practices

**May lambing predominates.** The majority of the larger sheep ranchers breed their ewes to lamb during May. Over 80 percent of the smaller operators plan on lambing during April. Practically all of these use lambing sheds. Many of the sheepmen make it a practice to limit the breeding season to six weeks or less to insure more uniform lambs. The later lambs are often less thrifty due to parasites and tend to reduce the market value of the entire lamb crop.

**Half use good rams.** Only slightly more than half of the sheep ranchers interviewed used purebred or crossbred rams whereas all of the cattle ranchers reported used purebred bulls. Practically all of the sheep ranchers with over 1,000 head kept purebred or crossbred rams compared to only a third of the sheep ranchers who had less than 500 sheep.

**Five-year old ewes culled.** Ewes are culled at an average age of about 5.7 years according to estimates from the sheep ranchers (table 12). Some ranchers make it a practice to cull all ewes when they become five years old. Others cull the ewes when they become broken-mouthed or fail to breed.

**Wool clip.** The 1944 wool clip averaged 8.2 pounds per head shorn, varying from a low of six pounds to a high of slightly over 11 pounds.

**Small sheepmen use sheds.** Practically all of the sheep ranchers with less than 500 head used sheds for both winter shelter and lambing. These flocks were in most cases handled by the operator himself, and the sheds or barns on the place

Table 12. Sheep Management Practices

Item	Average	Range
Percent of ranchers using purebred rams, 1944 .....	56.7	.....
Normal age of ewes culled, years .....	5.7	5-7
Normal percent death loss .....	5.5	2-10
Percent lamb crop, 1944 .....	69.7	48-89
Weight of fleece, 1944 .....	8.2	6-11
Percent using sheds for winter shelter .....	84.4	.....
Percent using lambing sheds .....	76.2	.....

were adequate for these rather small flocks. About half of the large sheep ranches (1,000 head and over) depend entirely on natural windbreaks for winter shelter. Ewes on these ranches are "lambd out" in the open with tepees used for additional shelter by some of the ranchers.

**Lamb crop low.** The number of lambs raised per 100 ewes during 1944 ranged from 48 to 89 on the ranches surveyed. The 1944 average percentage lamb crop raised was about 70 which was considerably below the long time average. Under good management a lamb crop of 80 to 90 percent is entirely feasible in the range area. Death loss of lambs was abnormally high during 1944, averaging about 12 percent.

Bad weather at lambing time and poor condition of ewes at breeding time were considered the major causes of low lamb crops by the sheep ranchers (table 13). Severe winters resulting in poor condition of ewes at lambing time, and lack of care due to labor shortages were two additional important factors. Parasites were also mentioned as a cause of low lamb crops.

Table 13. Causes of Low Lamb Crops, Normal

Major cause	Percent of ranchers reporting
Bad weather at lambing time .....	45
Poor condition of ewes at breeding time .....	40
Hard winter, ewes thin at lambing .....	21
Lack of care, labor shortages .....	21
Parasites .....	12

**Causes of death loss.** These ranchers estimated that normal death losses would average about 5.5 percent of the breeding herd. Death losses have averaged more than ten percent for some flocks during recent years of parasite troubles. Death losses varied greatly from ranch to ranch. Some ranchers were successful in keeping losses down to two or three percent, while others had losses several times as high. Over two-thirds of the sheep ranchers considered the coyote a major cause of sheep losses (table 14). Parasites were considered of next importance. Accidents, severe winters resulting in starvation, and poisonous plants were also mentioned as causes of death loss in flocks.

**Parasite control important.** All of the sheep ranchers visited were treating their sheep against parasites. The problem of parasite control is closely associated with the system of grazing.

Table 14. Causes of High Death Loss in Sheep Flocks, Normal

Major cause	Percent of ranchers reporting
Coyotes .....	68
Parasites .....	42
Accidents .....	21
Hard winter, starvation .....	16
Poisonous plants .....	16
Other causes .....	11



A study of the grazing practices of 106 sheep operators during 1945 showed a close relationship between size of flock and grazing practices.<sup>3</sup> The ranchers with less than 300 ewes provided only half as many acres per ewe as the operators with 700 or more ewes (table 15). Over half of the smaller operators and less than one-third of the larger operators provided less than five acres grazing land per ewe. A small acreage of grazing land available per ewe makes it difficult for sheepmen to move their flocks to new ground as frequently as is needed to hold down worm infestations.

Table 15. Grazing Practice of 106 Sheep Ranchers, 1945

Item	Size of flock		
	Under 300	300-699	700-over
<b>Average acres per ewe</b>	<b>3.4</b>	<b>5.3</b>	<b>6.5</b>
<b>Ranchers reporting</b>	<b>Percent</b>	<b>Percent</b>	<b>Percent</b>
Less than 5 acres per ewe .....	54	31	29
Changing range weekly .....	13	16	48
Changing range every 2 weeks .....	13	19	31
Changing range monthly .....	21	31	13
Changing less than monthly .....	25	9	4
Range not changed .....	17	6	0
Not stated .....	13	19	4

Forty-eight percent of the sheepmen with 700 or more ewes reported moving their flocks to new ranges weekly compared to only 13 percent of the operators with less than 300 ewes. Forty-five percent of the small flocks and 17 percent of the large flocks were moved to new range as infrequently as once a month or less.

## Crop Yields and Management

### Crop Yields

**1944 yields double.** Yields of small grain and corn were unusually good during 1944. Yields of most crops on the ranches studied were almost double the twenty-year average for the four counties (table 16). Estimates of crop yields that might be expected in the future were well below 1944 but the greater use of better tillage methods, improved crop varieties, and the elimination of poor quality cropland can be expected to result in yields higher than the twenty-year average.

### Cash Grain Farm Management Practices

**Combines used extensively.** About three-fourths of the 1944 small grain acreage was harvested with combines on the cash grain unit (table 17). Since less than half of these operators owned combines, it was necessary for a considerable acreage to be custom combined. About two-thirds of the cash crops are hauled directly to market at time of harvest. In recent years some of this grain has been placed under Commodity Credit loan and sold later.

<sup>3</sup>The Veterinary Department of South Dakota State College summarized mail questionnaires from representative sheepmen in the range area.

Table 16. Crop Yields, 1944, Expected and 1924-43 Average and Percent of Ranchers Producing Various Crops, 1944

Crop	Crop yields			Percent of ranchers producing crops			
	84 ranches 1944	Expected	1924-43 Area av.	Cattle	Sheep	General	Cash grain
Wheat, bu. ....	13.8	11.9	7.6	44	52	100	100
Oats, bu. ....	36.3	26.3	14.9	56	71	94	53
Barley, bu. ....	27.1	21.2	13.4	48	57	57	58
Rye, bu. ....	14.0	13.0	9.8	—	5	11	5
Corn, grain, bu. ....	22.7	17.6	10.3	9	14	72	63
Corn, forage, tons ....	1.2	1.1	—	39	38	17	—
Crested, wheat grass, tons .	.8	.8	—	48	38	78	63
Wild hay, tons ....	.8	.5	.5	83	86	94	74

The majority of the feed crops are fed to the comparatively small number of livestock kept on the cash grain farms. The usual acreage summer fallowed is twelve percent of the cropland. During 1944 about six percent of the cropland acreage was fallowed. Only one farmer in six reported following any rotation at all. Very few of the operators who follow a regular sequence of crops use legumes in the rotation.

Table 17. Management Practices on Cash Grain Farms, 1944

Item	Average percent
Small grain harvested with combines .....	74
Grain hauled directly to elevator .....	63
Feed grain fed on place .....	74
Cropland summer fallowed, usual .....	12
Cropland summer fallowed, 1944 .....	6
Using regular rotation .....	17
Using purebred bulls .....	74
Cattle kept chiefly for beef .....	60

About three-fourths of the cash grain farmers reported using purebred bulls. Of all the cattle kept on these farms, about 40 percent are kept for milk and 60 percent for beef. About a third of these operators vaccinate for blackleg and a fifth for anthrax.

## Ranch Income

### Receipts and Expenses

**Receipts.** Livestock accounted for over 80 percent of the receipts for the cattle and sheep ranches (table 18). On the general ranch almost half of the income came from the sale of crops, while on the cash grain farms over two-thirds of the income was from crop sales. The net receipts as shown in table 18 include sales of livestock, livestock products, crops, and other income with deductions made for live-

stock purchases and adjustments for changes in inventories. Total receipts averaged the highest for the sheep ranches and the lowest for the general ranches.

Table 18. Income and Expense Summary, Average Per Ranch, 1944

Item	Type of Ranch			
	Cattle	Sheep	General	Cash grain
<b>Net Receipts</b>				
Cattle .....	\$3,985	\$ 337	\$1,458	\$ 640
Sheep and wool .....	248	5,697	75	44
Hogs .....	357	29	938	434
Butterfat .....	134	18	50	271
Poultry and eggs .....	116	72	141	154
Crop sales .....	998	932	2,597	3,882
Other income .....	384	298	285	456
Total .....	\$6,222	\$6,983	\$5,544	\$5,881
<b>Expenses</b>				
Taxes, leasing and Graz. fees	377	385	256	148
Hired labor .....	265	802	270	351
Feed .....	252	999	134	94
Gas, oil, machine hire .....	303	452	537	698
Bldg., mach., & fence repair	279	301	232	361
Veterinary .....	27	103	9	7
Other expenses .....	256	391	349	288
Total cash expenses .....	\$1,759	\$3,433	\$1,787	\$1,947
Bldg. & mach. depreciation .....	293	354	312	327
Total expenses .....	\$2,052	\$3,787	\$2,099	\$2,274
Net income .....	\$4,170	\$3,196	\$3,445	\$3,607

**Expenses.** The kinds and amounts of individual expense items varied greatly from ranch to ranch. Taxes, leasing, and grazing fees taken as a whole was the largest single group of expenses for the cattle ranches. This item of expense was also high for the sheep ranches. Hired labor and feed were by far the highest individual expense items for the sheep ranches. These two items made up half of the total expenses. However, the expenditure for feed was abnormally high for the sheep ranchers due to the extremely severe winter of 1944. Gasoline, oil, and machine hire expenses were the highest for the general and cash grain units. Hired labor and repairs were also important expense items for the cash grain farmers.

Total ranch expenses, including building and machinery depreciation, averaged somewhat over \$2,000 for the cattle, general and cash grain units, and \$3,787 for the sheep ranches.

**Net ranch income.** Net ranch income is the amount left after deducting all expenses, including depreciation, from the total net receipts. No deductions have been made for interest on capital invested except on that portion covered by a debt. Nor has any deduction been made for value of the operator's or unpaid family labor.

The net ranch income averaged \$4,170 for the cattle ranchers, or about \$1,000 more than for the sheep ranchers. The two chief factors contributing to the lower income for the sheep ranch operators during 1944 were (1) extremely high feed and labor costs, and (2) parasites. Under more normal seasons, the ranch income could be expected to average as much for the sheep as for the cattle operator. The net ranch incomes for the general and cash grain units were somewhat higher than for the sheep ranches, but considerably lower than for the cattle ranches. Net ranch income averaged \$3,445 for the general ranchers and \$3,607 for the cash grain operators.

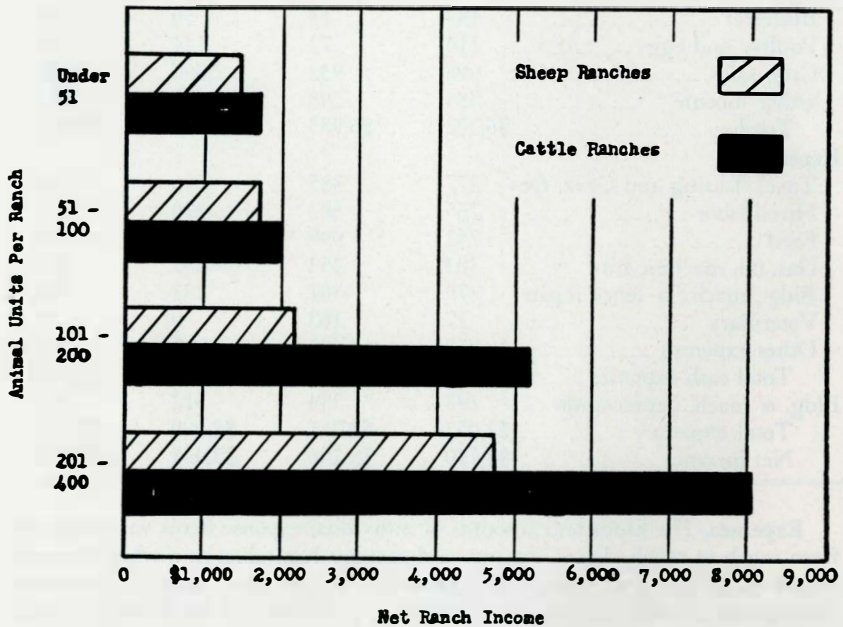


Figure 4. Net ranch income, by size of ranch, cattle and sheep ranches.

### Management Factors Affecting Income

Net ranch income varied widely with the greatest range found for the cattle operators. Net income for all of the ranches studied ranged from a low of under \$500 to a high of over \$20,000. The lowest incomes were found on the small sheep ranches. These variations in income are partly due to difference in size of ranches and in resources available to the operator. However, some of the major reasons for variations in net income are due to organization and management factors which are more or less within the control of each rancher.

**Size of Ranch.** Size of ranch business was found to be one of the most important factors affecting income. An adequate income for cattle and sheep ranchers requires enough livestock to utilize labor and other resources to best advantage.



Net income figures for the four size groups of cattle and sheep ranches shows the importance of a reasonably large unit. Net incomes for the cattle ranches with 101 to 200 roughage consuming animal units was about three times as high as for the units with 50 or less roughage consuming animal units (figure 4). Although net incomes for the sheep ranches were considerably less than for the cattle ranches with the same number of animal units, size was an equally important factor.

**Use of labor.** Efficiency in use of labor has been an extremely important factor in recent years. Ranchers who have used their family and hired labor to best advantage have either held expenses down or increased production per worker. An adequate size ranch is necessary for the best utilization of labor. However, the planning of the ranching operations and the use of labor saving machinery and equipment also contribute to efficient labor utilization. The cattle and sheep ranchers who averaged less than 50 animal units per worker had net incomes of about \$2,000 compared to incomes of over \$7,500 for the ranchers who averaged 115 or more animal units per worker.

**Calf and lamb crops.** Low incomes on many ranches are due to a small calf or lamb crop. However, extremely high calf and lamb crops may not be the most profitable. Many ranchers have expressed the belief that the extra cost involved in saving a high percent of the calf or lamb crop is not ordinarily justified. Generally, the extremely high calf and lamb crops were associated with the smaller ranches. Year-around breeding, more individual care and better facilities for shelter were factors contributing to higher calf and lamb crops on these small units.

The ranch study showed that incomes of cattlemen with calf crops of 80 per cent and over were \$1,100 higher than those with calf crops below 80 percent. Similarly, income on the sheep ranches showed the importance of raising a high percent of lambs. Sheep ranchers who raised 75 or more lambs per 100 ewes had \$1,900 higher net incomes than those raising less than 75 lambs per 100 ewes.

**Wool clip.** The sheepmen who produced nine or more pounds of wool per head had earnings over twice as high as sheepmen who averaged less than seven and one-half pounds per head. Purebred rams were used by all the sheepmen reporting the highest wool clip but by only 25 percent of the sheepmen who got the lowest wool clip.

**High animal unit returns.** High gross returns per animal unit was found to be an important contributor to high net income. Cattlemen who had gross returns of \$38 or more per animal unit had net incomes two and one-half times as great as those with returns of less than \$28 per animal unit. High gross returns per animal unit of cattle are dependent on a high calf crop, heavy calves at weaning time, high quality cattle and a good selling price.

A similar study of the gross returns per ewe on the sheep ranches showed almost \$1,000 more net income on the high third of the group compared to the lower third of the group on the basis of gross returns per ewe. The high return groups averaged \$9.39 gross return per ewe compared to \$5.04 gross return per ewe for the low group. A high wool clip and lamb crop, plus heavy lambs and a good selling price contribute to high gross returns per ewe.

**Efficient ranching pays.** Efficient management in all of the factors studied contributed to high incomes for both the cattle and sheep operators. The cattle ranchers who excelled in all four management factors had net incomes about seven

times as great as those who were above average in none or only one factor (figure 5). The four management factors were (1) size of business (number of roughage consuming animal units), (2) animal units per worker, (3) percent calf crop, and (4) gross returns per animal units.

The sheep operators who excelled in four or five of the factors studied had net incomes that averaged over \$8,000 (figure 6). Sheep ranchers who were above

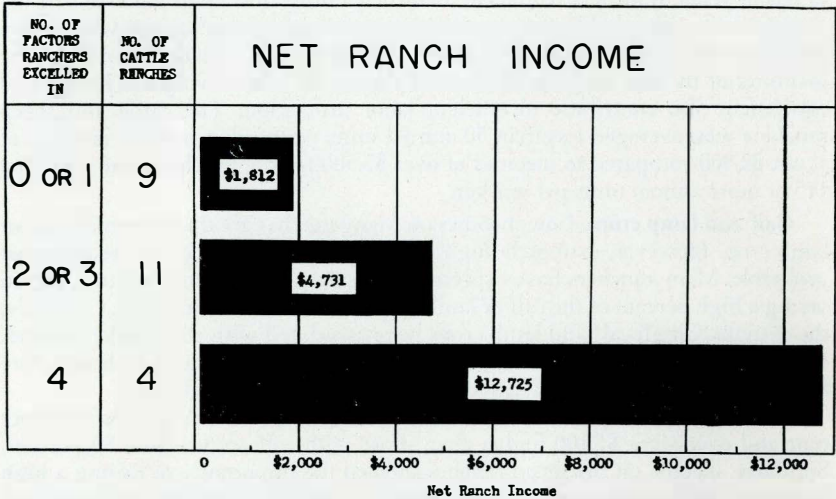


Figure 5. Relationship of number of management factors in which cattle ranchers excelled to net income.

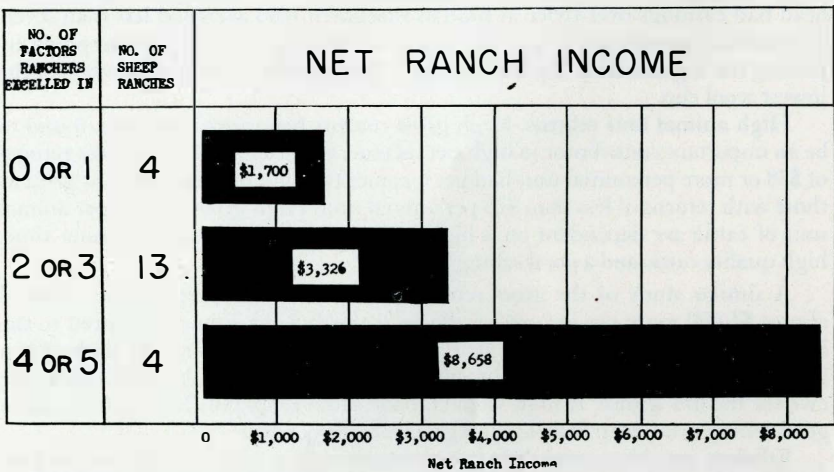


Figure 6. Relationship of number of management factors in which sheep ranchers excelled to net income.

average in none or only one management factor had incomes of less than \$2,000. This emphasizes the importance of a rancher studying his entire ranching operation. Efficiency in some phases may be offset by poor management in other parts of the ranch. The five sheep management factors studied were (1) size of business (number of roughage consuming animal units), (2) animal units per worker, (3) percent lamb crop, (4) pounds wool per head, and (5) gross returns per ewe.

**Price important factor.** Although price is an extremely important factor in determining year-to-year changes in income, it is not ordinarily classed as a management factor. The average rancher has little influence on the level of prices for the cattle, sheep, wool and other products he sells. However, he can increase the price he receives by improving the quality of product sold and by studying the seasonal price changes and thus increase his income. A study of prices and price levels by individual ranchers will help them make important decisions regarding year-to-year adjustments in their size of operations, in outlays for repairs and new investments, and in the liquidation of their indebtedness.

## Apparent Adjustments Needed

### Size of Units

**Many ranches too small.** Available records indicate that about one out of every five operating units in the range area is so small that neither labor nor other resources can be used effectively. On many of these small ranches the operators or members of the families must find work off the ranch to supplement their meager income. Even with favorable weather and high prices the past few years, the ranchers with less than 50 head of cattle or 250 head of sheep had very low incomes.

**Increase in ranch size.** The ranchers visited were asked about their long time plans regarding changes in acres operated. Their plans varied with the age of the ranchers, the size of unit they now operate, and available labor. Only small increases in the average size of cattle and sheep ranches can be expected in the future based on information from these livestock producers. However, the average general rancher expects to add about 350 acres and the cash grain farmer about 280 acres to their present units. About half of the ranchers visited do not plan any change in size of unit while some ranchers expect to add as much as 1,000 or more acres. These increases are indicated chiefly for the group of under-sized units. Some of these increases will come about through the consolidation of existing units upon retirement of present operators.

### More Stable Ranching

**Reduce dependence on grain.** A large majority of the ranchers in the area have agreed that the production of range cattle and sheep are the least hazardous of any of the present types of agricultural production in the range area. In many cases the principle obstacle to an increase in cattle and sheep numbers on small ranches is the inability of operators to acquire additional land that will permit expansion of their livestock enterprises. Under such conditions the operator has no choice but to use all means at his command to increase incomes from present holding, or to



move to some locality where more adequate ranches are available. As stated in a previous section of this publication, many of the smaller cattle and sheep operators are planning to increase livestock numbers.

**Shift to cattle or sheep ranching.** The greatest change in livestock and grain production was proposed by the general ranchers. These ranchers plan on doubling the number of roughage consuming livestock and reducing the grain acreage by one-fifth. This would change the classification of many of the general units to

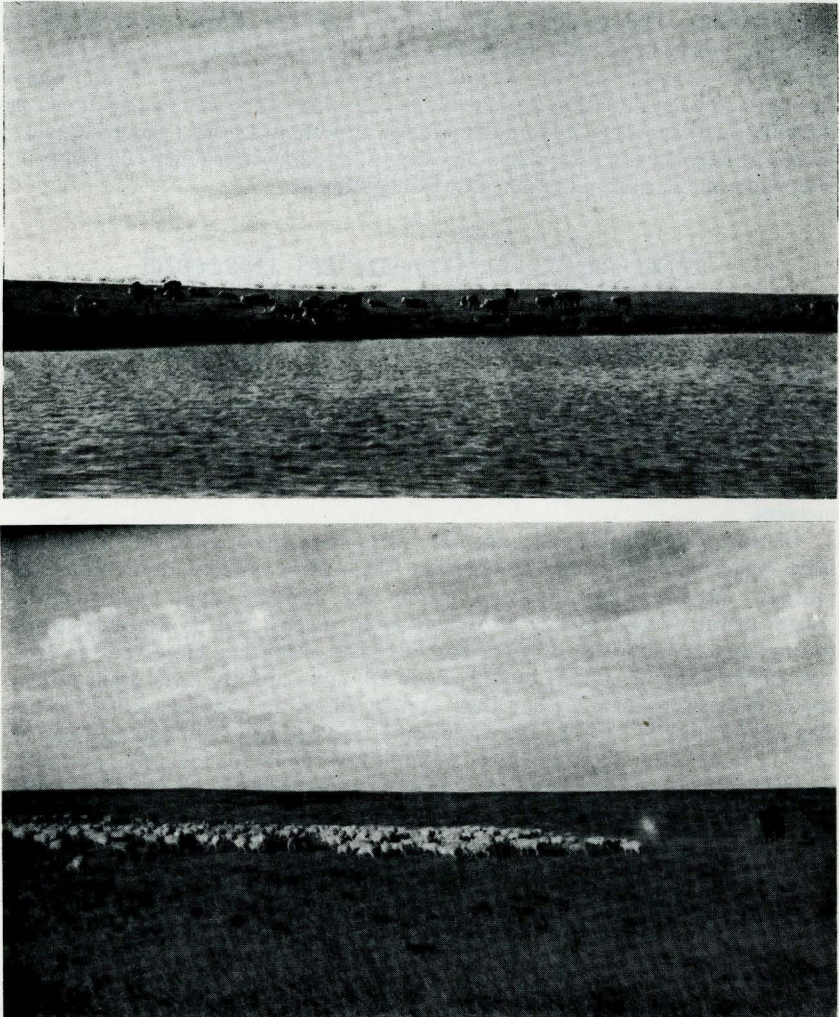


Figure 7. Stock watering dams have increased the carrying capacity of the range by utilization of grassland which would otherwise go unused.



cattle or sheep ranches. The cash grain operators plan on increasing their acreage in tame and wild hay and grazing land. This will make it possible for them to increase their roughage consuming livestock from an average of 30 to an average of 50 animal units.

### **Adaptations to Environment**

The range area has been characterized by extremes in crop and livestock production during the past 25 years. These fluctuations have been partly due to vio-

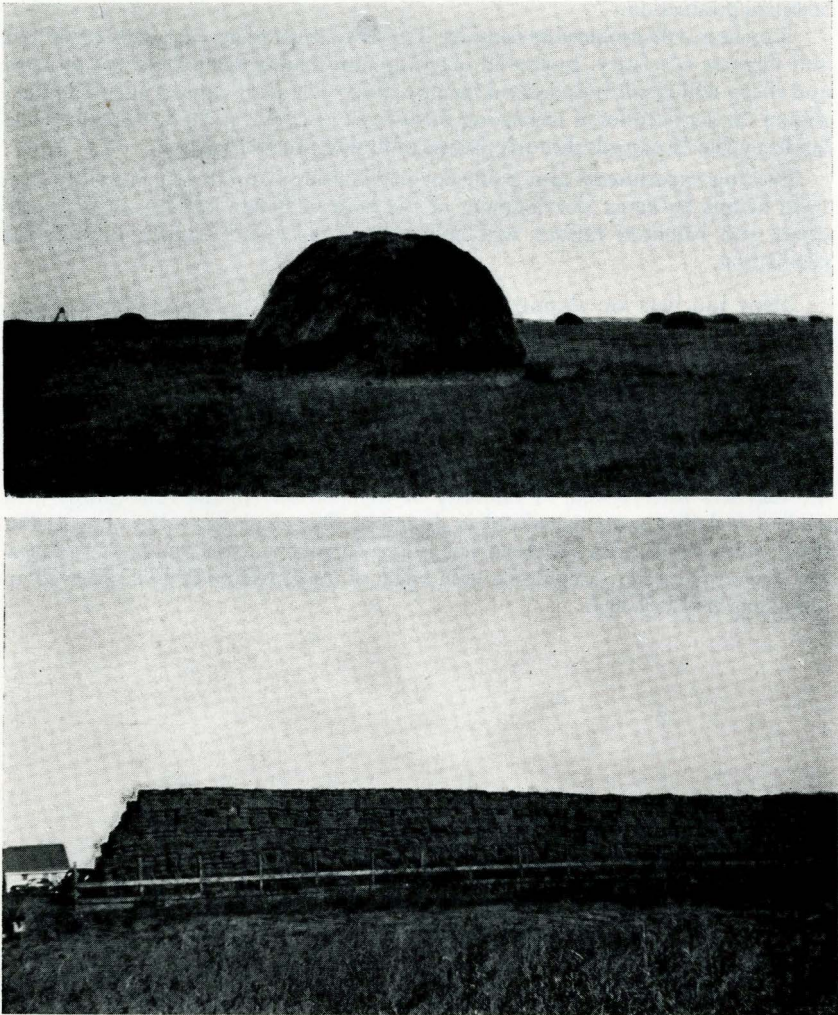


Figure 8. Most ranchers attempt to carry over at least a one-year, and if possible, a two-year supply of roughage.

lent climatic changes. However, the effects of these climatic changes on production and income would have been less extreme if the crops and livestock produced had been better adapted to the environment.

Most of the crops grown in this area have been developed for areas with more favorable climatic and environmental conditions. A shorter growing season, less rainfall, grasshoppers and other factors make it desirable for crops to be tailor-made for the area. More desirable varieties undoubtedly will be developed for the range area. Improved cropping practices will also help to reduce risk and help stabilize production.

Ranchers will also need to consider livestock adjustments that will reduce risk and increase efficiency. Improved breeding and management practices of cattle and sheep will result in increased income. Experiments in animal breeding have shown the possibilities of increasing the weight of calves by 20 to 70 pounds and lambs by 5 to 10 pounds through the use of higher producing sires.

Feeding experiments also point out possibilities of producing heavier calves from heifers by better development of the heifers. Better feeding through adequate and balanced rations will help reduce risks and failures in livestock production.

Many ranchers are alarmed at the large acreage of grassland that has been plowed up since 1944. This process has been especially prevalent in Perkins and Corson counties, and to a lesser extent in counties to the south. A high proportion of this grassland breaking has been done by out-of-state speculators. Extremely favorable climatic conditions and high grain prices have made this practice profitable.

This increase in the acreage of cropland conflicts with the plans of most of the ranchers interviewed. A majority of the ranchers in the four-county area studied feel that more grassland is desirable. Past experience has shown that small grain production has been hazardous in much of the range area. Many years were required to seed down even a part of the grassland that was plowed up following World War I.

## Summary and Conclusions

The ranch study made during 1945 in the four northwestern counties of the state revealed the following important facts:

1. Four major types of ranches were found in the area, namely cattle, sheep, general and cash grain. The sheep ranches averaged the largest in both total acres operated and numbers of roughage consuming livestock. The average size of ranch for the area was as follows: cattle, 3,157; sheep, 4,178; general, 1,403; and cash grain, 1,150 acres. These ranches ranged in size from a few as small as 320 acres to a few well over 20,000 acres.

2. The four types of ranches studied contributed the following percentages to total numbers in the area: cattle, 33.5; sheep, 19.5; general, 18.5; and cash grain, 21.6.

3. Considerable variation was found in the degree of mechanization on the 84 ranches visited. Tractors were owned by most general and cash grain operators but by only a small proportion of the cattle and sheep ranchers. The general and cash grain operators used combines and trucks extensively. Power mowers and buck rakes were important machines used by many ranchers.

4. Many desirable grazing and conservation practices have been developed in recent years. These include the separation of the range into a number of pastures used for seasonal grazing, the seeding of poor quality cropland or grassland to crested wheat grass for early hay and pasture, the building of stock water reservoirs, strip cropping, irrigation of hayland, firebreak construction, and shelter belt planting.

5. Most of the cattle are marketed through livestock auctions or shipped to terminal public markets. The sheepmen on the other hand sell practically all of their lambs direct to feeders and dealers.

6. Ranching, in general, was fairly profitable during 1944. Net ranch income averaged \$4,170 for the cattle ranchers, \$3,196 for the sheep ranchers, \$3,445 for the general ranchers and \$3,607 for the cash grain operators. High feed and labor costs, and parasite problems resulted in lower incomes for sheep ranchers than for cattle ranchers.

7. High net income on all four types of ranches was closely related to good management. The cattlemen who ranked above average in all four management factors studied had incomes about seven times as great as the cattle ranchers who were above average in none or only one factor. About the same relationship of efficiency in management to net income was found on the other three types of ranches.

8. The major adjustments suggested for the range are:

(1) Increasing the size (both acres and livestock numbers) of a large proportion of ranches.

(2) Adjusting ranching operation to fit environment.

(3) Seeding of a considerable acreage of cropland to crested wheat grass and other permanent grasses.

(4) Greater emphasis on beef cattle and sheep production and less dependence on other livestock and grain as a stabilizing factor.

(5) Wider adoption of better livestock and range management practices.