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Contents

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by

Dee A. Broadbent, George T. Blanch and W. Preston Thomas[2]

INTRODUCTION

RANGE sheep production has been one of the major agricultural enterprises in Utah, particularly in the southwestern part of the state, since these areas were first settled. Stock sheep numbers in Utah were about 2,100,000 by 1890, which is approximately the present number in the state. Since 1890 the numbers have fluctuated between 2,000,000 and 2,775,000.

This important industry has, from the time of its introduction, been closely associated with the use of public range lands. The unrestricted grazing of public range lands resulted in damage to a considerable area and was one of the important factors that led to the establishment of federal agencies to administer these properties.

The establishment of the National Forest Service in 1905 and the Grazing Service in 1934 brought into existence the two most important federal agencies which supervise and administer the use of public lands. At present over two-thirds of the total land area of Utah consists of grazing lands administered by these agencies. The location and type of grazing lands included in such areas often necessitate that these lands be used in conjunction with private lands to obtain the best use of both. The success of the range livestock industry is closely associated with administrative policies as well as proper use of the range resources. Changing economic conditions and new regulations effecting use of public lands have in the past and will likely continue to force users of grazing lands to make adjustments in their organization and adopt different operation practices to meet the new conditions.

This study is one of a series being conducted by the Department of Agricultural Economics designed to furnish a general description and detailed analysis of the type of farming in various parts of Utah.[3] In this phase of the study a description and analysis of the range sheep enterprise of southwestern Utah were made. The specific objectives

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[1] Report on project 149, subproject 8—Purnell.

[2] Assistant professor, associate professor, and professor of Agricultural Economics, respectively.

[3] The first part of this study, a general description of the types of farming in Utah, was published in Utah Agr. Exp. Sta. Bul. 275, 1936.

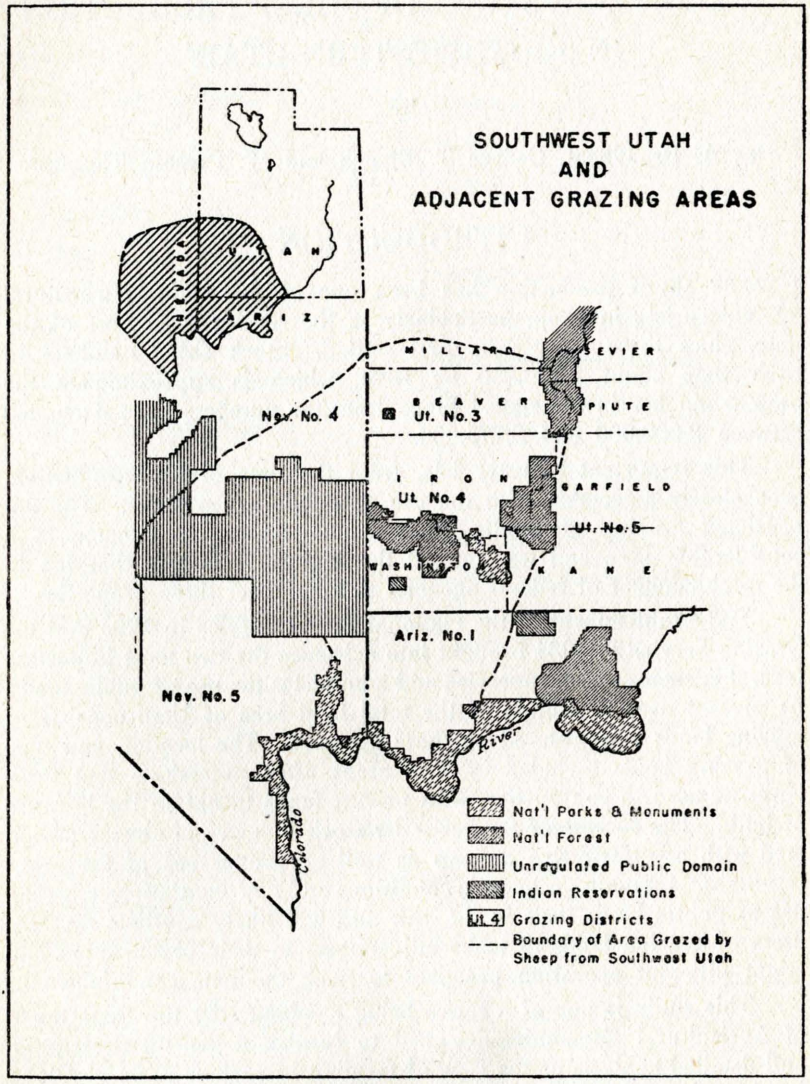

Figure 1

were: (1) to identify and analyze the various types of organization of sheep ranches; (2) to determine the relationship of differences in production practices to the economic success of the enterprise; and (3) to analyze the factors affecting costs and returns from the range sheep enterprise.

LOCATION AND DESCRIPTION OF THE AREA

LOCATION

Southwestern Utah, as defined for purposes of this study, is composed of Beaver, Iron, and Washington Counties (fig. 1). Livestock owned by operators living within this area, however, graze over areas outside these counties; particularly in the "Arizona Strip," in southeastern Nevada, and, to a lesser extent, in the western portions of Kane and Garfield Counties in Utah.

The home ranches or headquarters of most of the stockmen in this area are in or near the principal towns where most of the cropland is located. The winter grazing lands are in the western portions of the counties and in Nevada and Arizona; the summer grazing lands are in the higher elevations in or adjacent to the Dixie and Fishlake national forests.

TOPOGRAPHY

There is considerable variation in topographical features of southwestern Utah. The mountains near Beaver and Cedar City are 10,000 to 11,000 feet in elevation. The elevation of the central part of Iron and Beaver Counties is about 5,000 feet, and it is in this area that many of the range livestock are grazed during the winter season. The principal communities of Beaver and Iron Counties are located at the base of the mountain ranges where water for irrigation purposes is available for a limited area.

Washington County is more broken than the two northern counties. The elevation varies from 10,000 feet in the Pine Valley Mountains in the north part to 2800 feet in the Virgin River that flows through the south central part of the county. Less than 20 miles separates these two elevations.

All Washington County south of the summit of the Pine Valley Mountains is part of the Colorado River drainage system. The Virgin River and its tributaries drain the area and provide water for irrigation purposes. Beaver and Iron Counties are included in the Great Basin drainage system. The area is drained by small rivers and creeks which head in the higher elevations and flow toward the desert areas where the water is either stored or used for irrigation purposes or is dissipated in the arid desert area.

CLIMATE

The average annual precipitation in this area varies from less than 8 inches in the desert areas to over 20 inches on the higher elevations. Most of the area receives less than 12 inches annual precipitation which limits the agricultural use of most of the land to

livestock grazing, except where irrigation water is available. This small amount of moisture is distributed somewhat evenly throughout the year. In practically all of the areas crop production is dependent upon irrigation water. A small acreage of dry land wheat is produced in Iron and Washington Counties.

The length of the growing season is greatest in St. George where normally crops grow an average of 198 days without danger of frost. This is contrasted with the growing season of Beaver Valley of only 107 days, where the elevation exceeds that of St. George by over 3,000 feet. The growing season largely determines the type of crops grown within the area. In Washington County the major crops are hay and grain, however, a considerable portion of the acreage of the cropland is devoted to the production of fruits and vegetables, while in the two counties to the north with a higher elevation, principal crops are grain, hay, and a few hardier vegetables.

A combination of the elevation, precipitation and length of growing season determines the forage type and consequently the season of use of the ranges. Because of the geographical location of southwestern Utah the climatic conditions are subject to considerable variability. This results in year to year variation in the quantity as well as the time the range forage is ready for grazing.

WATER SUPPLY

The principal source of water for irrigation purposes in Beaver County comes from the Beaver River and the Minersville Reservoir which stores water from the Beaver River. However, in the Milford area most of the crops harvested are irrigated from underground water sources. Water for irrigation purposes in Iron County is available from both underground and gravity sources. Gravity water comes from a number of small streams, all of which are characterized by a relatively short drainage basin which makes storage difficult and costly. A large portion of the water comes during the spring runoff and declines rapidly as the summer progresses. Underground water is available in two different basins in Iron County, one in the Escalante Desert area and the other in the vicinity of Cedar and Parowan. In Washington County, the Virgin River and its tributaries are the principal sources of irrigation water.

In none of the areas is the amount of water adequate for irrigating all of the available land that is suitable for crop production, and unfortunately the time of runoff of a large portion of the water does not coincide with the time when the water is needed for irrigation of farm crops. Normally this area does not produce sufficient feed to meet the requirements of the local livestock. If range livestock are main-

tained in numbers large enough to harvest the forage crop on the great acreage of range land in this area, water resources will have to be directed to the production of feed crops which can be used to supplement range resources and facilitate proper seasonal use of ranges.

TYPES OF FARMING

According to the 1940 census of agriculture more than 29 percent of all the farms in this area were part-time farms and only 21.9 percent obtained the major part of their income from the sale of range livestock and wool (table 1). Although this entire area is normally thought of as a range livestock area far more than half the farmers do not use the range or have range permits.

Table 1. *Number of farms of selected types in southwestern Utah*, 1939*

Type of farm	Beaver	Iron	Washington	All	Percent of total
	number	*number*	*number*	*number*	*percent*
Range livestock	71	164	107	342	21.9
Dairy	136	37	27	200	12.8
Field crops	63	108	118	289	18.5
Fruits and vegetables	—	12	79	91	5.9
Part-time	46	146	264	456	29.2
All other	13	83	86	182	11.7
Total	329	550	681	1560	100.0

*Based on U. S. Census of Agriculture classification according to major source of income.

One of the most important agricultural problems is the great number of small farms being operated on a part-time basis where there is little opportunity of supplementing income from non-farm sources.

TRANSPORTATION AND MARKETS

This area is handicapped somewhat from the lack of transportation facilities. Cedar City and Milford are the only larger communities that have railroad facilities. Milford is located on the main line and Cedar City is served by a branch line of the Union Pacific railroad. The balance of the area is dependent for transportation upon highways, the principal one of which is U. S. 91 which runs through the four largest communities in the area; namely: St. George, Cedar City, Parowan, and Beaver. This hard-surfaced road connects the area with Los Angeles on the southwest and Salt Lake City on the north, and makes possible truck transportation to outside markets throughout the year.

Cedar City is the most important lamb and wool shipping center in the area. Los Angeles and the Pacific Coast area have recently become the most important market outlets for livestock and some of the

harvested crops. However, a major portion of the wool is still shipped by rail to eastern markets. The lambs produced in this section are chiefly sold as feeders, some of which are bought and fed within the state but most of them are shipped into California and midwestern feeding areas for fattening. A smaller portion of the lambs shipped out of the area are sold as fat lambs.

LAND AREA AND OWNERSHIP

The total land area in the three counties is approximately 5,320,000 acres, of which 3,910,000 or 73 percent is controlled by federal agencies and about 1,060,000 or less than 20 percent is private land (table 2). The state-owned lands in this area were about equally

Table 2. *Control of land in southwestern Utah*, 1940

Class of land	Beaver		Iron		Washington		Total	
	1000 acres	per-cent	1000 acres	per-cent	1000 acres	per-cent	1000 acres	per-cent
Private land*	152	9.2	685	32.4	223	14.4	1,060	19.9
County lands*	27	1.6	78	3.7	11	.7	116	2.2
State lands*	119	7.2	113	5.3	102	6.6	334	6.3
Forest Service†	141	8.5	238	11.3	389	25.0	768	14.4
National parks* and monuments	—	—	10	.5	127	8.2	137	2.6
Indian reservations*	0.9	0.6	—	—	27	1.7	36	0.7
Grazing Service‡	1,208	72.9	988	46.8	673	43.4	2,869	53.9
Total land area§	1,656	100.0	2,112	100.0	1,552	100.0	5,320	100.0

* Source—County records
† Forest records for 1943
‡ Residual
§ Source—U. S. Census of Agriculture 1940

distributed in each of these counties with a total of 334,000 acres or 6.3 percent of the total land area. A great portion of the state lands is held by the state for the support of the school systems. Unfortunately, however, they are widely scattered over the entire area, which makes them difficult to administer.

GRAZING RESOURCES

Over 5,000,000 acres of the land in this area is used for grazing by domestic livestock and wild game. On the Grazing Service lands in 1940 there were permitted 381,124 animal unit months of grazing (table 3). The same year the Forest Service issued permits for the grazing of 88,178 animal unit months. It has been estimated that the animal unit months provided on other range lands in southwestern Utah would equal about 200,000. The range resources in Iron and Washington Counties are utilized entirely by livestock operators living in southwestern Utah; and in addition operators in these two counties

obtain approximately 200,000 animal unit months of grazing from public ranges in Arizona and Nevada. Most of the grazing lands on the "Arizona Strip" are utilized by southwestern Utah stockmen and much of the public grazing land in southeastern Nevada is also utilized by stockmen residing in Washington and Iron Counties. The grazing lands in Arizona and Nevada are used primarily during the winter grazing season. Most of the grazing available in Beaver County is of the winter and spring-fall type and is utilized to a large extent by operators living outside the area principally from Millard, Sanpete and Sevier Counties.

Table 3. *Animal unit months of grazing obtained from ranges in southwestern Utah, 1940, by counties*

County	Grazing Service*	Forest Service*	Other† range land	Total	Proportion used by sheep†
	animal unit months	*animal unit months*	*animal unit months*	*animal unit months*	*percent*
Beaver	206,775	11,530	43,866	262,171	69
Iron	111,560	29,663	120,649	261,872	79
Washington	62,789	46,985	42,618	152,392	38
Total	381,124	88,178	207,133	676,435	66

* Animal unit months of grazing permitted on Forest Service and Grazing Service lands; non-use permits excluded.

† Estimates made by Clyde E. Stewart and Donald T. Griffith in "Study of land utilization and farm management in southwestern Utah," U. S. Bur. Agr. Econ., and Utah Agr. Exp. Sta. February 1942. ms.

USE OF CROPLAND

In 1939 less than 50,000 acres of crops were harvested in this area. Of the total, 25,960 acres or 56.6 percent consisted of hay and 14,671 or 32 percent were used for the production of grain crops (table 4).

Table 4. *Acreage of harvested crops in southwestern Utah, 1939**

Item	Beaver	Iron	Washington	Total	Percent of total acres
	acres	*acres*	*acres*	*acres*	*percent*
Grain crops					
Wheat	641	1,604	3,476	5,721	13.5
Barley	564	1,865	1,551	3,980	8.7
Oats	426	612	269	1,307	2.8
Corn	800	1,812	670	3,282	7.2
Mixed grains	—	81	300	381	.8
Hay crops					
Alfalfa	7,179	10,450	5,578	23,207	50.6
Other hay	1,549	536	668	2,753	6.0
Potatoes	69	646	341	1,056	2.3
Vegetables for sale	2	758	149	909	2.0
Tree fruit	8	18	1,313	1,339	2.9
Miscellaneous crops	718	379	858	1,955	4.2
Total cropland harvested	11,956	18,761	15,173	45,890	100.0

* Based on U. S. Census, 1940

The balance of the acreage, 11.4 percent, was used for potatoes, fruits and vegetables, and other miscellaneous crops. Most of the acreage used for fruit production was in Washington County where climatic conditions are favorable.

CLIMATE AND PRICE SITUATION FOR THE YEARS 1939, 1940, AND 1941

PRECIPITATION AND GROWING SEASON

Precipitation for the first two years of the study was below normal at all the principal weather stations in the area except St. George (table 5). But in 1941 it was almost 50 percent above normal

Table 5. *Climate during* 1939, 1940 *and* 1941*

Item	Year	Unit	Beaver	Milford	Cedar	Modena	St. George
Elevation		feet	5,885	4,962	5,805	5,460	2,880
Precipitation	Normal	inches	13.93	8.60	13.18	10.14	8.86
	1939	inches	8.86	5.26	10.30	8.83	9.60
	1940	inches	12.54	5.50	9.42	8.63	10.86
	1941	inches	20.48	13.22	18.76	16.28	14.38
	1939-41	inches	13.96	7.99	12.83	11.25	11.61
Length growing season	Normal	days	107	128	149	138	198
	1939	days	125	156	137	127	226
	1940	days	157	152	158	159	233
	1941	days	142	138	138	140	196
	1939-41	days	141	149	144	142	218

* Data from annual summaries of U. S. Weather Bureau and 1941 Yearbook of Agriculture, "Climate and man."

throughout the area. For the three year period the average precipitation was about normal at all stations but St. George and there annual rainfall exceeded the normal all three years. Because of very limited water storage facilities, the annual precipitation and the distribution of the moisture throughout the year is closely associated with crop production as well as range forage production.

At Beaver, Milford, and St. George the length of growing season was normal or above normal in all three years; but in the Cedar area it was below normal in all years but 1940. At Modena, one of the stations located in the winter grazing area, the growing season varied from 127 to 159 days but was about normal for the three years. The figures for the length of growing season apply to cultivated crops; browse and other range forage plants no doubt grow for a longer period of the year.

The general growing conditions during the period of the study as influenced by moisture and favorable growing temperatures, although varying considerably, were relatively as favorable as normal.

PRICE SITUATION

The prices received by Utah farmers for major agricultural products produced in southwestern Utah, for the years 1939 to 1941 were not as high as the average for the period 1910 to 1941 and except for beef cattle were not as high as during the decade of the twenties (table 6). However, there had been considerable improvement in prices received for farm products since the low of 1933. Livestock and livestock prices were relatively much more favorable than prices paid for crops. During the three years of this study the trend in farm prices was definitely upward; the farm price of wool increased 11 cents per pound and lamb prices increased almost $2.00 per hundredweight, while prices paid farmers for hay declined and grain prices were still relatively low although they had increased 28 percent during the three years 1939 to 1941.

Table 6. *Prices paid farmers in Utah for major agricultural commodities produced in southwestern Utah**

Farm prices	Lambs	Wool	Beef cattle	Butter-fat	All hay	Barley
	dollars 100 *lb.*	*cents per pound*	*dollars* 100 *lb.*	*cents per pound*	*dollars per ton*	*dollars per bushel*
1910-14	6.16	15.1	5.29	28.95	8.97	.59
1915-20	11.02	38.4	7.77	40.4	15.64	1.29
1921-30	10.55	33.8	6.37	41.4	9.66	.74
1931-38	6.12	18.4	4.84	26.7	8.26	.53
1939-41	7.99	26.2	7.14	32.3	8.23	.49
1939	7.23	20.7	6.48	27.3	8.27	.42
1940	7.67	26.1	6.78	30.6	8.26	.50
1941	9.08	31.8	8.16	38.9	8.16	.54
1910-41	8.60	27.2	6.15	34.7	10.19	.74

* Data from Thomas, W. Preston. Prices of farm products in Utah. Utah Agr. Exp. Sta. Bul. 217, 1930, and Utah price situation, monthly mimeographed supplement, Utah Agr. Exp. Sta.

Prices of hay and grain in southwestern Utah are normally higher than the average for the entire state. The price of hay in this area for the years 1939-41 was approximately $2.00 per ton higher than the state average; and barley prices exceeded the state average by 5 to 10 cents per bushel.

The average index of all Utah farm prices during 1939 to 1941 was 105, or they were 5 percent higher than the 1935-1939 average, but in 1939 farm prices were 3 percent below 1935-1939 prices and in 1941 the index had risen to 117 (table 7).

Table 7. *Index numbers of prices paid farmers in Utah for major agricultural commodities produced in southwestern Utah*

Year	Utah farm prices all commodities	Lambs	Wool	Beef cattle	Butter fat	All hay	Barley
Average 1935-39	100	100	100	100	100	100	100
1910-14	93	85	69	89	82	110	104
1915-20	158	152	174	131	114	192	228
1921-30	128	146	154	107	117	119	130
1931-38	89	84	84	81	75	101	94
1939-41	105	111	119	121	92	101	87
1939	97	100	94	109	77	101	74
1940	103	106	119	114	87	101	88
1941	117	125	145	138	109	100	96
1910-41	116	119	123	104	98	126	130

METHOD OF STUDY

At the time winter herds were assembled or "made up" in the fall of 1938, detailed ranch records were started by 65 sheep producers. Beginning inventories were entered in the books at that time and visits were made during the succeeding summer to assist in the keeping of the records. At the close of each year's operations, the records were checked in detail with the producer for completeness and accuracy. These records were also supplemented with data from other sources. Almost one third of the ranches were financed by the Wasatch Livestock Loan Association of Salt Lake City, and for these ranches the data on sheep counts, death losses, weights, itemized expenses and sales which were available in the producers' files kept by this finance agency were obtained. Permits to graze on the lands administered by the Grazing Service and Forest Service were checked with these agencies.

The location of the ranches included in the study was limited to Beaver, Iron, and Washington Counties. While ranches were selected at random, an effort was made to obtain a cross section of sheep ranch organization and operation in the area. Only ranches with flocks of 100 or more breeding ewes that were not confined throughout the year to the farm or ranch were selected.

Records from 71 different ranches were used in this analysis, however, only 47 were included all three years, 22 were included two years, and two were included but one year. Records from 56 ranches were used for the year 1939, 64 in 1940, and 59 in 1941.

This report includes: (1) an analysis of the entire ranch business; and (2) an analysis of the sheep enterprise. Sheep and lamb fattening

has been considered as an enterprise separate from the production of lambs and wool for market and is excluded from the analysis of the sheep enterprise.

DEFINITION OF TERMS

Animal unit is a common unit of measure of all kinds of livestock. One mature range cow is considered as the standard, or as one animal unit, and all other livestock equated to this. For example, five sheep on range are equal to one animal unit.

Animal unit month: This is a common measure of time of grazing of all kinds of livestock. It represents the grazing of one animal unit for one month.

A ranch is the total land and livestock operated as one unit, or by one man, partnership or family. Rented land or livestock is included in the ranch of the man who operates it but not in the ranch of the man who is the legal owner. The ranch does not include acreage of public lands used by the operator. However, the value of privilege of using the public land is included in the investment.

Sheep enterprise: The sheep enterprise as used in this study excluded the fattening of sheep for market. It is primarily that portion of the ranch business dealing with the production of wool and lambs under range conditions.

Crop yield index is the yield of all crops in percentage of some base. In this study the base was the average yield for Utah for the period 1926-31. In the calculation of the crop index, each crop was weighted according to the acreage of land from which it was harvested.

Percent lamb crop is the number of lambs on hand at market time divided by the number of mature breeding ewes in the flock at breeding time adjusted for purchases and sales of ewes.

Capital investment: Unless otherwise stated is the average of the value of opening and closing inventories of all property used in the ranching operations, including the operator's home.

Value of unpaid labor is value of unpaid family labor, as estimated by the operator on basis of current wages of ranch labor and amount of work actually done by members of family.

Expenses: Unless otherwise specified, include (a) all current cash expenses for ranch purposes; (b) value of all unpaid labor except that of the operators; (c) the amount, if any, that the beginning inventory values of livestock, ranch feeds, and supplies, real estate, and machinery exceeds the closing inventory values.

Ranch receipts unless otherwise stated, include (a) the ranch value of livestock products sold and the amount received from the sale of livestock minus the amount paid for livestock purchased; (b) the amount received from the sale of crops plus the value of crops on hand at the end of the year that are to be sold; (c) the amount received from miscellaneous sources such as work away from the ranch and the pasturing of livestock; (d) the amount, if any, that the closing inventory values of livestock and feeds and supplies exceeds the be-beginning inventory values. They do not include the value of ranch privileges.

Ranch income or returns for capital and operator's labor and management is the difference between receipts and expenses. It is the financial remuneration to the operator for his year's labor and management and for the use of capital invested in the ranch.

Labor and management income is the return to the ranch operator, in addition to a house in which to live and ranch produce for use in his household, for his year's labor and management. It is the ranch income less interest on capital invested in the ranch business. Unless stated otherwise, it refers to the ranch labor and management income or what the operator's labor and management income would have been had he owned the entire ranch.

Labor earnings are the sum of the labor and management income and ranch privileges. Unless stated otherwise, they are the labor earnings for the entire ranch or what the operator's earnings would be if he owned the entire ranch.

Enterprise receipts include the value of lambs, wool and pelts sold or held for sale and the value of lambs consumed in the camps and by the ranch family. They exclude value of sales from the breeding flock; which sales are considered as an offset against the decrease in value of the breeding flock resulting from death loss and increasing age.[4] (b) The value of lambs held for flock replacement. (c) Receipts, also, include the income received for caring for sheep belonging to other operators; and (d) payments for complying with such AAA programs as were directly related to the stock sheep enterprise.

Enterprise expenses include (a) current cash expenses incurred in the operating of the stock sheep enterprise; (b) depreciation of equipment and improvements; (c) interest at 5 percent per annum on the average capital invested in the enterprise; and (d) herd depreciation of breeding flock as a result of death loss and increasing age of the stock sheep; (e) value of the operator's labor and all other unpaid labor applied to the enterprise. These values are based on average ranch wage rates and do not include any special consideration for the managerial abilities of the operator.

Enterprise profit is the enterprise receipts less the expenses. The profit is the return to the operator for his managerial abilities and for undertaking the business.

TOTAL RANCH BUSINESS ANALYSIS

LAND RESOURCES

The average total area of patented land operated by sheep ranchers included in this study was about 3,551 acres, of which approximately one-third consisted of leased lands (table 8). This area excludes Grazing and Forest Service lands which are operated in conjunction with the patented ground. The use of Grazing and Forest Service

Table 8. *Acres of land per ranch,* 1939-1941

Kind of land	Total owned and leased land operated*					
	1939	1940	1941	Average 1939-41	Percent of total 1939-41	Leased lands 1939-41
	acres	*acres*	*acres*	*acres*	*percent*	*acres*
Cropland harvested	53.0	48.4	57.3	52.9	1.5	7.7
Idle and fallow cropland	20.2	24.7	17.6	20.8	.6	1.2
Range land						
Summer†	1,632.7	1,495.7	1,773.3	1,633.9	46.0	399.1
Spring-fall†	773.1	820.1	751.9	781.7	22.0	463.0
Winter†	956.0	965.7	1,107.8	1,009.9	28.4	351.1
Other land‡	65.0	64.3	26.7	52.0	1.5	2.4
Total land	3,500.0	3,418.9	3,734.6	3,551.2	100.0	1,224.5

* Excludes Forest and Grazing Service lands.

† Season of use was approximately June 15 to Oct. 1, summer; May 1 to June 15, spring; Oct. 1 to Nov. 15, fall; and Nov. 15 to May 1, winter.

‡ Includes non-tillable land in farms, farmstead, etc.

[4] See calculation of herd depreciation on page 37.

lands is based on privilege of grazing a certain number of animals for a specified period of time and not the privilege of using a definite parcel of grazing land as the permittee may desire.

Although only 1.5 percent of the land operated consisted of harvested cropland, the average acreage harvested per ranch, 52.9 acres, was considerably larger than the average harvested acreage for all farms in the area. One-third of the ranches had no cropland; which means that for ranches where crops were harvested there was an average of 80 acres per ranch.

Range land made up 96.4 percent of the land operated and averaged over 3,400 acres per ranch, of which more than 1,200 acres were leased. The range lands, as used in this publication, were classified by the operators according to the season of major use rather than forage types. Nearly half of all the range land, or 1,633.9 acres, was used for summer grazing of sheep and cattle; 1,009.9 acres were used for winter, and 781.7 acres for spring-fall grazing of range livestock.

The average value of cropland for the period 1939 to 1941 was $60 per acre and idle and fallow cropland, much of which was pastured, $46. Range land values were $7.38 for summer ground, $2.72 and $2.24, respectively, for spring-fall and winter grazing lands.

CAPITAL INVESTMENT

The average capital invested per ranch ranged from $40,848 in 1939 to $43,441 in 1941 (table 9). The average investment in real estate and total investment per ranch of $41,608 indicates that the typical range sheep ranch is much larger than the average of all farms in the area or state. The average investment in real estate for all farms in Utah in 1939 was $6,074, and the average value of real property for all farms in southwestern Utah was less than $5,000 per farm.[5]

The distribution of investments in real estate and grazing privileges is shown in table 10. The operator placed the value on all the

Table 9. *Capital investment per ranch*
1939-1941

Item	1939	1940	1941	Average 1939-41	Percent of total
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Real estate and range privileges	26,502	27,104	28,750	27,452	66.0
Sheep	10,425	10,095	10,895	10,472	25.2
Other livestock	1,714	1,505	1,512	1,577	3.8
Machinery and equipment	1,213	1,016	1,280	1,170	2.8
Feeds and supplies	994	813	1,004	937	2.2
Total	40,848	40,533	43,441	41,608	100.0

[5] According to 1939 Agricultural Census.

items of capital investment except for the grazing privileges. The permits for grazing on the national forests were valued at $3.00 per head for sheep and $10.00 per head for cattle. These values have

Table 10. *Average investment in real estate and range privileges,* 1940

Item	Owned	Leased	Total	Percent of total
	dollars	*dollars*	*dollars*	*percent*
Cropland	2,505	538	3,043	11.2
Range land	12,043	3,318	15,361	56.7
Other land	1,623	121	1,744	6.4
Forest Service permits	995	—	995	3.7
Grazing Service permits	2,296	93	2,389	8.8
Residence	1,821	—	1,821	6.7
Other improvements	1,751	—	1,751	6.5
Total	22,034	4,070	27,104	100.0
Percent	85.0	15.0	100.0	

developed over a period of many years and have become recognized in the industry in transfer with livestock. Permits to graze on the forest are customarily bought and sold with the livestock. The value of permits to graze livestock on Grazing Service lands has not become so well established. However, the producers of range livestock recognize that the permits have monetary value.

In the Arizona Strip area where the livestock men depend primarily on the use of public lands, Grazing Service permits for year-long grazing were sold, during the period in which this study was conducted, for as high as $35.00 for the right to graze an animal unit for a year. Livestock producers, included in this study, leased sheep and cattle grazing privileges on the Grazing Service lands. Grazing permits in the Dixie and Arizona Strip areas have been valued for purposes of this study at $22.50 for the privilege of grazing an animal unit the equivalent of one full year. Inasmuch as 5 sheep are considered the equivalent of one animal unit, grazing privileges for sheep in this area have been valued at $4.50 for a twelve months' grazing privilege. Where permits are given for only a part of the year or for less than full time on Grazing Service lands, the permits have been adjusted to the equivalent of a proportionately smaller number of stock.

In Beaver and Iron Counties grazing permits have been valued arbitrarily at $9.00 per cattle unit and $1.80 per sheep unit. In this area no records of actual sale or leasing of permits of Grazing Service privileges were found, but the general opinion of the livestock producers was to the effect that definite monetary value could be attached to these grazing privileges. No permits for year-long grazing were given producers in this area. The use of unorganized public lands in Nevada where unregulated grazing is carried on was given no value in arriving at inventory value of ranch properties.

Of the total investment in real estate and range privileges in 1940, 12.5 percent was invested in range rights on the Forest and Grazing Service lands; 56.7 percent was represented by range land; 13.2 percent in value of the operator's residence and the permanent improvements on the land. Although cropland consisted of only 1.5 percent of the area, its value was equivalent to 11.2 percent of all real estate and range privileges used by the operators of the sheep ranches. The operators owned 85 percent and leased 15 percent of the value of all real estate and range privileges.

OPERATOR'S EQUITY

Of the total average capital invested per ranch 89.1 percent was owned by the operators and 10.9 percent was leased (table 11). The average

Table 11. *Operators' investment and equity* 1939-1941

Item	1939	1940	1941	1939-41 average	Percent of total capital
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Total investment	40,848	40,533	43,441	41,608	100.0
Total leased	4,802	4,070	4,700	4,524	10.9
Operators' capital	36,046	36,463	38,741	37,084	89.1
Indebtedness					
Land	3,538	3,301	3,230	3,357	8.1
Livestock	5,546	4,796	4,708	5,017	12.0
Feed	362	360	392	371	.9
Other	290	383	450	374	.9
Total	9,736	8,840	8,780	9,119	21.9
Operators' equity	26,310	27,623	29,961	27,975	67.2

indebtedness for all the ranges was 21.9 percent of the total capital, and there was a trend for a reduction of the amount of borrowed capital with a corresponding increase in the amount and percent of the operators equity of the business. Over 85 percent of the ranches reported some indebtedness. Although most of them were in debt either for investment or operating capital the average indebtedness per ranch was not relatively large in comparison with total capital, which shows that as a group the ranches were in a relatively strong financial position. Over 50 percent of the total ranch indebtedness was secured by mortgages on livestock and more than a third was represented by real estate mortgages. The indebtedness for feed and other purposes was equal to only 4 percent of the total. The total value of leased assets was equal to approximately half of the borrowed capital. Thus, the operators' equity was equal to $27,975 per ranch or 67.2 percent of the total investment.

NUMBER OF LIVESTOCK

There was not much variation in the number and kind of livestock found on the ranches during the 3 years of this study (table 12). Beef cattle were kept on 27 percent of all ranches but were not the major

Table 12. *Average number of various kinds of livestock per ranch and percent of ranches on which they were kept* 1939-1941

Kind of livestock	1939	1940	1941	Average 1939-41	Percent of ranches keeping
	number	*number*	*number*	*number*	*percent*
Stock sheep	1,425	1,415	1,448	1,429	100
Feeder sheep	183	89	41	104	22
Beef cattle	16.6	11.7	13.8	14.0	27
Dairy cattle	4.4	3.6	4.9	4.3	76
Hogs	4.2	4.2	4.2	4.2	48
Horses	6.0	5.9	6.0	6.0	97
Poultry*	29.0	21.0	37.5	29.2	45

* Includes turkeys.

enterprise on any ranch included in the study. There was an average of 4.3 head of dairy cattle with 76 percent of all ranches reporting dairy cattle. Approximately two-thirds of this number consisted of cows kept for milk; and for the majority of the ranches the milk provided was primarily to care for the family needs. Hogs and poultry on ranches were also kept primarily for home consumption and less than half of all the ranches included in the study were keeping such livestock. Horses were found on all but one of the ranches and this one consisted of a small stock sheep enterprise only. Feeder lambs were fattened in the feed lot on 22 percent of the ranches. Most of the lambs fattened were ranch raised and not purchased from other producers of feeder lambs.

CROPS GROWN

For the three year period 1939-41, crops were harvested from an average of 52.9 acres each year (table 13). Hay crops, with alfalfa predominating, amounted to about 60 percent of the total. However, only 67 percent of all the ranches produced hay crops which would mean that there were over 45 acres of hay land per ranch where hay was produced. The other more important crops produced on the ranches were the cereals: barley, corn, wheat and oats. Approximately 40 percent of the ranches produced barley and about one-third produced wheat, oats and corn. The crops grown were mainly those needed to provide feed for the livestock rather than cash crops for sale.

The cropping program of the ranches of this area is centered around the vast area of range land that is used in conjunction with

the farm lands. An effort has been made to produce livestock feed on the tillable ground to supplement seasonal shortages of forage on the range and thereby give efficient balance to this most important range resource. Although, over 90 percent of the cropland is used for the production of feed crops, many of the ranches were buying feeds to supplement the limited local supply. A considerable volume of prepared feeds, such as cotton cake and sheep pellets, is purchased by the stockmen to carry the livestock on the range through periods of bad weather and to a limited extent for regular feeding on the range and ranch.

Table 13. *Acres of various crops grown per ranch and percent of ranches on which they were grown*

Crop	1939	1940	1941	Average 1939-41	Percent of ranches producing
	acres	*acres*	*acres*	*acres*	*percent*
Alfalfa	31.2	27.6	31.8	30.2	67.2
Other hay	1.2	1.4	2.3	1.6	9.4
Barley	6.7	4.7	8.0	6.5	42.2
Wheat	1.4	3.0	4.0	2.8	34.4
Oats	3.4	2.3	2.8	2.8	35.9
Corn	4.0	4.7	4.0	4.2	32.8
Other*	5.1	4.7	4.4	4.8	21.9
Total	53.0	48.4	57.3	52.9	

* Includes rye cut for grain, potatoes, carrots, peas, alfalfa seed, and corn pastured by livestock.

CROP YIELDS

The average crop yields in the ranches in southwestern Utah in general were much lower than the average yield of the same crops produced throughout the state. When compared with the average state yield of the same crops for the years 1926-31 equals 100, the crop yield index of these ranches for the 3 years, was 77 percent of the state average (table 14). Inadequate water supply, particularly after July, is the major factor responsible for lower yields in this area. There was considerable variation in the average yield during the 3 years. Alfalfa yields were only 1½ tons per acre compared with 2½ tons for the state as a whole. The yields of corn and corn silage were also much lower than average state yields. Barley and oat yields were higher than state average. Differences in yield from year to year may be directly attributed to differences in precipitation and water supply.

There was also considerable variation in average acreage yields within teh area. In Washington County where the growing season is much longer than in Iron and Beaver Counties, alfalfa yields were much higher than state average and it was not uncommon to find yields of

4 to 5 tons per acre. These yields, however, influenced the average yields of all ranches included in this study but little for the total acreage of hayland included in this study from Washington County was negligible when compared with the total on ranches in the two northern counties.

Table 14. *Yields per acre of important crops*

Crop	Unit	1939	1940	1941	Average 1939-41	State average yield 1926-31
Alfalfa hay	tons	1.13	1.66	1.84	1.54	2.5
Other hay	tons	.84	1.21	1.04	1.03	1.4
Barley	bu.	39	50	55	48	41
Wheat	bu.	25	22	35	27	30
Oats	bu.	43	56	57	52	39
Corn	bu.	25	18	24	22	27
Corn silage	tons	5.3	6.7	6.6	6.2	9.2
All crop index*		63	79	90	77	100

* Weighted by acres grown. State average yields 1926-31 equal 100.

RANCH RECEIPTS

Average receipts per ranch for the 3 years was $9,524 but because of changes in prices received by farmers for their products and also increased productivity of crops and livestock there was considerable variation in the total receipts (table 15). In 1939 the average receipts per ranch were $7,486, in 1940 they had increased to $8,921, and by 1941 they were $12,165. Most of this increase in receipts was from the sheep enterprise from which 90 percent of all receipts originated. Average receipts per ranch from beef cattle and crop sales were $245

Table 15. *Average receipts per ranch*

Source of receipts	1939	1940	1941	Average 1939-41	Percent of total 1939-41
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Sheep and wool*	6,668	8,133	10,987	8,596	90
Beef cattle*	270	158	308	245	3
Dairy and dairy products	127	91	124	114	1
Poultry and poultry products	46	44	87	59	1
Other livestock*	0	10	22	11	—
Crop sales	189	126	107	141	2
Change in inventory of feed and supplies†	-46	122	317	131	1
Labor off farm	121	111	105	112	1
A.A.A. payment	78	114	93	95	1
Miscellaneous	33	12	15	20	—
Total receipts	7,486	8,921	12,165	9,524	100

* Livestock sales less purchases after adjustment for inventory changes.
† Inventory decrease in 1939.

and $141, respectively. All other sources of receipts were equal only to 4 percent of the total receipts.

RANCH EXPENSES

The total operation expenses incurred between 1939 and 1941 increased from $4,218 to $5,183 per ranch, or $965 per ranch (table 16).

Table 16. *Average expenses per ranch*

Item	1939	1940	1941	Average 1939-41	Percent of total 1939-41
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Hired labor for sheep	896	1,152	1,337	1,128	24.5
Camp supplies	402	437	516	452	9.8
Feed and range fees for sheep	558	472	305	445	9.6
Misc. sheep expenses*	470	571	718	586	12.7
Machinery and equipment†	569	586	729	628	13.6
Buildings and improvements†	111	148	247	169	3.7
State and county taxes	560	488	519	523	11.3
Water assessments	93	84	85	87	1.9
General ranch expenses‡	378	371	488	412	8.9
Miscellaneous	8	3	39	17	.4
Total	4,045	4,312	4,983	4,447	96.4
Unpaid family labor (exclusive of operator)	173	122	200	165	3.6
All expenses	4,218	4,434	5,183	4,612	100.0

* Includes shearing, wool bags, twine, feed for horse with sheep, sheep association dues, etc.

† Includes repairs, depreciation, and current operating expenses for all farm enterprises.

‡ Includes crop expense, seed, feed for livestock other than sheep, labor for crops and livestock other than sheep, breeding fees, etc.

This increase in the expenses of operation was much less than the increase in receipts. For the same period of time receipts increased more than $4,500 per ranch. Principle increases in expenses were for hired labor used for sheep, camp supplies for sheep labor, and other sheep expenses. There was little change in expenses for taxes or water assessments during the period. General ranch expenses were higher in 1941 because of higher wage rates. The average total expense, $4,612 per ranch, includes all cash expenses incurred in operating the ranch business except interest paid on borrowed capital and cash rent. In order to keep all ranches on a comparable basis, they were analyzed as operating units and the leased private lands and borrowed capital have been carried the same as the operators' land and capital; therefore no interest or rent paid has been included in expenses. Expenses also include net decrease in inventories of feed and deprecia-

tion expense for the use and detorioration of the machinery, equipment and improvements. The value of family labor, other than that of the operator, used on the ranches is also included as an item of expense.

MEASURES OF FINANCIAL SUCCESS

The ranch income, which is the difference between total receipts and expenses, averaged $4,912 per ranch for the 3 year period (table 17). This is the amount of income available for payment of interest, rent,

Table 17. *Average labor earnings for operator* 1939-1941

Item	1939	1940	1941	Average 1939-41
	dollars	*dollars*	*dollars*	*dollars*
Total receipts	7,486	8,921	12,165	9,524
Total expenses	4,218	4,434	5,183	4,612
Ranch income	3,268	4,487	6,982	4,912
Interest on total capital @ 5 percent	2,042	2,027	2,172	2,080
Labor and management income	1,226	2,460	4,810	2,832
Ranch privileges*	370	386	402	386
Labor earnings	1,596	2,846	5,212	3,218

* Includes ranch produce used by the ranch family valued at ranch prices and rental value of the home calculated at 10 percent of the inventory value.

family living, ranch improvement, and other purposes for which the ranch family needs income. When interest on the average amount of capital invested in the ranch, at the rate of 5 percent, is deducted from the ranch income, there was left an average of $2,832 for the 3 year period, as labor and management income for the operator. In addition to the labor and management income of the operator the family had the privileges of the ranch house and produce from the ranch used by the household. The ranch value of this produce, primarily food, and the rental value of the house was almost $400 per ranch. This added to the labor and management income made a total for labor earnings of $3,218 per ranch. There was considerable variation in the returns to the operator during the period of time in which this study was conducted. Ranch income more than doubled from 1939 to 1941, and after deducting an allowance of 5 percent on the investment, the labor and management income was almost 4 times as high in 1941 as it was in 1939.

Another way of measuring the financial success of the ranch business is by the rate of earnings on the capital invested in the business. This is arrived at by subtracting from the ranch income the value of the operator's labor and dividing the residual by the amount of capital invested in the business. The average rate of return on the capital invested in the ranch business for 1939 to 1941 was 10.4

percent (table 18). However, in 1939 it was only 6.7 percent while in 1941 it was 14.6 percent. Both the labor income and the rate of return to capital on these ranches were higher than the average of all farms in this area or in the state for this period of time.

Table 18. *Average rate earned on capital* 1939-1941

Item	1939	1940	1941	Average 1939-41
	dollars	*dollars*	*dollars*	*dollars*
Total receipts	7,486	8,921	12,165	9,524
Total expenses	4,218	4,434	5,183	4,612
Ranch income	3,268	4,487	6,982	4,915
Value operators' labor*	526	587	632	595
Return to capital and management	2,742	3,900	6,350	4,317
Rate earned on capital† (percent)	6.7	9.5	14.6	10.4

* Value of operators' time arrived at by multiplying days of labor chargeable to the ranch by the average wage paid ranch labor. Approximately 260 days of the operators' labor were reported as being chargeable to the ranch business. The average wage used to evaluate the operators' labor was $2.00 per day in 1939 and $2.40 in the latter two years. This wage does not include any allowance for management.

† Return to capital and management divided by the total capital invested in ranch regardless of ownership of capital.

ANALYSIS OF STOCK SHEEP ENTERPRISE

RANCH ORGANIZATION AND OPERATING PRACTICES

This section of the study is restricted to the description and analysis of the stock sheep enterprise. This was the most important agricultural enterprise on each ranch, although the production of beef cattle, dairy products, farm crops, and the fattening of lambs in the feed lot were important on a number of ranches. The organization and practices adopted on established ranches generally are determined by physical environment, resources available, economic conditions of the past, and managerial ability of the operator. The operator should constantly strive to adjust his organization and practices in such a manner that a maximum return from the resources employed will be realized.

BREEDS AND BREEDING PRACTICES

Fine wool sheep predominate in this area. Breeding ewes are either straight Rambouillet or a cross of the Rambouillet and one of the medium wool breeds of which the Columbia is most popular. The fine wool breeds are particularly well adapted to the range of this area. They are hardy, can withstand adverse weather and range conditions,

are gregarious, and the ewes are good mothers. However, the cross-bred ewes, with a fine wool foundation, have some characteristics that make them more desirable than the original fine wool ewe. The cross-bred ewe has enough of the fine wool blood to maintain good flocking instincts, she is larger and more prolific than the Rambouillet. In addition her fleece is of a desirable quality with long, heavy, light shrinking wool.

The Corriedale and Panama breeds were used to some extent throughout the area. These crosses have been introduced to reduce wrinkles or folds on the typical old type Rambouillet, to increase the size of ewes and lambs, add length to the wool staple and produce a more desirable lamb for restocking of breeding flocks and for sale as feeders.

Over half of the operators were using Rambouillet rams exclusively, and all but one of the balance had Rambouillet and some rams of other breed. About one-third of the outfits had some rams of the Down breeds of which the Hampshire was most popular. The crossing of the black face rams on the cross-bred ewes produces a quick maturing lamb of desirable mutton conformation. The disadvantage in the use of black face rams is that the offspring are poor wool producers under range conditions and ewes of this cross lack herding instinct. Thus where black face rams are used it is necessary to sell all of the offspring. Breeding practices followed by producers in this area were such that sufficient white face lambs were being raised to provide replacements on practically all ranches in this area. Only one outfit, included in this study, sold all lambs produced and purchased replacement stock to maintain breeding ewe numbers. The typical range sheep producer in this area, however, does not produce his own ram replacements.

It was a general practice to condition the rams prior to the breeding season by feeding of grain. Although, it is generally accepted that breeding ewes should be in a thrifty condition and, if possible, increasing in weight at breeding time, most of the range operators were not supplementing range forage with grain or other concentrate feeds. But it is a general practice to keep the ewes on the best range available immediately preceding and during the breeding season. A few of the smaller operators kept the ewes at the ranch on feed and pasture during this season, particularly when they wanted ewes to lamb early.

The time of breeding varies with the normal condition of the range used for lambing. In southern Washington County and parts of the Arizona Strip, green feed is available 6 weeks to 2 months earlier than in the northern area; and as a result producers who lamb in the southern area put rams in the herds about the middle of October

compared with December 10 to 15 for most of the producers in the northern part of the area who lamb on the open range. The few operators who have to trail their flocks from winter ranges in eastern Nevada, normally delay breeding about two weeks longer than is the practice for flocks with shorter distance to trail. This long trail immediately preceding lambing is hard for the breeding ewes and they normally require a short period of time to recuperate prior to lambing.

LAMBING

The lambing took place on the open range for approximately two-thirds of the flocks, the balance were lambed in sheds or in farm fields. In general, it was only the smaller flocks that were lambed on feed in sheds or at the ranch. All flocks in the Dixie part of the area lamb on the open range. The sheepman uses that range which has the best combination of water, feed, and shelter from storm for lambing purposes; and plans to begin lambing as soon as the feed is available in the spring. Severe storms, delayed spring growth of feed or drought during the lambing season are some of the hazards that must be coped with in this industry. When they occur death losses of mature sheep and lambs are sometimes very heavy.

SHEARING

The time of shearing varies with the conditions in the area. In the southern section shearing takes place after lambing; but the range flocks in the area where lambing is delayed until the middle of May are most commonly shorn just prior to lambing. Practically all sheep are shorn with machine clippers. There has been a trend away from shearing at central plants and a shift to shearing with portable outfits that can move to the sheep rather than moving the sheep to the plants.

DIPPING

Dipping of the sheep for control of sheep tick is not generally practiced in the area. The area is infested with this parasite, but stockmen did not consider the results obtained from dipping worth the cost.

CULLING

All of the stockmen using the open winter ranges follow a consistent culling practice. Breeding stock is culled on the basis of age, condition of teeth, fleece characteristics, and soundness of body. The aim of the stockman in his culling practice is to eliminate all ewes that cannot reasonably be expected to live through the year, produce a good quality marketable lamb, and produce a desirable fleece.

SIZE OF FLOCK

The size of the range sheep enterprise varied from 100 to 4500 breeding ewes, with only 2 of the ranches exceeding 3,500 head. It was a general

practice for most of the operators with less than 750 breeding ewes to operate their flocks with other producers during the winter grazing season; and often for the summer season. These "coop" flocks consisted of about 2,000 ewes in the winter and 1,000 to 1,300 in the summer. This reduces the unit cost of operation for small flocks under what it would be if each owner operated alone throughout the year. Operators with 750 to 1,499 ewes generally combined flocks during the winter but all lambed their own ewes and ran them through the summer independent of other stockmen. It is also a common practice for operators to put the dry and yearling ewes in a "coop" herd to cut expenses of operation during the summertime. Much of the summer range, in this area, outside of the forest, is fenced. This makes possible the handling of smaller flocks of sheep with less labor or less dependable labor than would be required on open range.

The larger flocks were operated throughout the year as one unit. They usually put all sheep but the rams together in one or two flocks until lambing, after lambing the ewes were cared for in flocks of 1,000 to 1,300 which together with lambs make summer herds of 2,000 to 2,500 head per flock. This is about the same number of sheep that made up the usual winter flock.

The most typical size of operating unit in this area was from 750 to 1,499 head of breeding ewes (table 19). The average number of ewes in this group is 1,127 per flock, which is about the same as the 1,169 average of all flocks included in the study. The operators with less than 750 ewes made up 36 percent of the flocks used in this study but they had less than 10 percent of the total breeding ewes included.

Table 19. *Size of sheep enterprise in southwestern Utah,* 1939-1941

Number of breeding ewes in flock	Number of ranches			Total records	Average no. ewes
	1939	1940	1941	1939-41	1939-41
Less than 250	9	11	11	31	170
250 to 749	13	11	8	32	460
750 to 1499	20	26	23	69	1,127
1500 and over	13	17	17	47	2,358
All ranches	55	65	59	179	1,169

COMPOSITION OF FLOCKS

The breeding ewes comprise 82 percent of the total number of sheep in the flock (table 20). The balance consists of ewe lambs kept for replacement of the breeding ewes, rams and ram lambs kept for breeding purposes; and a few wether lambs which will either be used for mutton in the camp or home or sold the following season. The ewe lambs kept for replacing the breeding ewes made up 15 percent of the

total flock numbers. This means that between one-fifth and one-sixth as many ewe lambs are retained or purchased each year to maintain numbers of breeding ewes of desirable ages. Ram lambs were restricted primarily to smaller flocks where a few purebred sheep were produced. The usual practice of the range operator is to purchase the rams ready to breed rather than buying ram lambs or producing his own male breeding stock.

Table 20. *Composition of flocks* 1939-1941*

Kind of sheep	1939	1940	1941	Average 1939-41	Percent of total
Breeding ewes	1,167	1,158	1,186	1,169	82
Ewe lambs	220	216	222	219	15
Rams and ram lambs	38	34	34	35	3
Other	5	7	6	6	—
Total	1,425	1,415	1,448	1,429	100

* Average of numbers on hand at the beginning and end of fiscal year.

The average value of the breeding ewes was $6.99 per head and there was a tendency for the value to increase during the study which is a reflection of the increased earning power of the sheep during the period (table 21). This increase in value was particularly noticeable

Table 21. *Average value per head of stock sheep* 1939-1941

Kind of sheep	1939	1940	1941	Average 1939-1941
	dollars	*dollars*	*dollars*	*dollars*
Breeding ewes	6.65	7.03	7.22	6.99
Lamb replacements	4.58	4.85	5.98	5.15
Rams and ram lambs	14.12	14.30	14.69	14.36
Other	4.75	4.42	5.13	4.75
All	6.55	6.86	7.19	6.88

for the lambs held for replacement. The estimate of the value of the breeding ewes and rams was made by the operator, and to eliminate the influence of increased values of breeding stock on the current year's earning, the breeding stock were valued the same in the ending inventory as they were in the beginning. The value of replacement ewe lambs represents actual market value as determined by weight and market price of comparable lambs sold by the operator. This information was always available for none of the operators kept all of the ewe lambs produced.

ENTERPRISE INVESTMENT

The total capital investment of the operator in the stock sheep enterprise was $27,468 per ranch (table 22). This figure excludes the value of properties leased. The capital invested in 1941 was about

$2,600 more per ranch than in 1939. This difference was a result of increased values of sheep, additions to improvements on the range and ranch, and partially a result of having some change in ranches included

Table 22. *Average investment per ranch in the sheep enterprise* 1939-1941

Operators' investment in	1939	1940	1941	Average 1939-41	Average per ewe	% of total investment
	dollars	*dollars*	*dollars*	*dollars*	*dollars*	*percent*
Improvements	862	1,422	1,422	1,250	1.08	4.6
Land	12,183	11,936	12,637	12,243	10.54	44.5
Grazing privileges						
Grazing Service	1,955	2,309	2,232	2,175	1.87	7.9
Forest Service	699	961	954	869	.75	3.2
Sheep	9,337	9,709	10,410	9,826	8.46	35.8
Horses	230	249	265	248	.21	.9
Equipment	903	801	876	857	.74	3.1
Total	26,139	27,387	28,796	27,468	23.65	100.0

in the study. These investments represent land, equipment, improvements and other assets chargeable directly to the sheep enterprise; where any land or other assets was used for both sheep and other enterprises an effort was made to divide the value of the asset between the enterprises on the basis of use. No cropland or farm pasture was included in the sheep enterprise investment. The harvested feed and pasture were charged the stock sheep at market prices. The basis of arriving at the value of the rights or privileges to graze sheep on public ranges was discussed previously under "Capital invested in the total ranch business."

The average total investment per breeding ewe for the three years 1939-1941 was $23.65. However, this varied considerably among the ranches, for some operators owned most of the land which was needed for the stock sheep and some were almost entirely dependent upon leased or public lands. The ranchers operating on the Arizona Strip used public ranges almost entirely and consequently the capital investment per ewe was much lower in this area than in the two northern counties. This difference between the Arizona Strip area and the rest of the territory involved in this study is partially a result of differences in administrative policies of the Grazing Service. In the northern area the rights to use Grazing Service lands were associated with control of lands while on the Strip grazing rights were associated with control of water. Operators on the Strip, however, have in many cases invested considerable capital in the development of water on public lands.

LAND AND GRAZING RESOURCES

The area of range land operated per ranch (excluding public range) was 3,305 acres, of which 63 percent was owned and 37 percent was leased (table 23).

In general the seasonal grazing areas used by sheep are as follows: The summer grazing land is situated in the mountains east and south of Cedar City, where 90 percent of the operators summered their

Table 23. *Range lands used by sheep enterprise* — 1939-1941*

Kind of land†	Average 1939-41	Average value per acre	Acres per head of stock sheep
	acres	*dollars*	*acres*
Owned			
Summer range	1,280	7.77	.94
Spring-fall range	290	3.48	.21
Winter range	515	2.41	.38
Other land	5	8.72	—
Total owned	2,090	4.72	1.53
Leased			
Summer range	383	5.64	.28
Spring-fall range	387	2.31	.29
Winter range	444	1.55	.33
Other	1	10.00	—
Total leased	1,215	3.09	.90
Total land operated	3,305	4.20	2.43

* Includes leased state lands.

† Based on season during which the lands are generally grazed. All classes of land overlap to some extent.

sheep; winter range in the Arizona Strip, western Iron and Beaver Counties, and southeastern Nevada; the spring-fall feed is found on the foothills generally throughout the area (fig. 2). In moving from winter to summer grazing areas, sheep are often trailed from 75 to 100 miles. Trucking of stock between seasonal grazing areas has not become common.

The owned range was predominantly land used for summer grazing, there being 1,280 acres of owned summer range, 290 acres of spring-fall range, and 515 acres used for winter grazing. Approximately 50 percent of all the private range land was used for summer grazing of sheep. Operators were dependent on leased spring-fall and winter grazing lands to much greater extent than for the summer period. It is generally acknowledged that the deficiency in spring forage is one of the most serious problems facing the sheep industry in this area. Artificial seeding of the foothill areas and better management practices can do much toward a permanent solution of this problem.

The summer ranges, located in higher elevations, can be used only during the summer months because of snow cover the balance of the year. Winter ranges are too dry in the summer for grazing and a lack of stock water other than snow or small snow-fed streams forces

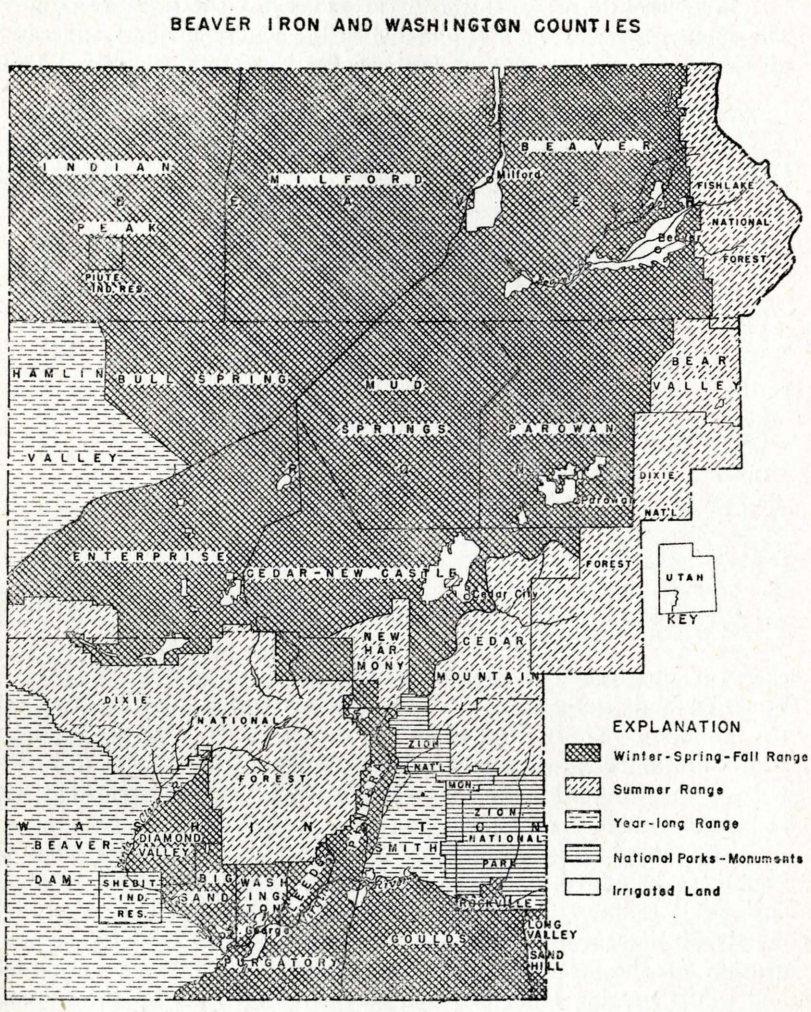

Figure 2

stockmen to restrict use of the desert lands largely to winter grazing. Much of the spring-fall range is limited to a short season of use dependent on water availability. Stockmen strive to obtain control of enough of each type of seasonal range to care for their sheep throughout the entire year. The use of public lands, farm feeds, and private lands is made in such a manner that a balance is created. If the feed and grazing resources are in good balance and seasons are normal

then each type of range is ready for use about the time the grazing should stop on other lands. Abnormal climatic conditions often affect forage growth on one type of range and disrupt the balance. For example, if forage and water are deficient on summer range, the sheep must stay on spring range longer than normal which may result in deterioration of that type of range.

The acre values, as estimated by ranch operators, indicated that owned lands were generally of better quality than leased lands. This may partially be a result of including permanent land improvements, such as fences and water developments in the value of the land. It is to be expected that owned lands would be more intensively improved than leased lands.

There was an average of 2.43 acres of private range land available for grazing each head of stock sheep using the lands. This consisted of 1.22 acres of summer land per head, 75 percent of which was owned; 0.50 of an acre of spring-fall range, and 0.71 of an acre of winter range land for each head of stock sheep on the ranch. The amount of deeded land available per head varied considerably from ranch to ranch, depending upon availability and desirability of public range lands.

For the three year period 1939 to 1941 the average number of permits issued by the Forest Service and the Grazing Service was sufficient to care for the equivalent of 825 sheep units (table 24). This would provide grazing for approximately 60 percent of the time for all of the stock sheep on the ranches. A permit to graze 1,000 head of sheep for 6 months would be the equivalent of 500 sheep units. Permits to graze on Forest Service lands would take care of all the sheep on the average ranch 5 percent of the year and Grazing Service

Table 24. *Grazing permitted on public lands for each operating unit* 1939-1941

Type of privilege	1939	1940	1941	Average 1939-41	Grazing privileges available per 100 head of stock sheep
	*sheep units**	*sheep units**	*sheep units**	*sheep units**	*sheep units**
Grazing service					
Permits to operator	712	740	726	727	53
Leased permits from other operators	5	44	37	30	2
Forest service†	50	76	75	68	5
Total	767	860	838	825	60

* A sheep unit is equivalent to one sheep in the flock for a full year.

† No forest service permits for sheep were leased by operators included in this study.

issued permits to graze the stock sheep the equivalent of 55 percent of the time. The permits to graze on forest lands by sheep were entirely for summer grazing. Grazing Service permits in the two northern counties were for winter and spring-fall use except in the Hamlin Valley Grazing Unit in the extreme western end of Iron County where there were some year-long permits. A much greater proportion of the Grazing Service permits in Washington County and the Arizona Strip were for grazing in the summer season. The leasing of grazing privileges was restricted almost exclusively to the Arizona Strip.

The Counties of Iron and Washington normally do not have sufficient forage to provide the needs of the sheep owned within the counties. These two counties are located in Grazing District 4 of Utah and comprise practically all the area of that district. In a study conducted by the Bureau of Agricultural Economics in 1939 it was shown that this district lacked 703,000 sheep-months of grazing to provide for local needs.[6] "This area has much high quality summer range on national forests and patented lands. The winter range is greater in acreage but has exceedingly low grazing capacity. Accordingly, the operators migrate extensively outside to obtain winter forage." This report also shows that only 126 of the 205 sheep operators living within the area obtained all of the grazing within the confines of this district. Sixty-eight and eight-tenths percent of the total sheep-months requirement for grazing was obtained within the boundaries of the district, and 31.2 percent was obtained outside. The adjacent areas—the Arizona Strip, Utah Grazing District No. 3, Nevada Grazing Districts No. 4 and 5, and the unregulated public domain lands of Nevada—all provide more grazing than is required by locally owned sheep. To balance the local deficiency, a part of the surplus in all of these areas was utilized by livestock producers operating from District 4.

The analysis of the ranches included in this study shows that they obtained 44.4 percent of their grazing from Grazing Service lands, 8.8 percent from unregulated public domain of Nevada, 30.9 percent from owned and leased private range, 4.3 percent from the Forest Service, and 6.3 percent from the home ranches (table 25). The sample of ranches in 1940 and 1941 was weighted a little more heavily with operators with forest permits, which accounts for the increase in grazing on forest lands as compared with 1939. The 6.3 percent of the time spent at the home ranch includes time spent on full feed as well as time in cultivated pastures. It is customary for the

[6] "Sheep migration in the Intermountain area," by H. R. Hockmuth, Earl R. Franklin, and Marion Clawson. U. S. Dept. Agr. Cir. 624. 1939.

small operators in this area to contract with other producers to care for their sheep during particular seasons of the year and 5.3 percent of the sheep were cared for under contract. These sheep were on the ranges or ranch but the details of the type of range were not available.

Table 25. *Source of grazing for sheep enterprise* 1939-1941

Type of resource	1939	1940	1941	Average 1939-41	Percent of total 1939-1941
	sheep units	*sheep units*	*sheep units*	*sheep units*	*percent*
Forest Service	42	64	69	59	4.3
Grazing Service	572	638	597	605	44.4
Unregulated public domain	144	99	121	120	8.8
Private range	429	403	432	421	30.9
Ranch	109	75	79	86	6.3
Contract care	83	67	67	72	5.3
Total sheep units	1,379	1,346	1,365	1,362	100.0

A comparison of the data in table 25 with those in table 24, which gives the grazing resources available to the operators, shows that permits issued would care for the sheep 55 percent of the year but only 44.4 percent of the year was actually spent on Grazing Service lands. However, 8.8 percent of the time of all the sheep included in the study was spent on unregulated public domain lands of Nevada where no permit to graze is required. Some operators who used the unregulated lands of Nevada had permits to graze on the organized Grazing Service lands within the southwestern Utah area. A little more than 80 percent of the permitted use of Grazing Service lands was actually utilized throughout the year. Probably more than half of the 5.3 percent of time listed as contract care was also spent on Grazing Service lands. The Forest Service issued permits sufficient to care for 5 percent of the time of the sheep but only 4.3 percent was actually spent on the forest. However, this represents about 290 head for the grazing season.

RELATION OF PRECIPITATION TO PRODUCTION FACTORS

From 1939 to 1941, there was a definite upward trend in precipitation (table 26). The year 1939 was relatively dry, 1941 unusually wet. The climatic conditions were closely associated with death losses and other factors of production. Lamb crop based on the count at market time in 1941 was 82.6 percent of the breeding ewes as compared with 69.5 percent in 1939. Or in other words, there was an increase of 13 lambs per 100 ewes. The weights of the lambs also increased, with a much greater increase between 1941 and 1940 than between 1940 and 1939. These weights are a good indication of the condition of the forage on the ranges, particularly during the spring and summer

months when the lambs were on the range. The death loss of stock sheep and lambs decreased each year of the study. Between 1939 and 1941, the decrease in death loss of mature sheep was 1.6 head per hundred and lamb losses decreased 2.2 lambs per hundred docked. Fleece weights were more variable than the other factors. Figures presented in the table are grease weights. It was not possible to determine clean or scoured weight of fleeces produced. The average grease weight of fleeces was heavier in both 1940 and 1941 than in 1939.

Table 26. *Relation of precipitation to production factors* 1939-1941

Item	unit	1939	1940	1941	Average 1939-1941
Average precipitation*	inches	8.57	9.40	16.62	11.53
Lamb crop (fall)†	percent	69.5	77.0	82.6	76.5
Lamb weights	pounds	66.0	67.0	73.0	69.0
Fleece weights	pounds	8.69	10.65	9.47	9.66
Death loss stock sheep	percent	10.0	8.6	8.4	9.0
Lambs	percent	7.5	6.6	5.3	6.4

* Average precipitation at Beaver, Milford, Cedar, Modena and St. George weather stations.

† Lamb crop as used in this bulletin is calculated by dividing lambs on hand at market time by the number of ewes on hand at the time breeding herds were made up. Adjustments in ewe numbers were made for all sales and purchases prior to lambing time.

PRICES RECEIVED

The average price received for wool by the producers in the area for the period 1939 to 1941 was 29.3 cents per pound (table 27). Price of wool in 1941 had already been influenced by the impact of the impending World War and with the higher price level associated with war. In 1939 the average price received for wool was 23.9 cents per pound, in 1940 it increased to 28.7 cents, and in 1941 had increased to 34.6 cents per pound.

Lamb prices did not increase as much as the price of wool. In 1939 the average price received per hundred weight of lambs sold by

Table 27. *Average prices paid producers in southwestern Utah for sheep and wool* 1939-1941

Item	unit	1939	1940	1941	Average* 1939-41
Wool	cents per lb.	23.9	28.7	34.6	29.3
Lambs	dollars per hundred lbs.	7.66	7.62	9.84	8.48
Ewes	dollars per head	4.03	4.00	6.57	4.83

* This is a weighted average arrived at by dividing the total dollars received during 1939 to 1941 from sheep and wool by the actual pounds or number of head sold during that period.

producers included in this study was $7.66, 1940 lambs sold for $7.62, but in 1941 the price had increased to $9.84 per hundredweight. The average price of lambs paid producers in southwestern Utah during 1939 to 1941 was 12 cents per hundred pounds lower than the average received by all producers in the state for the period 1910 to 1941.

The average price received for the sale of ewes was closely correlated with the price of lambs and wool. Ewes sold for an average of $4.03 per head in 1939, $4.00 per head in 1940, and in 1941 had increased to $6.57 per head. Most of the ewes sold were culls from the breeding herd but they included any young ewes that may have been sold for breeding purposes.

ENTERPRISE RECEIPTS

The total receipts from the sheep enterprise were $9,210 per ranch, 43 percent of which was from the sale of lambs, 13 percent from lambs held for replacement of breeding stock, 42 percent from the sale of wool and pelts, and 2 percent from miscellaneous sources (table 28).

Table 28. *Receipts from the sheep enterprise* 1939-1941

Source of receipts	Average value per ranch			Average	Percent
	1939	1940	1941	1939-41	1939-41
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Sale of lambs	3,080	3,329	5,291	3,932	43
Wool and pelts	2,861	4,156	4,469	3,861	42
Lambs held for replacement	1,043	1,103	1,575	1,240	13
Miscellaneous*	130	168	228	177	2
Total	7,114	8,756	11,663	9,210	100

* Range payments from AAA and care of sheep for other operators.

The value of the old stock sold has not been carried as a receipt to the enterprise but as an offset against depreciation of value of the breeding herd as a result of death loss and age. The receipts increased each year of the study as a result of an increase in prices of lambs and wool and also because of increased productivity. The average receipts per ranch in 1939 were only $7,114 but in 1941 they had increased to $11,663. The mutton and lambs used by the ranch family and by the laborers working with the sheep have been included in the sales. The value of sheep used in the sheep camps has also been carried as an expense for supplies.

To facilitate comparison of receipts for the different years, the receipts per breeding ewe have been calculated and are shown in table 29. The number of breeding ewes, rather than the number of sheep in the flock, was used for this comparison because of variation in the

number of ewe lambs kept for replacement on the ranches. The comparisons of receipts and also expenses can be readily made on a breeding ewe basis. The total receipts per ewe increased from $6.05 in 1939 to $9.91 in 1941, an increase of about 64 percent.

Table 29. *Receipts per breeding ewe from the sheep enterprise* 1939-1941

Source	Average per ewe*			Average
	1939	1940	1941	1939-41
	dollars	*dollars*	*dollars*	*dollars*
Sale of lambs	2.62	2.93	4.58	3.39
Wool and pelts	2.43	3.66	3.80	3.32
Lambs held for replacement	.89	.97	1.34	1.07
Miscellaneous	.11	.15	.19	.15
Total	6.05	7.71	9.91	7.93

* The number of breeding ewes at breeding time adjusted for any sales or purchases made prior to time of lambing.

ENTERPRISE EXPENSES

The average expense incurred for operating the sheep enterprise was $6,446 per ranch for the 3 year period 1939-1941. These expenses increased each year of the study (table 30) from $5,843 in 1939 to $7,132 in 1941. The principal items of increased cost were for labor

Table 30. *Expenses for the sheep enterprise,* 1939-1941

Item of expense	Average per ranch				Percentage
	1939	1940	1941	1939-41	of total expenses
	dollars	*dollars*	*dollars*	*dollars*	*percent*
Hired labor	833	973	1,169	994	15.5
Unpaid labor	368	451	497	441	6.9
Camp supplies	361	427	516	436	6.8
Equipment-Improvements*	435	568	821	611	9.5
Shearing	284	307	344	312	4.9
Herd depreciation	751	704	552	668	10.3
Interest	1,307	1,369	1,440	1,373	21.3
Taxes	309	315	331	318	4.9
Forest fees	21	33	36	30	0.5
Grazing Service fees	82	88	88	86	1.3
Leases of land and grazing privileges	206	188	244	212	3.3
Feed and salt for sheep	585	556	614	585	9.0
Feed for horses	128	152	175	152	2.3
Contract care	121	145	167	145	2.3
Miscellaneous	52	58	138	83	1.3
Total expenses	5,843	6,334	7,132	6,446	100.0

* Includes the operation of trucks and autos, freight, and custom trucking of sheep.

and camp supplies and for transportation, equipment and improvements. Most of the other expenses were relatively stable during this period. Labor cost, including camp supplies for labor, was equal to approximately 30 percent of the total expenses.

The expense for unpaid labor includes the value of the time spent by the operator and members of his family who did not draw any regular wage. The portion of the operator's time that was charged to the sheep enterprise was determined by his own estimate of the time spent with the sheep, or used in buying, selling, and in general supervision of the enterprise. Many of the operators had other farm enterprises and in some cases were engaged almost full time in non-agricultural pursuits. If the operator had no other farm enterprise or other income yielding interests, all of his time was charged to the sheep enterprise regardless of whether he was actively devoting his time to the enterprise or not. The rate of pay charged the enterprise for unpaid labor of operator and his family was set at about the average wage paid for hired labor. The value of the managerial ability of the operator, above the going wage of hired labor, will be reflected in the profits of the enterprise.

Interest on investment, which was calculated on the basis of 5 percent of the average inventory value of all capital invested in the enterprise, was equal to 21.3 percent of total expenses.

The loss to the stockmen from death of stock sheep and drop in value of cull sheep sold is one of the most important items of expense in the production of lambs and wool. For the 3 year period this expense was $668 per ranch (table 31). However, there was a decline in this expense from 1939 to 1941 of almost $200 per ranch. This

Table 31. *Herd depreciation* 1939-1941

Item	sheep	Value per ranch
	number	*dollars*
Beginning inventory	1,420	9,712
Stock sheep purchased	42	338
Total sheep to account for	1,462	10,050
Stock sheep sold*	141	719
Used in home	8	38
Ending inventory†	1,191	8,625
Total sheep accounted for†	1,340	9,382
Herd depreciation	122	668

* Includes stock sheep used in camps.

† The ending inventory of numbers and values does not include any ewe lambs produced during the year. The ewe lambs kept for replacement have been included in receipts.

resulted from decreases in death losses and improved market value of stock sheep culled from the herd and sold at the end of the production year. The value of stock sheep purchased during the year includes rams purchased for breeding purposes, ewe lambs purchased for replacement of breeding flock, and purchases of breeding ewes. Of the 1,462 head of sheep on hand or purchased all but 122 of them were accounted for in sheep on the closing inventory or those sold and eaten; and of the $10,050 value of sheep on hand at the beginning of the year's operation and those purchased during the year, all but $668 was accounted for in value of sheep sold, eaten, or kept for the next year's operation. This is the expense for herd depreciation.

The average expenses per breeding ewe were $5.55 but varied from $4.97 per ewe in 1939 to $6.06 in 1941 (table 32). The relationship of the increase in expense of operation to the increase in receipts is typical of that generally found in agricultural production during a period of rising price levels. Almost invariably prices paid for the products and consequently the receipts increase much faster than expenses. However, when prices begin to decline prices paid for products and receipts decline much more rapidly than do costs. Operators who can not keep their costs well below receipts during these periods of rising and high prices will likely find themselves in a difficult position when prices decline.

Table 32. *Expense per breeding ewe for the sheep enterprise*, 1939-1941

Kind of expense	Average per ewe			Average
	1939	1940	1941	1939-41
	dollars	*dollars*	*dollars*	*dollars*
Hired labor	.71	.86	.99	.86
Unpaid labor	.31	.40	.42	.38
Camp supplies	.31	.37	.44	.38
Equipment-improvements	.37	.50	.70	.53
Shearing	.24	.27	.29	.27
Herd depreciation	.64	.62	.47	.57
Interest	1.11	1.20	1.22	1.18
Taxes	.26	.28	.28	.27
Forest fees	.02	.03	.03	.03
Grazing Service fees	.07	.08	.08	.07
Leases of land and grazing privileges	.18	.17	.21	.18
Feed and salt for sheep	.50	.49	.52	.50
Feed for horses	.11	.13	.15	.13
Contract care	.10	.13	.14	.13
Miscellaneous	.04	.05	.12	.07
Total	4.97	5.58	6.06	5.55

The expense for labor and camp supplies was $1.62 per breeding ewe for the 3 year period and was one of the most important items of expense. This cost increased 52 cents per breeding ewe from 1939 to 1941 primarily because of rising wages. The average cash wage paid for labor with the sheep in 1939 was $60 per month but in 1941 it was not uncommon to find hired men received $80 and $85 per month. The average cost of camp supplies was about $18 for each month of labor in 1939 and approximately $25 in 1941.

There was considerable variation among the ranches in the expenses per ewe incurred in the operation of the sheep enterprises. In 1939 the expenses for 23 of the 55 ranches were less than $5.00 per breeding ewe; in 1940, 19 of 65 operators had expenses of less than $5.00 per ewe, but in 1941 only 6 of 59 operators had expenses less than $5.00 per ewe (table 33). In 1939, only 12 of the 55 ranches had expenses exceeding $6.00 per ewe, in 1940, 28 of 65 ranches exceeded $6.00 per ewe, and in 1941, 31 of 59 ranches had costs exceeding that amount.

Table 33. *Variation in expenses per breeding ewe* 1939-1941

Total expense of operation per breeding ewe	Number of records				Percentage of total 1939-41
	1939	1940	1941	1939-41	
dollars	*number*	*number*	*number*	*number*	*percent*
Less than 4.50	12	6	2	20	11.1
4.50 to 4.99	11	13	4	28	15.7
5.00 to 5.49	12	13	12	37	20.7
5.50 to 5.99	9	5	10	24	13.4
6.00 to 6.49	4	11	11	26	14.5
6.50 to 6.99	1	5	7	13	7.2
7.00 to 7.49	3	4	3	9	5.1
7.50 to 7.99	1	2	2	5	2.8
8.00 or more	3	6	8	17	9.5
Total	55	65	59	179	100.0

The variations in costs are a result of differences in size of operating units, in the production practices, and in general efficiency of operation and management. Those ranches with little fixed investment and no supplemental feeding had relatively low expenses for operation whereas small flocks kept on the farm during the winter on harvested feeds invariably had high expenses.

PROFITS FROM THE ENTERPRISE

After paying all the expenses including imputed wages for the operator and members of his family and interest on operator's capital, there was left an average of $2,764 profit per ranch or $2.38 per breeding ewe (table 34 and fig. 3). While total expenses increased $1,289

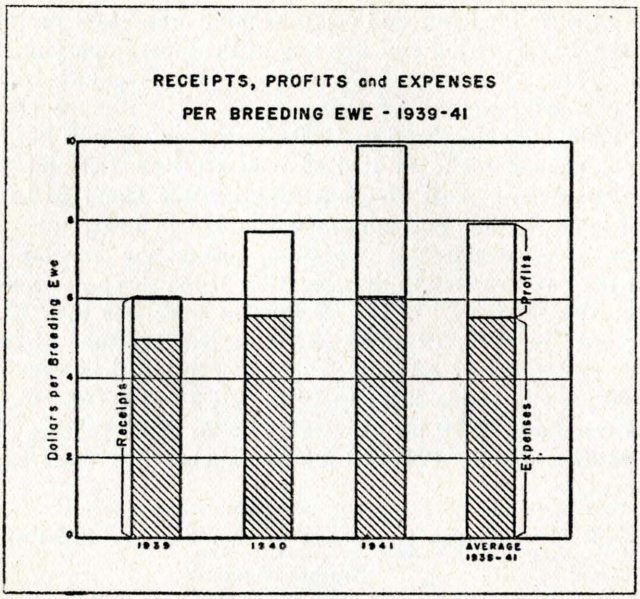

Figure 3

per ranch from 1939 to 1941 the total receipts increased an average of $4,549 per ranch. In 1939 the net profit of the enterprise was $1,271 per ranch, in 1940 it had approximately doubled, but in 1941 it was $4,531 per ranch or an increase of 356 percent of the 1939 figure. The range in profits per enterprise was from $12,898 to a loss of $263 for the year 1941.

In each of the years at least one operator failed to make a profit from the sheep enterprise, but where there was only one such operator

Table 34. *Financial summary of sheep enterprise* 1939-1941

Item	1939	1940	1941	Average 1939-41	Average per ewe 1939-41
	dollars	*dollars*	*dollars*	*dollars*	*dollars*
Total receipts	7,114	8,756	11,663	9,210	7.93
Total expenses*	5,843	6,334	7,132	6,446	5.55
Net profit*	1,271	2,422	4,531	2,764	2.38
Profit per ewe*	1.08	2.13	3.85	2.38	—

* The expenses include ranch wages for the time the operator spent working with the sheep and giving supervision to the enterprise. The net profit is the reward to the operator for his management and bearing the risks incurred in conducting the business.

in 1941 there were 12 in 1939 (table 35). For the year 1941 more than half of the operators made a profit of more than $4.00 per breeding ewe and only three had a profit of less than $2.00 per ewe; but in 1939 only two operators had a profit exceeding $4.00 per head and more than 75 percent had less than $2.00 per ewe profit. The differences in profits per ewe are associated with size of the enterprise, rates of production of lambs and wool, death losses, costs of production, and general efficiency in the organization and operation of the enterprises. Some of these relationships are shown in the next section of this report.

Table 35. *Variation in profit per breeding ewe* 1939-1941

Profit per breeding ewe	Number of records				Percent of total
	1939	1940	1941	1939-41	1939-41
dollars	*number*	*number*	*number*	*number*	*percent*
Less than -1.00	4	2	1	7	4
-1.00 to -.01	8	0	0	8	4
0.00 to .99	16	6	1	23	13
1.00 to 1.99	15	18	1	34	19
2.00 to 2.99	7	25	13	45	25
3.00 to 3.99	3	11	12	26	15
4.00 to 4.99	2	3	14	19	11
5.00 to 5.99	—	—	11	11	6
6.00 or more	—	—	6	6	3
Total	55	65	59	179	100

ANALYSIS OF SOME FACTORS AFFECTING COST AND RETURNS

IT IS not always possible to obtain one measure that is entirely satisfactory in measuring the success of an enterprise. Particularly is this so when one is dealing with individual enterprises; as the primary objective of the operator is to obtain the highest possible income from the entire business. It is not always desirable to obtain the highest possible returns from any single enterprise if, thereby, the returns in other important enterprises are sacrificed. The income of the rancher is determined not only by the efficiency of each of the enterprises involved but by the number and size of enterprises included in the total business and the over-all efficiency with which the total business is operated.

For purposes of this analysis, the profit obtained per breeding ewe will be used as the measure of success of the individual enterprise. Although it is recognized that it is not satisfactory in all respects, this measure does lend itself to comparison of enterprises of different sizes and also for comparison of ranches which are not uniform in practice followed in replacement of breeding flocks.

NUMBER OF BREEDING EWES

The size of the enterprise is one of the most important factors influencing the cost of production as well as profit from sheep. There was some variation in the relationship between number and profit per ewe during the 3 years of the study. In 1941, which was one of the most favorable production years in this area, the profit per ewe on the ranches with less than 250 breeding ewes was $4.89, and was higher than for any of the other groups. For the year 1939 the profit per ewe for the small groups was only 30 cents and was the lowest for all groups. In all years except 1939 the largest ranches had the smallest return per ewe.

The expenses per breeding ewe tend to decrease as the number of ewes increases. Larger flocks can use labor and equipment more efficiently than small flocks and have some advantages in large-scale buying of supplies, but because of lower productivity in larger ranches the profit per ewe was less than that received by operators of smaller flocks even though expense of operation was considerably less than for the smallest flocks (table 36). The total enterprise profit per

Table 36. *Relation of number of ewes per ranch to investment expenses and profits* 1939-1941

Breeding ewe per ranch		Investment per ewe			Expense per ewe	Profit	
Range	Average	Land	Range privileges	Total		Per ewe	Per ranch
Less than 250	170	15.10	1.58	28.45	7.28	2.70	460
250 to 749	460	10.20	1.93	22.40	6.03	2.44	1,125
750 to 1499	1,127	11.12	2.19	24.15	5.56	2.61	2,945
1500 or more	2,358	10.05	3.02	23.19	5.09	2.17	5,145
All ranches	1,161	10.54	2.62	23.65	5.55	2.38	2,764

ranch was $460 for the smallest group, $1,125 for the next smallest, and $5,145 per ranch for the largest group. There was no significant difference in the total amount of capital invested per breeding ewe for all size groups other than the smallest, which group had almost $5 more per ewe invested in the enterprise than the average of all flocks. However, the investment in privileges to graze on public lands increased as the number of ewes in the flock increased. The group of ranches with more than 1500 ewes had almost twice as much invested per ewe in range rights as those with less than 250 ewes.

The lamb crop, weight of lambs at market time, and fleece weights, all of which are important factors influencing gross returns, decreased as the size of flock increased (table 37). Ranches with less than 250 ewes had an average fall lamb crop of 89.7 percent, the next larger group had 82.5 percent. The group with 750 to 1500 breeding ewes,

the most typical of all sizes, had a lamb crop of 80 percent and those ranches with over 1500 ewes had a crop of only 73.5 percent. The average fleece weight decreased from 10.5 pounds for the smallest flocks to 9.4 pounds for flocks with the largest number of breeding ewes.

Table 37. *Relation of number of ewes per ranch to productivity, mortality, and labor efficiency* 1939-1941

Number of breeding ewes per ranch Range	Ewes per ram	Sheep per man	Death loss		Fall lamb crop	Lamb weight	Fleece weight
			Stock sheep	Lambs			
		number	*percent*	*percent*	*percent*	*pounds*	*pounds*
Less than 250	44	533	7.9	6.2	89.7	76	10.5
250 to 749	42	674	8.3	6.7	82.5	70	10.1
750 to 1499	38	745	7.7	5.4	80.0	71	9.8
1500 or over	35	764	10.0	7.4	73.5	65	9.4
All ranches	37	745	9.0	6.4	76.5	69	9.7

The smaller ranches used fewer rams per hundred ewes for breeding. This was possible because of different practices followed at breeding time. More of the smaller ranches kept the flocks on the ranch at breeding time, where it was practical to remove the rams periodically and give them rest and grain while not in service. One operator with almost 750 breeding ewes, used only 1 ram to 75 ewes. He removed the rams every 12 hours and after 12 hours of rest and good feed they were put back in the flock.

On this ranch, the fall lamb crop exceeded 120 percent each year of the study. The customary breeding practice on the range, where most of the larger flocks were bred, was to put about half the rams in the herd at the beginning of the breeding season and retain the balance of the rams 10 days or two weeks; then the fresh rams were put in the herds and no more special care was given the rams during the breeding season.

There was no consistent relationship between the size of flocks and death loss in stock sheep or lambs. However, death loss among the largest flocks was greater than that suffered by the three smaller groups.

As the size of the flocks increased, particularly up to 1500 ewes, operators were able to handle more sheep per man employed. On the larger ranches each man cared for an average of 764 head of sheep; and on the group of ranches with from 750 to 1499 head of ewes each man was taking care of 745 head. For the ranches with the smallest flocks only 533 head of sheep were cared for per man employed. Each man working with the sheep on the larger ranches cared for 43 percent more sheep than the equivalent amount of labor on the smallest ranches.

LAMB CROP

The success or failure of the sheep enterprise is closely related to the number of lambs raised to market age from a given number of ewes. Of the one-third of the ranches included in this study with the lowest fall lamb crop, 64.9 percent had an average profit for the 3 years of $1.69. Of the one-third of the ranches with the highest lamb crop, 96 percent had a profit of $3.34 per ewe, or almost twice the profit per ewe of the least productive ranches (table 38). The fall lamb crop, as

Table 38. *Relation of lamb crop to various factors* 1939-1941

Fall lamb crop		Average number ewes	Death loss lambs	Lamb weights	Pounds of lamb per ewe	Expense per ewe	Profit per ewe
Range	Average						
	percent	*number*	*percent*	*pounds*	*pounds*	*dollars*	*dollars*
Lower third	64.9	1,623	8.9	66	42.8	5.30	1.69
Average third	79.8	1,133	5.1	67	53.5	5.47	2.70
Upper third	96.0	744	3.8	74	71.0	6.20	3.34
All ranches	76.5	1,161	6.4	69	52.5	5.55	2.38

calculated in this study, is based on the number of breeding ewes in the flock at breeding time less the number of ewes sold prior to lambing and the number of lambs on hand at market time. This is not the way some operators calculated their lamb crop. In speaking of the percent of lamb crop some base their calculations on the tail count at docking time and others count only the wet ewes at docking time but do not count the dry ewes. Ranches with the least lambs per 100 ewes had 1,623 ewes that should have lambed whereas the group of ranches with the greatest lamb crop had only 744 ewes, which indicates that it is more of a problem on larger outfits for the operator to give the same personal attention to all the details and this apparently results in a lower percent lamb crop. The more productive flocks produced an average of 71 pounds of lamb for each ewe in the flock at breeding time. The flocks with the least lamb crop produced only 42.8 pounds of marketable lamb, or in other words, two-thirds more lamb per ewe was produced by the more productive flocks than by flocks with the lowest lamb crop.

In an effort to eliminate the effect of the inter-relationship between the size of the flock and lamb crop, a sort was made showing the relationship of the lamb crop to various factors for flocks of the same relative size. For the small ranches, one group of which had 496 ewes and the other 465, the low lamb crop group had 73 lambs per hundred ewes and the group with the high lamb crop had 100 lambs per hundred ewes (table 39). This was associated with a difference of almost $1.50 profit per ewe. The feed cost was higher per ewe for

those getting the most lambs and death loss of lambs considerably lower. High lamb crops were also associated with use of private range. For the flocks with the highest lamb crop, 59 percent of their

Table 39. *Relation of lamb crop and number of ewes per ranch to various factors* 1939-1941

Fall lamb crop Range	Average	Number ewes	Feed cost per ewe	Death loss lambs	Use of range* Public	Private	Expense per ewe	Profit per ewe
	percent	*number*	*dollars*	*percent*	*percent*	*percent*	*dollars*	*dollars*
			Small ranches					
Low	73.0	496	.63	7.3	51	39	5.83	2.05
High	100.0	465	1.46	4.0	22	59	6.71	3.53
			Large ranches					
Low	66.2	2,040	.37	8.2	65	33	5.35	1.89
High	84.1	1,629	.27	5.2	60	36	5.40	2.77
All ranches	76.5	1,161	.47	6.4	54	37	5.55	2.38

* Balance of time spent at the ranch on pastures or dry feed; or were being cared for under contract by other operators.

forage was obtained from private range and those with low lamb crop obtained more than half of their forage from public range. The increase in expenses per ewe for the group with highest lamb crop was essentially the same difference as was found in the additional expense for feeding.

There was also considerable variation in the number of lambs produced per 100 ewes on the large ranches. The half of the large ranches with the highest lamb crop had 84.1 lambs at market time compared with 66.2 lambs for those with the lowest lamb crop. The difference in profit per breeding ewe was 88 cents per ewe in favor of the ranches with the highest lamb crop. Death loss of lambs was lower on the ranches with high lamb crop but expenses of operation were slightly higher. The feed cost per breeding ewe was less for the flocks producing the most lambs. However, few of the larger flocks were feeding stock sheep for high production. Feed on most of the the larger outfits was primarily for the purpose of carrying the stock through periods when serious weather conditions were encountered. The more productive flocks also spent more time on private range but the difference was not as great as for small ranches.

These data indicate that there is opportunity on most of the ranches, large and small, to increase materially the number of lambs produced from the breeding flock, and in accomplishing this lies one of the greatest possibilities of increasing the returns. How this may be accomplished on an individual ranch cannot be stated in general

terms for it involves a detailed analysis of conditions on each ranch and may necessitate changes in many of the practices now followed.

NUMBER OF RAMS

Apparently there has been no tendency for ranchers to use too few rams. Those flocks using the fewest rams per 100 ewes had the highest lamb crop at docking time and those using the most rams had smaller lamb crops (table 40). However, it is quite likely that the lamb crop both at docking time and in the fall is more directly the result of differences in other practices followed by operators of flocks of different sizes than to the number of rams used.

Table 40. *Relation of rams per* 100 *ewes to various factors* 1939-1941

Rams per 100 ewes		Average number ewes	Lamb crop at docking	Fall lamb crop
Range	Average			
	number	*number*	*percent*	*percent*
Least third	2.1	729	88.9	84.1
Average third	2.6	1,419	80.6	75.8
High third	3.3	1,331	79.3	73.4
All ranches	2.8	1,161	81.8	76.5

LAMB WEIGHTS

The relationship of the average weight of lambs to the profit per ewe and other factors is shown in table 41. The weight of lambs given is the average weight of all lambs sold at market time. Weights for the lambs which were kept for dry lot feeding were estimated by the operator. They were obtained at the time the lambs were segregated or cut from the ewes and either sold or put in the feed lot. There was a difference of 18 pounds per lamb at market time between ranches with the heaviest lambs compared with those with the lightest lambs. The heaviest lambs tended to be found on the ranches with the fewest

Table 41. *Relation of weight of lambs to various factors* 1939-1941

Lamb weight		Number breeding ewes	Average fleece weight	Feed cost per ewe	Grazing on private land	Lamb* receipts per ewe	Profit per ewe
Range	Average						
	pounds	*number*	*pounds*	*dollars*	*percent*	*percent*	*dollars*
Lightest third	61	1,283	9.3	.26	32	3.80	2.06
Average third	68	1,307	9.6	.41	34	4.46	2.31
Heaviest third	79	895	10.2	.83	47	5.37	2.92
All ranches	69	1,161	9.7	.47	37	4.46	2.38

* Includes the value of lambs held for replacements of the breeding flocks as well as those sold.

number of breeding ewes. The average fleece weight and lambs produced per 100 ewes were also higher on ranches with the heavier lambs. All of these factors influence the profit per ewe. Therefore the difference of $0.86 per breeding ewe between lightest and heaviest lambs could not all be attributed to the difference in the weights of the lambs.

The feed cost per breeding ewe was higher on ranches with the heaviest lambs. The ranches that practiced shed lambing and lambed early in the season would all be included in this group. This practice is possible on a few ranches; but with a general deficiency of hay and grain to care for the numbers of livestock produced in southwestern Utah, it is not economically feasible for the majority of the ranches to adopt the practice of shed lambing or lambing earlier in the season. The time of lambing for the majority of the range sheep in this area must await the normal season when range forage is available.

FLEECE WEIGHTS

The weight and value of the fleece is an important factor influencing financial returns. In this study wool and pelts were a source of 42 percent of the total receipts and when the value of the wool on the lambs and other sheep sold is taken into consideration the wool crop constitutes more than 50 percent of the total receipts of the enterprise. There was considerable variation in the average fleece weight found in the flocks of this area. Some flocks sheared as high as 13 pounds per sheep and others sheared as low as 7 pounds. The third of the ranches with the heaviest fleeces was producing 2.9 pounds of wool per fleece more than the third with the lightest fleeces (table 42). The larger ranches tended to have the lightest shearing sheep. However, there were some larger operators with fleece weights considerably above the average. Average fleece weights of sheep ranged on the Arizona Strip and Washington County the major portion of the time were below weights for the entire southwestern Utah area. The average fleece sold for $2.83 and there was a difference of 69 cents per fleece between the lightest and heaviest groups. The average profit per ewe for flocks

Table 42. *Relation of fleece weight to various factors* 1939-1941

Fleece weight Range	Average	Breeding ewes per ranch	Average value of fleece	Wool price per lb.	Receipts per ewe	Expense per ewe	Profit per ewe
	pounds	*number*	*dollars*	*dollars*	*dollars*	*dollars*	*dollars*
Lightest fleeces	8.4	1,376	2.52	.299	7.54	5.29	2.24
Average fleeces	9.9	1,272	2.92	.293	8.06	5.73	2.33
Heaviest fleeces	11.3	840	3.21	.284	8.37	5.70	2.67
All ranches	9.7	1,161	2.83	.293	7.93	5.55	2.38

producing the lightest fleeces was $2.24 per head compared with $2.67 for the flocks with heaviest fleeces.

The method of marketing wool influences to some extent the value of the fleece. The producers who marketed their wool through producers cooperative wool marketing associations during these 3 years obtained 2.2 cents per pound more than the average received by all producers (table 43).

Table 43. *Relation of wool marketing agencies to various factors*

Sold through	Number records	Fleeces sold per ranch	Wool price per pound	Average fleece weights	Value of fleece
	number	*number*	*cents*	*pounds*	*dollars*
Producers' cooperatives	66	1,442	31.5	10.0	3.15
Private auction agency	29	1,412	30.4	9.2	2.81
Others and unclassified	86	1,272	26.9	9.5	2.56
All ranches	179	1,356	29.3	9.7	2.83

This should not be construed, however, to infer that one will always get higher receipts by selling through any one agency. And it should also be borne in mind that these figures are on grease basis and not on the amount of clean wool in the fleeces; nor is the grade of the wool handled by the various agencies known. But these figures do definitely indicate that there may be some opportunity for producers to increase their earnings by more careful study and analysis of various wool marketing agencies and methods of marketing wool.

DEATH LOSSES

The difference between the opening and closing inventory of numbers of sheep, exclusive of natural increase, after taking into account the purchases and sales and the number used for meat on the ranch and in the camps has been considered as the death loss of the stock sheep. It is the number of sheep unaccounted for during the year and for all practical purposes it is the death loss. The third of the ranches with the highest death loss lost 12.6 percent of stock sheep during the year as compared with a loss of only 5.1 percent for the ranches with least losses (table 44). The highest losses tended to be found on the larger ranches. An effort was made to determine the cause but it was not possible to obtain complete information covering all losses. The principal known causes as given by the operator were poison plants and predatory animals. The number of animals that strayed or died from unknown causes was greater than the number that died from known causes. In no parts of the area was loss by predatory animals mentioned as being particularly serious except in the summer range areas

adjacent to the public parks where hunting and trapping of predatory animals is restricted.

Table 44. *Relation of death loss of stock sheep to various factors* 1939-1941

Death loss stock sheep		Average number	Death loss	Feed cost	Herd depreciation	All expenses per	Profit per
Range	Average	stock	lambs	per ewe	per ewe	ewe	ewe
	percent	*number*	*percent*	*dollars*	*dollars*	*dollars*	*dollars*
Highest third	12.6	1,490	7.4	.38	.82	5.54	1.99
Average third	8.2	1,438	6.2	.53	.52	5.67	2.49
Least third	5.1	1,155	5.5	.51	.32	5.41	2.78
All ranches	9.0	1,362	6.4	.47	.57	5.55	2.38

In an effort to limit losses through the winter, practically all the operators using open range followed the practice of culling all old ewes from the winter herd. The expense for herd depreciation was closely associated with percent death loss in the stock sheep. The group with the highest loss had an average expense of 82 cents per ewe for herd depreciation as compared with 32 cents per ewe for those with the least losses. The amount of labor used with the sheep was 8 percent higher for flocks with the least losses and 4 percent higher for flocks with average losses than that used for flocks with the highest losses.

The profit per breeding ewe varied from $1.99 to $2.78 per ewe with an average of $2.38 for all ewes. Part of the difference of 79 cents per ewe additional profit for the ranches with the least death loss as compared with high death loss flocks is a result of higher per unit receipts. There is not only an economic loss from the death of the sheep but there is no lamb income from most of the ewes and quite frequently there is no income from wool or pelts.

Death loss in the lambs from the time of docking to marketing was not included in death loss of stock sheep. There is a fairly close relationship between the death loss of the lambs between the docking and market time and the profit per ewe. The group of ranches with the

Table 45. *Relation of death loss of lambs to various factors* 1939-1941

Death loss of lambs		Number	Fall lamb	Lamb	Lamb	Proportion time on public	Feed	Profit per
Range	Average	ewes	crop	crop docking	receipts per ewe	range	cost ewe	ewe
	percent	*number*	*percent*	*percent*	*dollars*	*percent*	*dollars*	*dollars*
Highest third	10.9	1,253	70.2	78.8	4.08	60	.37	2.15
Average third	5.6	1,126	76.1	80.6	4.31	47	.47	2.27
Least third	2.5	1,104	84.3	86.5	5.04	37	.57	2.77
All ranches	6.4	1,161	76.5	81.8	4.46	49	.47	2.38

least losses in lambs had a profit of $2.77 per ewe, and the ranches with the highest losses had a profit of $2.15 per ewe (table 45). There was a fairly close association between the death loss of lambs and the proportion of time the flocks spent on public ranges. Flocks with the highest death losses spent 60 percent of their time on public ranges and had the least feed cost per ewe, while those with the least losses spent only 37 percent of their time on public ranges and had the highest feed cost per breeding ewe.

FEED COSTS

Feeding of stock sheep was more common on ranches with smaller flocks. A few of the small flocks were fed through the winter at the ranch and lambed in the sheds. The group of ranches that fed the greatest amount of feed per stock sheep had a feed cost of $1.43 per head, and there was an average of 672 ewes in the flocks; while those that fed the least feed per head, 8 cents per head of stock sheep, had 1,479 breeding ewes per flock (table 46). The principal feeds fed the

Table 46. *Relation of feed cost per head of stock sheep to various factors* 1939-1941

Cost of feed* per head		Average no. of	Fall lamb	Death loss of	Lamb	Investment per ewe	Expense per	Profit per
Range	Average	ewes	crop	sheep	weight	G. S. priv.	ewe	ewe
	dollars	*head*	*percent*	*percent*	*pound*	*dollars*	*dollars*	*dollars*
Least third	.08	1,479	74.8	9.2	66	2.59	4.97	2.39
Average third ..	.34	1,340	76.6	8.9	67	1.62	5.64	2.17
High third	1.43	672	84.1	8.4	76	.82	6.64	2.78
All ranches	.47	1,161	76.5	9.0	69	1.87	5.55	2.38

* Feed costs as used here include all purchased feeds and ranch-grown harvested feeds; but excludes costs for grazing fees, leases and pasture.

stock sheep in this area were barley, oats, hay, corn, silage, and prepared feeds such as cottoncake and sheep pellets. Few of the larger operators fed flocks as a regular practice. Rams were generally fed a month or two before breeding time and a few producers fed the ewes during lambing time. The general procedure of the range operators in this area has been to feed on the range only when they encountered critical forage shortages or when "snowed in" with severe storms, rather than feeding livestock for increased production of lambs and wool.

The groups of ranches where the least and average amount of feed were fed per ewe are comparable in that they are essentially the same size and both groups were made up primarily of range outfits. For these two groups of ranches, the fall lamb crop was higher by 1.8

percent for the group feeding the most per ewe. Death losses of lambs and stock sheep were also slightly lower for the group feeding the most. Lamb weights were about the same for both groups of ranches; and yet the profit per ewe was higher by 22 cents for the group feeding the least. The difference in profits between these two groups of ranches can be more readily accounted for in expenses of operation. The difference in total expenses, 67 cents per breeding ewe, was not entirely the result of difference in amount of feed fed but to other factors which may or may not have been related to the amount of feeding done.

LABOR EFFICIENCY

The efficiency in the use of labor on the sheep enterprise is apparently more dependent on the size of the flock than any other factor (table 47). The group using man labor most efficiently had an average of

Table 47. *Relation of labor efficiency to various factors* 1939-1941

Sheep per man		Size flock	Labor cost per ewe	Equipment transportation cost ewe	Fall lamb crop	Death loss stock sheep	Profit per ewe
Range	Average						
	head	*number*	*dollars*	*dollars*	*percent*	*percent*	*dollars*
Least third	577	669	1.41	.58	79.1	8.1	2.04
Average third	715	1,674	1.28	.53	74.4	9.3	2.19
Highest third	861	1,768	1.12	.50	79.5	9.0	2.71
All ranches	745	1,362	1.24	.53	76.5	9.0	2.38

1768 stock sheep in the enterprise; and for each man employed with the enterprise an average of 861 sheep was cared for. For the group with the lowest labor efficiency, with an average of 669 sheep in the flock, the average man employed cared for only 577. The same situation that is favorable for economy in the use of labor is also favorable for efficient use of equipment and machinery. Generally the same ranches that were efficient in the use of labor had lowest costs for equipment and transportation. An analysis of these flocks for labor efficiency shows that there is considerable opportunity for increasing efficiency in the use of labor and equipment without suffering loss of productivity. The ranches most efficient in the use of labor were almost 2½ times the size of the ranches with the least efficient labor. The fall lamb crop was higher for that group than the others. The average profit per ewe varied for these groups from $2.71 down to $2.04, a difference of 67 cents between the average of the groups, whereas a difference in labor cost alone was only 29 cents per ewe.

INVESTMENT IN LAND

The percent of total investment in land varied from nothing to 70 for ranches included in the study. The average investment for all ranches was 44.6 percent of the total enterprise investment (table 48). The average investment in land was $2.61 per ewe for the group

Table 48. *Relation of percent of investment in land to capital investments per ewe and grazing privileges on public lands* 1939-1941

Percent of investment in land*		Average number ewes	Investment per ewe			Public range permits per 100 head
Range	Average		Land	Range rights	Total	
	number	*number*	*dollars*	*dollars*	*dollars*	*sheep units*
Least third	15.9	1,177	2.61	3.88	16.42	92
Average third	46.7	1,113	10.90	2.27	23.30	53
Highest third	57.4	1,194	17.65	1.76	30.74	39
All ranches	44.6	1,161	10.54	2.62	23.65	60

* Includes only the land owned by the operator.

with the smallest investment and $17.65 for the group with the highest investment. The average investment in land per breeding ewe for all ranches was $10.54. The ranches with the smallest proportion of the enterprise investment in land had the highest investment in range rights; indicating they were much more dependent upon public land for forage than those with a greater investment in land. Permits issued to graze on public range to the groups of ranches with the least investment in land were sufficient to take care of the stock sheep 92 percent of the time. The ranches with the highest percent of the capital invested in land had permits to graze on public range to take care of their stock sheep 39 percent of the time. A considerable portion of the permits to graze on public range was not used by the ranches with the least investment in land. The group of ranches, with the greatest investment utilized practically all of the permitted use on public range administered by Grazing Service and Forest Service and

Table 49. *Relation of percent of total investment in land to various factors* 1939-1941

Percent investment in land	Fall lamb crop	Lamb weight	Fleece weight	Death loss		Expenses per ewe	Receipts per ewe	Profit per ewe
Range				Stock	Lambs			
	percent	*pounds*	*pounds*	*percent*	*percent*	*dollars*	*dollars*	*dollars*
Least third	75.5	66.1	9.2	9.6	8.2	4.98	7.32	2.34
Average third	78.0	70.0	9.7	8.8	5.3	5.55	8.09	2.54
Highest third	76.2	69.5	10.0	8.5	5.8	6.08	8.35	2.27
All ranches	76.5	68.6	9.7	6.4	9.0	5.55	7.93	2.38

then spent 15 percent of their time on unregulated public domain lands.

There was apparently no significant relationship between the percent of the total enterprise invested in land and most of the production factors which influence expenses and returns from the enterprise. There was consistent relationship between the death loss of stock sheep and the proportion of the investment in land. Those with smallest investment had high death loss of stock sheep and also the highest death loss among the lambs (table 49). Although the expenses and receipts per breeding ewe were lower for flocks with the smallest investment in land the variation was such that there was no significant difference in the profit per ewe.

USE OF GRAZING SERVICE AND PUBLIC DOMAIN

The use made of Grazing Service land and unregulated public domain of Nevada was quite closely correlated with size of the enterprise. Fifteen ranches that spent no time on public domain had an average of only 367 ewes, and the 23 ranches spending the most time on those lands had an average of 1,762 ewes per ranch (table 50).

Table 50. *Relation of proportion time on Grazing Service and public domain to various factors* 1939-1941

Proportion time on GS and public domain		Number of ewes	Fall lamb crop	Lamb weight	Fleece weight	Death loss		Profits per ewe
Range*	Average					Stock sheep	Lambs	
	percent	*number*	*percent*	*pounds*	*pounds*	*percent*	*percent*	*dollars*
None	0	367	96	76	10.1	8.3	4.2	3.01
1 - 54.9	45	1,084	78	71	10.1	8.3	6.2	2.53
55 and more	66	1,762	73	65	9.4	9.2	6.7	2.20
All ranches	54	1,161	76	69	9.7	9.0	6.4	2.38

* There were 15 flocks spending no time on the Grazing Service, 22 spending less than 55 percent, and 23 spending more than 55 percent.

The 15 ranches that are recorded as spending no time on Grazing Service or unregulated public domain land probably did make some use of these lands. It was quite common for many small operators to combine their flocks with flocks of other producers to make up a herd large enough to operate economically on the range. The sheep were cared for at a contract price per month. No record was available of type of range used during the time the sheep were cared for by individuals other than the owner. Actually, the sheep in this first group were cared for in "coop" herds under contract 35 percent of the time. For the other 2 groups of ranches less than 5 percent of the stock sheep was cared for under contract by other individuals.

More valid comparison can be drawn between the groups spending 45 percent and 66 percent of their time on Grazing Service and unregulated public domain lands even though there is some difference in the number of ewes in the flocks. Lamb crop was lowest, lamb and fleece weights lightest, death loss of stock sheep and lambs was higher for those ranches spending the greater proportion of their time on the public lands. Expense of operation for the group spending the most time on public ranges was 53 cents per ewe less, the receipts were 86 cents less, and consequently the profit per breeding ewe was less by 33 cents. Because of difference in the size of flocks, however, the average total profit was $3,881 per ranch for the group using public lands for grazing the most as compared with an average profit of $2,742 for the other ranches using public lands. The average profit for ranches which did not use public grazing lands was only $1,106 even though the profit per ewe was much higher than the average obtained for all ranches.

NUMBER OF FACTORS BETTER THAN AVERAGE

The financial returns from an enterprise are associated with many factors, each acting somewhat independently of the others. All of them can be important in determining the financial success of the operators but no one item can usually be emphasized at the expense of others. It is generally desirable that all of the important items that influence costs and returns should be maintained at relatively favorable levels. In order to show the cumulative effects of better than average performance the records were rated in six selected factors in which they were better than average. The six factors were: fall lamb crop, lamb weight, fleece weight, death loss of stock sheep, death loss of lambs, and labor efficiency. The records were divided into two groups in an attempt to eliminate some of the influence of size of the enterprise and its influence

Table 51. *Relation of number of factors above average to profit per ranch and per ewe in smallest flocks* 1939-1941

Number of factors above average	Records	Ewes per ranch	Profit per ewe	Profit per flock
	number	*number*	*dollars*	*dollars*
0	6	821	.40	325
1	17	506	1.90	963
2	20	467	2.28	1064
3	13	567	2.85	1616
4	37	568	3.45	1962
5	6	443	3.84	1700
All ranches	99	549	2.66	1448

Factors are: Fall lamb crop, lamb weight, fleece weight, death loss stock sheep, death loss lambs, and labor efficiency.

on the factors of production. When the smallest flocks were analyzed from this point of view there was a great variation in the profit obtained per breeding ewe and also in total profits per ranch. The 6 smallest flocks with no factors above average showed an average profit per ewe of 40 cents and the total profit per flock was $325 (table 51). The 6 ranches with 5 factors above average had an average profit per ewe of $3.84 and a profit per flock of $1,700. Although there were almost twice as many breeding ewes in the first flock the total profit for this second group of ranches was over 5 times as great as the profit from the larger less efficiently operated flocks.

The larger ranches were analyzed in the same manner, and essentially the same relationship between efficiency in production and profits was found to exist as was shown for the smaller ranches (table 52). The profits per ewe ranged from $1.09 for those ranches with no factors above average to $3.73 for ranches with all factors above average. These relationships indicate quite clearly that the chances for profits are greatly enhanced if the various factors can be maintained at average or better.

Table 52. *Relation number of factors above average to profit per ranch and per ewe in largest flocks* 1939-1941

Number factors above average	Records	Ewes per ranch	Profit per ewe	Profit per ranch
	number	*number*	*dollars*	*dollars*
0	5	2,018	1.09	2209
1	13	2,377	1.64	3898
2	13	2,006	2.08	4178
3	23	1,897	2.15	4071
4	14	1,697	2.87	4865
5	10	1,682	2.85	5788
6	2	1,424	3.73	5318
Average	80	1,931	2.28	4398

Factors are: Fall lamb crop, lamb weight, fleece weight, death loss stock sheep, death loss lambs, and labor efficiency.

COMPARISON OF FACTORS FOR LEAST AND MOST PROFITABLE RANCHES

By way of summarizing the factors that are associated with profitable production of stock sheep, the enterprise records were divided into three groups on the basis of profit per ewe. The results are shown in table 53. The differences in various individual factors between the groups of ranches should not be interpreted as being necessarily responsible for the differences in the profits obtained from the enterprise. The profitable ranch is one that is well balanced in organization and is efficient in all the factors that influence profits.

The comparison of average for least and most profitable ranches show that the ranches with highest profit per ewe (1) produced more lambs and wool per head of sheep; (2) sold lambs and wool for more money per pound; (3) were more efficient in use of labor; (4) had a lower percentage loss of stock sheep and lambs; (5) cared for sheep on public ranges a smaller proportion of the time; and (6) were operating at a lower cost per breeding ewe.

Table 53. *Comparison of factors that affect profits per ewe for least and most profitable ranches** 1939-1941

Items	Unit	Average for ranches with			Average of all ranches
		Least profits	Average profits	Most profits	
Profit per ewe	dollars	1.38	2.41	3.68	2.38
Profit per ranch	dollars	1,717	3,311	3,220	2,764
Number breeding ewes	number	1,241	1,375	875	1,161
Lamb crop	percent	70	76	87	76
Lamb weight	pounds	67	67	74	69
Fleece weight	pounds	9.5	9.5	10.1	9.7
Pounds of lamb produced per breeding ewe	pounds	46.7	50.3	63.8	52.5
Lamb receipts per ewe	dollars	3.84	4.26	5.45	4.46
Wool price per pound	cents	28.8	29.2	30.0	29.3
Death loss stock sheep	percent	10.5	8.9	7.0	9.0
Death loss lambs	percent	7.4	7.0	4.5	6.4
Sheep cared for per man	number	704	755	781	745
Proportion time on public ranges	percent	61	61	46	58
Total receipts per ewe	dollars	7.19	7.77	9.17	7.93
Total expenses per ewe	dollars	5.81	5.36	5.49	5.55

* Profitableness was based on the profit per breeding ewe in the flock.

It should be recognized that the total income available to the ranch family is more important than the profit per unit of production and the largest ranch incomes were not associated with highest profit per ewe. On many ranches, the total earnings could be increased more economically by increasing the efficiency of the business than by increasing the size of the stock sheep enterprise.

COSTS AND RETURNS FOR THE SHEEP ENTERPRISE IN 1945

SINCE 1941 great changes have occurred in the price of many of the items that enter into the cost of and returns from the production of lambs and wool. And as a result of the changes in price relationships there probably have been some adjustments in ranch practices. During this period rates of production and death losses of sheep and lambs have also changed. Changes in practices and rates of production,

however, are minor in their influence on expenses, receipts, and profits when compared with the influence of the change in prices.

Table 54. *Expenses, receipts, and profits per breeding ewe southwestern Utah,* 1939-1941, *and* 1945

Item	Expense per ewe		Percent of total expenses	
	1939-1941	1945	1939-1941	1945
	dollars	*dollars*	*percent*	*percent*
Expenses of production				
Labor*	1.24	2.96	22.3	27.7
Camp supplies	.38	.72	6.8	6.7
Interest @ 5% on investment	1.18	1.66	21.3	15.5
Herd depreciation	.57	1.61	10.3	15.1
Feed	.63	1.29	11.3	12.1
Equipment and improvements	.53	.95	9.5	8.9
Shearing and supplies	.27	.46	4.9	4.3
Taxes	.27	.32	4.9	2.9
Leases	.18	.27	3.3	2.5
Grazing fees	.10	.11	1.8	1.0
Miscellaneous	.20	.35	3.6	3.3
Total expenses*	5.55	10.70	100.0	100.0
Receipts				
Sale of lambs†	3.39	4.75	61.1	44.4
Replacement lambs†	1.07	1.50	19.3	14.0
Wool‡	3.32	3.84	59.8	35.9
Miscellaneous	.15	.22	2.7	2.0
Total receipts	7.93	10.31	142.9	96.4
Profit*	2.38		42.9	
Loss*		.39		3.6

* Wages for the operator include no additional allowance for management, but represent wages at the same rate as those paid hired labor. Any allowance for management would increase the expenses and decrease the profits from those shown in the table.

† Lamb receipts in 1945 are based on an average lamb crop of 72.5 percent and an average weight per lamb of 69 pounds. The lamb crop for the years 1939-1941 was 76.5 percent and lambs weighed 69 pounds at market time.

‡ The average fleece weight in 1945 was 9.0 pounds as compared with an average of 9.7 for the three year period.

An estimate of expenses, receipts, and profits from the sheep enterprise for the year 1945 has been prepared and is presented in table 54 with comparable data for the prewar years. The estimates are based on the data presented in this bulletin, and on general price and production data currently available. Current data on lamb crops, fleece weights, death losses, lamb and wool prices, and changes in expenses were obtained from a local finance corporation for 17 of the ranches included in the 1939-41 study. The data used in the calculation of the 1945 expenses and receipts were verified in meetings held with sheep operators of southwestern Utah.

The cost of labor increased more than any other single item of expense. The average wage rate in 1939-41 was $65 per month exclusive of board, as compared to $155 per month for 1945. Labor costs per ewe for 1945 were $2.96 as compared to prewar cost of $1.24. This was an increase of $1.72 or 138 percent. During the prewar period, labor costs represented 22 percent of the total cost while in 1945 they were 28 percent. The decline in the efficiency and training of labor, another element in the increased cost, is not reflected in a comparison of these dollar and cents figures. Even with less efficient labor, the above expenses are based on the same labor requirement per head for each period.

Expenses for camp supplies increased from $19.85 to $37.50 for each month of hired labor. This meant an increase per ewe of 34 cents and change from 38 cents per ewe in 1939-41 to 72 cents for 1945. Camp supplies are essentially additional expenses for labor and when added to wages make total labor expenses equal to $3.68 per ewe in 1945 as compared with $1.62 in the period 1939 to 1941, inclusive. These figures include wages for the operator at average ranch wage rates but do not make any allowance for higher wages customarily given for management.

Expenses for interest on the operator's investment, while increasing from $1.18 to $1.66 per breeding ewe, were proportionately lower in 1945 than in the earlier period. In the prewar years, interest on investment represented 21.3 percent of all expenses but even though increasing 40 cents per ewe, was only 15.5 percent in 1945. In other words, the operator's ranch property did not raise in value nearly so rapidly as his expenses of operation.

The expense per breeding ewe for herd depreciation in 1939-41 was 57 cents as compared to $1.61 in 1945. This increase is a result of a combination of circumstances: (1) In the latter year death losses were higher. (2) While the value of the breeding ewes was materially higher in 1945 than prewar, the sale value of the cull ewes did not increase proportionately; thus the depreciation rate of breeding stock was increased. (3) The difference in value of ewe lambs held by the stockmen for replacement purposes and the value of the breeding ewes were considerably narrowed in 1945 and as a result any offsetting increase in value of ewe lambs held for replacement purposes was materially reduced in 1945 as compared with the earlier years.

Expenses per ewe for hay, grain, and concentrates were more than twice as high in 1945 as in prewar years. This was entirely a result of changes in feed prices, for amount of feeding was assumed to have remained constant. Grain and concentrate prices in Utah increased about 105 percent and hay prices increased almost 115 percent during

this period of time. The feed fed includes feed for horses as well as that fed to the stock sheep.

Expenses for taxes, leases, and grazing fees increased less than the other items. Taxes increased, however, as a result of increased appraisal of livestock and land and additional assessments on livestock for bounty purposes. The increased expenses for leases reflects higher market values of range and farm lands and also competition for use of lands by cattle producers who have been in a relatively more favorable economic position. Grazing fees were practically the same in both periods of time. The slight increase is a result of slightly higher fees for grazing on Forest Service lands which are adjusted to livestock values. Grazing Service fees have been the same throughout the entire period. These items of expense that did not materially increase were the least important ones; in 1939-41 taxes, leases, and grazing fees made up only 10 percent of all costs, and in 1945 represented only 6.4 percent of the total.

The receipts per breeding ewe increased from $7.93 in 1939-41 to $10.31 in 1945. This was a result of an increase in prices paid for lambs and wool. The number of lambs raised per 100 ewes and the average fleece weight were lower in 1945 than during the years immediately preceding the war. Death loss of stock sheep and lambs was higher. The lamb crop at market time in 1945 was 72.5 percent of ewes on hand at breeding time compared with 76.5 percent for 1939 to 1941. Average fleece weights in 1945 were lower by 7/10 of a pound. The average market weight of the lambs was assumed to have remained constant at 69 pounds. Higher death loss of stock sheep and lambs reduced the pounds of lamb produced per breeding ewe on the ranch. Inferior labor was undoubtedly an important factor in reducing the efficiency of operations in 1945.

Average value of lambs produced in 1945 was $6.25 per ewe as compared with $4.46 per ewe in 1939-41. This value is based on average sale price, including some subsidies, in 1945 of $12.50 per hundredweight of lambs as compared with $8.48 in the earlier period. However, most lambs produced in this area are sold as feeders and therefore were not covered directly by the subsidy program. Assuming the same proportion of all lambs sold during each period, the 1945 value of lambs sold would be $4.75 per ewe and the value of lamb replacements $1.50 as compared with sales of $3.39 and a replacement value of $1.07 per ewe for the years 1939-41. Wool sales increased from $3.32 per ewe to $3.84 in 1945. The price per pound of wool sold was 29.3 cents in prewar years, and averaged about 35 cents in 1945.

During the period 1939 to 1941 the average total receipts per breeding ewe were $7.93 as compared with $10.31 in 1945 or an increase of $2.38. During the same period the expenses of operation increased from $5.55 to $10.70, an increase of $5.15 per ewe. In 1939-41 the profit or return to the operator for his management and assuming the risks involved in production was $2.38 per ewe or 42.9 cents on each dollar of expenses; whereas, in 1945 there was a loss of 39 cents per ewe or 3.6 cents for each dollar of expenses.

The elimination of profits and the uncertainty of the future has been responsible for the marked reduction in the number of stock sheep in southwestern Utah as well as the rest of the state. Since the 1939-41 study was made, the number of stock sheep in Utah has declined 438,000 head or 17.7 percent. The 1945 preliminary census reports show that all sheep numbers in southwestern Utah have declined 26.4 percent in the same period of time.

The trend of expenses was closely associated with changes in the general price level of the country. In the immediate postwar period, if the general price level remains stable, expenses are not expected to decline; if the price level rises, expenses are likely to move upward. Current increases in industrial wage rates will likely forestall any decrease in ranch wages, although it may be somewhat easier to obtain hired men at the going wage rates. Since there is relatively little opportunity of appreciably changing the rates of production of the stock sheep enterprise, receipts and profits will be determined largely by government price policy.

SUMMARY

RANCH records from 71 different ranches were used in this analysis with an average of 60 for the years 1939, 1940, and 1941.

Production of range sheep in southwestern Utah is closely associated with use of public ranges. Most of the area of southwestern Utah receives less than 12 inches annual precipitation so that irrigation is necessary for successful crop production. Water for irrigation purposes is relatively limited.

Of the total land area of 5,320,000 acres, 73 percent was controlled by federal agencies in 1940. Less than 20 percent of the area was privately owned.

Of the estimated 676,435 animal unit months of grazing on range lands in southwestern Utah in 1940, only 207,133 come from privately owned range lands. The Grazing Service issued permits for 381,124 and the Forest Service for 88,178 A.U.M.'s of grazing. About two-thirds of all grazing in this area was by sheep.

In 1939, the total cropland harvested was 45,890 acres, of which 88.6 percent was used for the production of hay and grain crops.

The total patented land resources per sheep ranch were 3,551 acres, of which 1,224 acres were leased. Of the patented land included in the ranch, crops were harvested from 53 acres and approximately 3,400 acres were used for grazing purposes. In addition to the patented land, most operators had permits to graze on Grazing Service lands and some had permits for grazing on forest lands.

The total capital invested per ranch for the years 1939 to 1941 was $41,608. Of this 66 percent consisted of real estate, 25.2 percent sheep, 3.8 percent other livestock, and 5 percent was in equipment, feed, and supplies. The operator's equity in the ranch was $27,975 or 67.2 percent of the total. The average indebtedness was $9,119 per ranch but decreased almost $1,000 during the three year period. The value of the leased properties was $4,524 per ranch.

Total annual ranch receipts, 1939 to 1941, were $9,524 per ranch of which 90 percent came from sheep and wool, 4 percent from cattle, 2 percent from crop sales, and 4 percent from all other sources. Average receipts per ranch increased from $7,486 in 1939 to $12,165 in 1941. Increase in receipts was a result of higher prices and higher rates of production.

The total annual ranch expenses were $4,612, but they increased from $4,218 per ranch in 1939 to $5,183 in 1941. The increase in expenses was small compared with the increase in receipts.

The average 1939-41 labor and management income was $2,832 per ranch. During the three year period this income increased from $1,226 in 1939 to $4,810 in 1941. The rate of return on capital investment was 6.7 percent in 1939 and 14.6 percent in 1941. The average rate of return for the three year period was 10.4 percent.

Detailed analysis of this study was restricted quite generally to the stock sheep enterprise rather than the entire ranch business. This enterprise excludes the fattening of lambs in the feed lot. The summary of the enterprise analysis is as follows:

Fine wool sheep predominate in this area. However, there is a trend toward the use of more cross-bred ewes. It was a general practice for ranchers to raise their own ewe lambs for herd replacement and purchase their rams.

Lambing took place on the open range for most flocks. Shed lambing or lambing in fields was customary only with smaller flocks.

All flocks were shorn with machines. In recent years portable shearing corrals and pens have been taken to the range where shearing takes place rather than to trail the sheep to centrally located shearing plants.

The size of flocks included in this study varied from 100 to 5,000 per ranch. The average number was 1,429 of which 1,169 were breeding ewes. The most typical size of the operating unit was from 750 to 1,500 head of breeding ewes.

The average value of the operator's investment in the sheep enterprise was $27,468. This includes the value of all assets used exclusively by the stock sheep; but excludes the value of cropland. Harvested feeds were charged to the sheep at market prices. The total investment amounted to $19.22 per head of stock sheep and to $23.65 for each breeding ewe. Of the total enterprise investment, 35.8 percent was in sheep, 49.1 percent in land and improvements, 11.1 percent in range privileges, and 4 percent in horses and equipment.

An average of 3,305 acres of patented range land was used by the sheep enterprise of which 2,090 acres were owned and 1,215 acres were leased. Half of the private range land was used for summer grazing. Owned grazing lands had a higher per acre value than leased lands.

Permits to graze on public ranges for the average enterprise were the equivalent of 825 head of sheep for one year, or 825 sheep units. Of this total, 727 sheep units were issued by the Grazing Service to the operator, and an average of 30 sheep units of grazing on Grazing Service lands were leased from other sheep operators; and 68 sheep units were permits to graze on the national forest lands. These permits were sufficient to care for 60 percent of the sheep of the enterprise.

The average enterprise receipts for the three year period were $9,210 of which 42 percent came from wool and pelts, 43 percent from lamb sales, 2 percent from miscellaneous sources, and the value of lambs held for flock replacements made up the other 13 percent. Average receipts per breeding ewe increased from $6.05 in 1939 to $9.91 per head in 1941. The increase was a result of an 11 cent per pound increase in wool prices, a 2.2 cent per pound increase in lamb prices; and also from increased production of lambs and wool.

The average expense per breeding ewe was $5.55 of which $1.62 was labor and camp supplies, $1.45 for interest and taxes, 57 cents for herd depreciation, 53 cents for equipment and improvements, 50 cents for feed to supplement range forage, 27 cents for shearing, and 61 cents for all other expenses.

The difference between the receipts and expenses, or the profit, averaged $2,764 per ranch or $2.38 per breeding ewe. In 1939 profits were $1.08 per ewe but in 1941 they were $3.85. In all years of the study some ranches failed to make a profit.

Analysis of the enterprise to show the relationship of important production factors and organization to returns indicate:

(1) There was little association between the size of flock and the profit per ewe, but total profit per ranch was closely associated with the size of the enterprise. The higher unit production of small flocks was partially offset by higher labor efficiency and lower unit costs of operation for larger flocks. The dependency of the enterprises on public ranges increased as the size of the flocks increased.

(2) The lamb crop was one of the factors most closely associated with profit per ewe. Largest lamb crops tended to be associated with flocks spending the most time on private lands; and low lamb crops with the most time on public lands. This was particularly noted among the smaller flocks.

(3) The value of the fleece was positively associated with the profit per breeding ewe. Sales of wool through producers' cooperatives brought more money per pound than sales through other agencies.

(4) The profits per ewe tended to increase as the death loss of stock sheep decreased. Expenses for herd depreciation were 82 cents per ewe for the flocks with high death losses in stock sheep, averaging 12.6 percent, and average profit per ewe was $1.99. Flocks with least losses, averaging 5.1 percent, had a herd depreciation expense of 32 cents and a profit of $2.78 per ewe.

(5) Death loss of lambs was also associated with profits per ewe. Flocks with 2.5 percent loss of lambs between docking and market time had a profit of $2.77 per ewe; profit was $2.15 per ewe for the flocks with an average loss of 10.9 percent. High death loss of lambs was associated with high proportion of time on public ranges. The flocks in the group of ranches with losses of 10.9 percent were on public ranges 60 percent of the time, flocks with an average loss of 2.5 percent were on public lands only 37 percent of the time.

(6) There was apparently little association between the amount of supplemental feeding of larger range flocks and profits from the enterprise. Most of the feeding was done by operators of smaller flocks.

(7) The groups of ranches with the greatest and also the least proportion of the total investment in land, averaging 57.4 and 15.9 percent, respectively, made less profit per ewe than ranches with an average investment in land of 46.7 percent.

(8) The profit per ewe and also total profits of the enterprise tend to increase consistently as the number of the previously mentioned factors, which are associated with profits, are found to be more favorable than average.

On many ranches the total earnings could be increased more economically by increasing the efficiency and productivity of the business than by increasing the size of the stock sheep enterprise.

Increase in prices of the items that enter into the cost of and returns from production of lambs and wool, since 1939-41, has resulted in marked changes in expenses, receipts, and profits from the sheep enterprise.

Expenses of operation increased from $5.55 per breeding ewe for the period 1939-41 to $10.70 for the year 1945.

The added cost of labor and camp supplies amounted to $2.06 per ewe of the $5.15 increase in expenses from the prewar years.

Receipts per breeding ewe increased from $7.93 in 1939-41 to $10.31 in 1945. The $2.38 increase in receipts was only 46 percent of the increase in expenses.

Lower rates of production of lambs and wool, and higher death losses in 1945 contributed to the relatively smaller increase in receipts as compared to expenses.

The return to the operator for his management and assuming the economic risks involved in this enterprise was $2.38 per ewe in 1939-41; but in 1945 there was a loss of 39 cents.