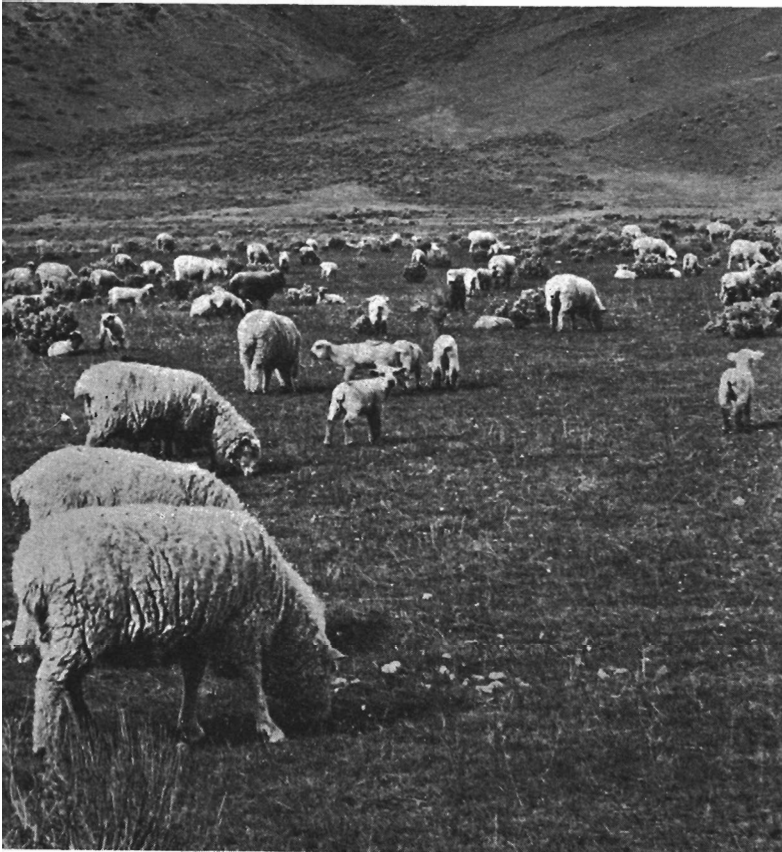


Farm Organization and Financial Returns

IN THE LOWER POWDER RIVER VALLEY
BAKER COUNTY, OREGON.



Oregon State System of Higher Education
Oregon State College
Corvallis
Agricultural Experiment Station
In Cooperation with
Soil Conservation Service
and
Bureau of Agricultural Economics
United States Department of Agriculture

FOREWORD

Financial returns in farming are dependent upon two sets of factors: (1) those within the control of the individual farmer, and (2) those outside of his control.

This publication, dealing with the first group of factors, presents the results of a careful economic analysis of the agriculture of the Lower Powder River Valley in Baker County. Special consideration has been given to the following types of farming: beef cattle, range sheep, dairy, general livestock, and crops.

It is hoped that the results of this study will be helpful, (1) to individual ranchers and farmers, in this valley and in similar areas of eastern Oregon, in pointing out those factors that were chiefly responsible for variations in farm income; and (2) to State and Federal agencies in the administration of programs designed to improve farm income and at the same time conserve soil and water resources.

WM. A. SCHOENFELD
Director

TABLE OF CONTENTS

	Page
Summary	4
Introduction	7
Description of Area.....	8
The Keating Area	
Farm Organization	12
Distribution of Farm Investment.....	24
Financial Summary	25
Representativeness of Data	27
Some Reasons for Variations in Income.....	28
Present Economic Status.....	41
Conclusions	46
The Sparta Area	
Farm Organization	48
Distribution of Investment.....	49
Financial Summary	50
Representativeness of Data	51
Present Economic Status	51
Conclusions	52
Appendix	
Explanation of Terms.....	53
Supplementary Tables	54

SUMMARY

This study deals with the organization and financial returns of 61 irrigated farms and ranches in the Keating Area and 19 dry-land farms in the Sparta Area of Baker County, Oregon. The information presented in this publication was obtained by the survey method and represents the fiscal year, June 1, 1938 to May 31, 1939.

THE KEATING AREA

TYPE OF FARMING AND LAND USE.

The 61 farms in the Keating Area have been classed into 5 types of farming groups as follows: 16 beef cattle ranches, 6 sheep ranches, 14 dairy farms, 17 general livestock farms, and 8 crop farms.

SUMMARY OF SIZE AND FINANCIAL RETURNS PER FARM BY TYPE OF FARMING
Keating Area, Baker County, Oregon, 1939

Type of farming	Acres in crop	Animal units live-stock	Total farm invest-ment	Labor income	Return on invest-ment	Capital accumu-lation per year
	<i>Acres</i>				<i>Per cent</i>	
Beef cattle	263	219	\$46,478	\$1,218	4.5	\$721
Sheep	442	517	91,127	2,635	5.4	868
Dairy	79	39	11,082	430	1.8	426
General livestock ..	72	30	10,413	235	-0.1	350
Crop	94	19	11,264	679	4.7	201
ALL FARMS	163	128	\$28,077	\$ 332	4.1	\$561

Range land, excluding publicly owned land, comprises 88 per cent of the total acres operated. The farms and ranches average 1,854 acres per farm, of which 163 acres are in crop and 1,634 are privately owned range land. About 74 per cent of the average crop acres are devoted to hay, 20 per cent to grain and 6 per cent to miscellaneous crops. During the crop year 1938, the yields were approximately 15 per cent lower than those reported as "usual."

LIVESTOCK AND LIVESTOCK PRACTICES.

Beef cattle and range sheep account for 75 per cent of the animal units, dairy cattle account for 10 per cent, workstock 8 per cent, and the remainder is hogs, poultry, and farm sheep. Dairy stock is the most important class of livestock on most of the farms.

Beef cattle and range sheep are grazed on private range land, the public domain, and the national forest. During the winter months they are fed about a ton and a half of hay per animal unit on the home ranch. The feeding period usually lasts from December through March. During the year of the study, beef cattle operators received a calf crop of 72 per cent and sheep operators had lamb crops averaging 113 per cent. The

dairy cattle had a butterfat production of 204 pounds per cow, which is about 32 pounds lower than the state average for approximately the same period.

INVESTMENT.

The average farm investment for all 61 farms is \$28,077. In terms of total investment, sheep ranches are almost twice larger than cattle ranches and in turn cattle ranches are four times larger than the other three types of farms. Land represents the largest single investment. It varies from 54 per cent of the total investment on cattle ranches to 70 per cent on crop farms. Livestock represents 30 per cent of the investment on sheep ranches and only 8 per cent on crop farms.

FINANCIAL RETURNS.

Range livestock ranches were more successful than the other types of farming. Of course they were also much larger. The operators earned 4 per cent on their investment in addition to an income for their labor and management of \$832. The latter figure is about \$25 more than the operators considered their own time to be worth. The operators also had a house to live in and the use of farm produced food. These items valued at wholesale prices amounted to \$450 per farm.

The average gain in net worth per year was \$561 for the 13 years that the operators had been on their present farms. Sheep ranches had the highest capital accumulation per year, but in relation to their original net worth they had accumulated relatively less than the other types of farming.

REASONS FOR VARIATION IN INCOME.

The average income received by all operators can be considered satisfactory. The incomes on individual farms and groups of farms, however, vary considerably. In general the factors that were most important in explaining differences in labor income between individual farms, without regard to type of farming, were the two factors, productive man work units per farm (size of farm) and productive man work units per man (labor efficiency). With respect to individual types of farming, the following factors were chiefly responsible for variations in labor income: size of farm on beef cattle ranches, dairy farms, and crop farms; labor efficiency on beef cattle ranches, and general livestock farms; feeding rates on beef cattle ranches and dairy farms; and crop yields on general livestock farms.

LONG-TERM AND SHORT-TERM INDEBTEDNESS.

The total farm investment consists of the operator's equity, \$16,984; farm liabilities of the operator, \$7,372, and the value of rented property, \$3,721.

Real estate mortgage indebtedness on mortgaged farms averaged \$7,391 per farm, or expressed in another way, amounted to 36.8 per cent of the value of real estate. Short-term credit averaged \$2,217 per loan.

THE SPARTA AREA

This Area is located in the eastern portion of the Lower Powder River Watershed and at an elevation several hundred feet above the valley floor and the Keating Area.

LAND USE.

The 19 farms average 477 acres per farm of which about 72 are in crop, and 381 are grazing land. About 50 per cent of the acreage in crops is devoted to hay, 37 per cent to grain, and 13 per cent to miscellaneous crops. During the year of the study, crop yields were about 91 per cent of "usual."

LIVESTOCK.

Livestock per farm average 20 animal units. Of this number, 34 per cent were dairy cattle, 33 per cent were workstock, 13 per cent were beef cattle and the remainder were miscellaneous livestock. Only one farm had beef cattle and none had range sheep.

INVESTMENT.

The average farm investment was \$5,741. Of this amount, 57 per cent represents the value of land and 18 per cent is the value of livestock.

FINANCIAL RETURNS.

Total farm receipts amounted to \$1,077 per farm and were derived chiefly from the sale of livestock, livestock products, and crops.

The net financial returns were low. After being allowed 4 per cent on their total farm investment, the operators failed to receive a wage for their labor and management. They had a house to live in, however, and the use of farm produced food. These items valued at wholesale prices amounted to \$302 per farm.

CONCLUSIONS.

With possibly one or two exceptions, all farms in the Sparta Area are quite small. Seventy-two acres of dry-farmed land with the kinds of crops grown and the yields received, even when combined with about 13 animal units of productive livestock cannot be expected to return a very large income. The farms are so small that on the average each man has only enough work to keep him busy about 122 days per year.

Farm Organization and Financial Returns in the Lower Powder River Valley, Baker County, Oregon*

By

GEORGE B. DAVIS, Research Assistant,

and

D. CURTIS MUMFORD, Head, Department
of Farm Management

INTRODUCTION

THIS economic study of farm and ranch organization in the Lower Powder River Valley of Baker County, Oregon, was made at the request of the Baker County Land Use Planning Committee. It represents one phase of the coordinated land use survey being made of this particular area.†

OBJECTIVES

The objectives of this study of the economic aspects of ranch and farm organization in the Lower Powder River Valley were:

1. To describe the present land use in its relation to farm and ranch organization.
2. To determine financial returns by individual farms and by type of farming groups.
3. To analyze the factors responsible for variations in income.
4. To assemble economic information to facilitate planning a land use and soil conservation program.

* *Acknowledgments:* The authors thank the eighty farmers and ranchers for their time and effort in making the basic data available. Acknowledgments are also made to H. L. Thomas and Wesley R. Spencer of the Soil Conservation Service for consultation and advice in planning this study; Bernard M. Otness and Virgil D. Kennedy of the Soil Conservation Service for their assistance in obtaining the detailed farm organization records; Joe L. Barber of the Grazing Service, United States Department of Interior, for aid in analyzing the records; Norma MacDonald and Audrey Schneider for assistance in tabulating and summarizing the data; Professor E. L. Potter, head of the Division of Agricultural Economics, Oregon State College, for his valuable aid in the preparation of the text; and P. T. Fortner, County Agricultural Agent of Baker County, for his advice and help in making contacts with the cooperators. The authors are indebted to the Soil Conservation Service for the cover page picture and to the Agricultural Adjustment Administration for the pictures used in Figures 6, 8, and 10.

† The other phases of the "overall" study consist of the following surveys: conservation, range, woodland, engineering, agronomic, and wildlife.

At the present time the field work is under way or has been completed for most of these surveys. It is anticipated that the final results of the individual studies will be combined into an "overall" report, which will serve as a basis for making adjustments in land use.

The following organizations are cooperating in making these surveys: The Agricultural Adjustment Administration, the Bureau of Agricultural Economics, the Bureau of Chemistry and Soils, the Bureau of Entomology and Plant Quarantine, the Forest Service, the Farm Security Administration, and the Soil Conservation Service of the United States Department of Agriculture; the Fish and Wildlife Service and the Grazing Service of the Department of the Interior, and Oregon State College.

SOURCE OF DATA

The field data were obtained from 80 farm operators in Lower Powder River Valley by means of the survey method. The data were collected in the summer of 1939 and represent the period June 1, 1938 to May 31, 1939. Of the total records completed, 61 were secured from operators in the Keating Area and 19 from operators in the Sparta Area. The 80 records represent about 80 per cent of the approximately 100 farm operators in the Lower Powder River Valley. The remaining 20 operators were contacted, but complete records were not obtained.

METHOD AND PROCEDURE

In analyzing the information obtained in the field, it has been assumed for comparative purposes that all operators are free of debt, that all rented land is owned, and all taxes are paid. As a result, interest and principal payments on mortgages and rent payments have not been considered as expenses. Taxes on rented land, however, are considered as expenses of the farm operator. This procedure places each farm and ranch on a fairly comparable basis.

After the information had been completely summarized, some of the more general results were released in the form of a mimeographed statistical summary to the Baker County Land Use Planning Committee and to the 80 individual farmers and ranchers cooperating in the study. In addition to the summary of the entire study, each cooperator received the results of his year's farm business. Late in the summer of 1941 a progress report presenting some of the results of the study was released in Oregon Station Circular 250.

DESCRIPTION OF THE AREA

LOCATION

The area in which this study was made is located in the Blue Mountain region in those portions of Baker and Union Counties that form the Lower Powder River watershed (Figure 1). The part lying in Union County includes no farming land and is in the Whitman National Forest. The area studied can be divided into two distinct farming districts: the Keating Area and the Sparta Area.

The Keating Area is, for the most part, located on the valley floor of Powder River and extends from the Powder River Canyon on the east to Union County on the northwest, a distance of approximately 15 miles. The farming land is largely irrigated and is used chiefly for hay production and as headquarters for the surrounding range areas. The Sparta Area on the other hand is a dry-farming region located east of the Keating Area and at a much higher altitude.

TOPOGRAPHY

The southern part of the area consists of rolling sagebrush hills with occasional buttes rising to 4,000 feet above sea level. The northern part is rugged and mountainous with some elevations more than 9,000 feet above sea level.

The valley floor of the Powder River is relatively flat and ranges in elevation from 2,600 to 2,800 feet. The main valley varies in width from 1 to about 3 miles. The valleys formed by the tributary streams are much narrower, but are sufficiently flat to permit farming.

The farm land in the Sparta Area consists of rolling hills varying in elevation from 4,000 to 4,300 feet. The farming land is widely scattered because of steep slopes, timbered areas, and rock outcrops.

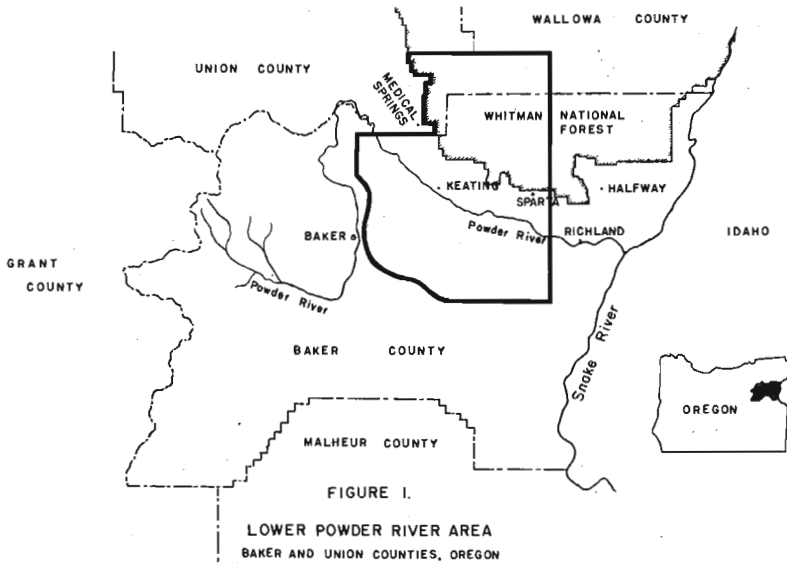


Figure 1. Lower Powder River Area, Baker and Union Counties, Oregon.

SOILS

The valley soils of the Keating Area are of alluvial origin and vary in texture from sandy loams to clay loams. Considerable alkali is present in these soils and unless better drainage facilities are made available a serious alkali problem may arise.

The soils on the cultivated but nonirrigated hill or bench land adjacent to the main valley are also alluvial but the slopes are steeper, and in general, the soils are lighter in texture.

The soils of the Sparta Area are for the most part shallow residual soils decomposed from the underlying volcanic rock. In many places the rock outcrops tend to limit the cultivated areas to relatively small tracts. Good drainage and the absence of irrigation limit any alkali accumulations.

CLIMATE

No climatic data are available for the specific area in which this study was made, but information from the United States Weather Bureau at Baker, approximately 15 miles southeast of the Lower Powder River Valley, should be representative of the area under consideration.

The region is semiarid with total annual precipitation averaging approximately 13 inches. Over a 48-year period, 33 per cent of the precipitation occurred during winter months, 28 per cent during spring, 18 per cent during

summer, and 21 per cent during fall months. Most of the winter precipitation is in the form of snow.

The region is subject to considerable extremes in temperature with a long-time average difference of 41° F. between the coldest and warmest months. The mean annual temperature (48-year average) is 45.3 degrees.

Summers are characterized by many cloudless, sunny days with relatively high temperatures all of which are conducive to quick maturity of crops. Relatively late spring frosts limit the choice of crops. In 1938 the latest killing frost occurred May 17, and the earliest, October 13.

ECONOMIC DEVELOPMENT OF THE AREA

Historical background. The early agricultural development of the area is closely associated with gold mining. Rich gold strikes were made in the Sparta Area in 1863 and soon Sparta, or Kooster as it was known then, became a typical western gold-rush town.

Food supplies for the miners were transported from Umatilla Landing on the Columbia River by pack-train, so it was natural that local agriculture should be developed to supply this market. By 1868 agriculture had become firmly established with considerable irrigation. The cattle and sheep industries had also started.

By 1890 many of the mines had closed down but the construction of the Union Pacific Railway opened up many new and permanent markets for the agricultural products.

During the early development of the area irrigation water was plentiful, but as more land came under cultivation, the water supply of Powder River and its tributaries was all utilized and private reservoirs and canals were built. The Thief Valley storage dam was constructed on the Powder River by the United States Bureau of Reclamation in 1932. The reservoir has a capacity of 17,400 acre feet. This reservoir now supplies irrigation water to the greater portion of the cultivated land in the Valley.

Principal towns and communities. There are no incorporated towns located within the area but there are trading centers with post offices at Sparta, Keating, and at Medical Springs.

Baker is the chief shipping point and shopping center for the area. It is a city of slightly less than 9,000 population and is located 15 miles from Keating, 35 from Sparta, and 20 from Medical Springs.

Transportation. The area is served by Oregon State Highway 86, which begins at Baker, skirts the edge of the Keating Area, and then runs east to Halfway. Several good county roads branch off from the highway and serve the Valley farmers.

The county road branching off Highway 86 to the Sparta Area occasionally becomes impassable during the winter months due to heavy snowfall, leaving the community virtually isolated.

The Union Pacific Railroad has one main line and one branch line serving the area. The main line operates through Baker. Here many of the cattle and sheep from the area are shipped to Pacific Coast and midwest markets. The branch line of the Union Pacific operates from Huntington in southern Baker County to Robinette on the Snake River near the mouth of Powder River. Some of the operators find it closer to bring their livestock from summer and fall range to this shipping point than to Baker.

The agriculture. The agriculture of the Keating Area is essentially based on livestock with beef cattle and range sheep predominating. Dairy cattle, hogs, and farm sheep, however, are common on most farms. The range livestock enterprises are dependent upon winter feed produced on irrigated farmland and upon spring, summer, and fall grazing on private and publicly owned range land and the national forest. (Figure 2.) The cropland is almost entirely devoted to hay, grain, and pasture to be consumed by local livestock.



Figure 2. Grazing land along the north side of the Lower Powder River Valley. Almost 90 per cent of the privately owned land is used for grazing.

The agriculture of the Sparta Area is chiefly dry-farming. Dairy cattle are the most common kind of livestock while range livestock are of little importance.

The Keating and the Sparta farming areas are distinctly different, not only in topography, soils, kinds of livestock, and cropping systems, but also from the standpoint of size of farms and types of farming. For these reasons the analysis is presented in two sections. The first section is devoted to the Keating Area.

The Keating Area

FARM ORGANIZATION

In order to discover and understand the problems of an agricultural area, it is essential to have a basic knowledge of the types of farming, size of farms, the land use, crops grown, and the livestock raised in the particular area.

TYPES OF FARMING

Types of farming are usually associated with a long-time program, which the farmers have found to be best suited to the area and to any peculiarities of their own farms. The largest portion of the cropland in the Keating Area is devoted to alfalfa hay and small grains, but the disposal of these crops differs a great deal between farms. Some farmers raise these crops for direct sale, others feed their crops to one class of livestock, while still others feed several classes of livestock.

Farms were classified according to the major source of income. Five classes or types were found.

<i>Type of farming</i>	<i>Number of farms</i>
Beef cattle	16
Range sheep	6
Dairy	14
General livestock	17
Crop	8
TOTAL	61

Table 1. RANGES IN SIZE OF FARMS AND AVERAGE SIZE OF FARM BY DIFFERENT MEASURES OF SIZE
Keating Area, Baker County, Oregon, 1939

Measure	Number of farms	Range		Average
		Low	High	
Total productive man work units*.....	61	100	4,200	576.5
Man equivalent*	61	1	16	2.4
Acres in crop.....	61	2	1,250	162.8
Total investment*	61	\$1,000	\$230,000	\$28,077.0
Total animal units*.....	61	6	1,200	128.5

* See page 53, Appendix, for explanation of terms.

SIZE OF FARMS

The size of the farming unit may be measured in several ways. Table 1 shows the size of the farms in the area and the range between the smallest and the largest as measured by total productive man work units, man equivalent, acres in crop, total investment, and animal units.

LAND USE

The proportion of the total acres in each class of land will vary a great deal on the individual farm, depending upon the type of farming, size of the farming unit, efficiency of operation, and the financial ability of the operator to make the adjustments he feels are necessary to achieve the correct combination of land classes.

Range land, even excluding public domain, is by far the largest single class of land, comprising 88 per cent of the total acres operated (Table 37, Ap-

pendix). Cropland is next in importance, accounting for 11 per cent of the total acres. Of the total cropland, 84 per cent is devoted to crops, 4 per cent is idle or fallow, and the remaining 12 per cent is cropland pasture.

Eight hundred seven acres, or 7 per cent of the cropland, is without any form of irrigation while the remaining 93 per cent is irrigated either by surface irrigation or by subirrigation. Twenty-four of the sixty-one farms have some cropland that is not irrigated, but the total acres of dry-farmed land is relatively small when compared with the total acreage of irrigated land. (Figure 3.)



Figure 3. Crested wheatgrass being grown for seed on unirrigated land.

The acreage for range land does not include publicly owned grazing land used under a Grazing Service allotment or a Forest Service permit. In addition to operating private grazing land, 29 farms had allotments for cattle, 9 had allotments for sheep, and 7 had Forest Service permits for both cattle and sheep.

CROPPING SYSTEM

Variation by types of farming. The acreage of the different crops varies considerably between types of farming (Table 2). Hay is the most important crop in respect to acreage on all five farming types. The percentage of cropped acres devoted to hay varies from 80 per cent on the cattle and sheep ranches to 48 per cent on the general livestock farms with an average of 74 per cent for all farms. The dairy and crop farms have 67 and 71 per cent, respectively, of their crop acres in hay, so it is apparent that with the exception of the general livestock farms, hay is the major crop. (Table 38, Appendix and Figures 4 and 5.)

Dairy, general livestock, and crop farms have a considerably higher percentage of their crop acres in grain than either the beef cattle or sheep ranches although their total acreage is smaller. This is to be expected since relatively more grain is required for dairy cattle and general livestock than for range cattle or sheep.

Table 2. CROP ACREAGES PER FARM BY TYPES OF FARMING
Keating Area, Baker County, Oregon, 1939

Crop	Acres per farm by type of farming					All farms Acres
	Beef cattle	Range sheep	Dairy	General livestock	Crop	
	Acres	Acres	Acres	Acres	Acres	Acres
<i>Hay</i>						
Alfalfa hay	112.7	283.0	43.7	29.3	52.8	82.5
Wild hay	80.4	.....	7.9	1.7	8.2	24.5
Other hay	16.1	70.3	1.3	3.7	5.9	13.1
TOTAL HAY	209.2	353.3	52.9	34.7	66.9	120.1
<i>Grain</i>						
Barley	14.9	16.0	4.9	15.3	3.8	11.4
Oats	12.1	25.2	7.2	7.8	5.7	10.2
Wheat	8.8	3.3	5.5	8.5	8.6	7.4
Other grains	3.7	.....	3.0	2.4	4.7	3.1
TOTAL GRAIN..	39.5	44.5	21.0	34.0	22.8	32.1
<i>Miscellaneous</i>						
New seedings	10.7	43.7	2.9	2.2	1.8	8.6
Seed	2.4	.....	.9	.1	2.2	1.2
Garden .....	.9	.8	.8	.4	.6	.7
Other .....	.2	.....	.1	.2	.....	.1
TOTAL MISCEL- LANEOUS	14.2	44.5	4.7	2.9	4.6	10.6
TOTAL CROP ACRES	262.9	442.3	78.6	71.6	94.3	162.8

Crop yields. Crop yields may materially affect the income of the farm. The cost of producing the total crop usually remains relatively fixed while the yield may vary considerably. Water charges, taxes, interest on investment, and preharvest labor do not change with variations in yield, while harvest labor and certain machine costs vary with changes in the yield, but these changes in expenses are usually comparatively less than the accompanying changes in yield.

Table 3 gives the 1938 yield, the "usual" yield, and the per cent that the 1938 yield is of the "usual." It is entirely possible that the "usual" yield has

Table 3. 1938 AND "USUAL" CROP YIELDS
Keating Area, Baker County, Oregon, 1939

Crop	1938 yield	"Usual" yield	Per cent 1938 yields are of "usual" yields
Alfalfa hay (1 cutting)—Tons.....	1.5	1.7	88.8
Alfalfa hay (2 cuttings)—Tons.....	2.3	3.1	74.7
Alfalfa hay (3 cuttings)—Tons.....	3.7	4.0	91.6
Wild hay—Tons	1.4	1.5	96.1
Wheat—Bushels	29.1	31.9	91.4
Barley—Bushels	46.9	52.2	89.8
Oats—Bushels	69.2	66.6	103.5
ALL CROPS .....	.....	.....	85.1

been slightly overestimated by the operators. The widest difference between the 1938 yield and the "usual" occurred in the case of "two-cutting" alfalfa hay. The 1938 yield for this crop was 25 per cent less than "usual."



Figure 4. Haying lasts all summer on the larger ranches. Wild hay accounts for about 20 per cent of the acreage in hay and about 15 per cent of the total crop acreage.

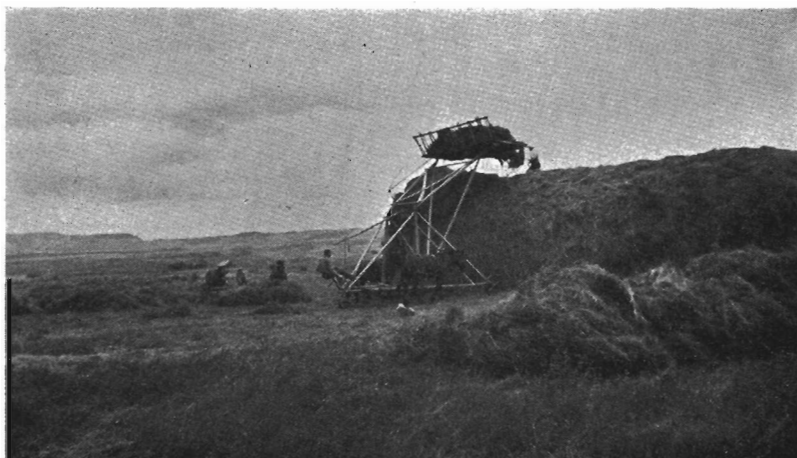


Figure 5. Stacking alfalfa hay on a beef cattle ranch. Two cuttings are usually harvested while the third crop is pastured. Alfalfa hay averages 113 acres per ranch and accounts for 43 per cent of the total acres in crop.

Factors affecting crop yields. In this area climatic conditions, soil fertility, drainage, cropping practices, insect pests, and noxious weeds affect yields.

1. **Climatic conditions.** The freezing out of alfalfa stands, wind damage to grains, and rains while the hay is in the shock are about the only climatic conditions that affect yields. Precipitation in this immediate area seems to have little bearing on the water supply under the Thief Valley Irrigation Project.* Several of the operators who have private water sources, however, reported a shortage.

2. **Soil fertility.** The yields of the Keating Area compare quite favorably with those of the other nearby regions of similar climate and topography (Table 4). These figures suggest that the Keating Area's soils are as fertile as those found in the irrigated districts of Malheur County.

Table 4. 1938 CROP YIELDS ON FOUR IRRIGATED DISTRICTS IN EASTERN OREGON

Crop	Yield per acre			
	Keating area	Ontario-Nyssa* (older districts)	Vale* (new districts)	Jordan Valley† (new districts)
Alfalfa hay (3 cuttings)—Tons.....	3.7	4.4	3.4	2.8
Wheat—Bushels	29.1	36.5	25.6	25.0
Barley—Bushels	46.9	41.8	28.8	25.9
Oats—Bushels	69.2	57.3	35.8	32.1

* Heisig, Carl P., and Clawson, Marion, "New Farms on New Land," Bureau of Agricultural Economics, 1938, page 100.

† Oregon State Engineer's Report, 1938.

3. **Drainage.** According to the operators, drainage is becoming a problem on several of the farms in the area. The results of inadequate drainage are showing up in the form of wet and marshy land and also in an increasing alkali content of the soil. Although the acreage that has been retired from cultivation is relatively small, a future, increasingly important problem does exist.

4. **Insect pests.** In many irrigated regions of Oregon that raise alfalfa, the alfalfa weevil is quite prevalent. At the present time this is especially true of the Keating Area. According to the farmers of this area, the weevil has reduced alfalfa hay yields to such an extent that several of the operators have replaced or supplemented their alfalfa with red clover, which is not affected by the weevil. In some fields the weevil larvae have made such a vigorous attack on the alfalfa, especially the first cutting, that the growing alfalfa takes on a ragged, gray appearance.

The operators of this area reported that the 1938 yield of alfalfa hay was 22 per cent lower than the yield usually received, while the yield for crops other than alfalfa was 96 per cent of normal. This difference between the 1938 yield of alfalfa and the usual yield suggests that the 1938 yield may have been materially affected by the weevil.

5. **Noxious weeds.** Whitetop, morning glory, Russian knapweed, Canadian thistle, and quackgrass are found. Whitetop is a menace and occurs in

* Powder River's main source of flow is derived from its head waters located in the Blue Mountains in western Baker County. Its drainage basin covers about 1,100 square miles.

varying degrees of infestation on most of the farms. The operators report that it is spreading rapidly, but at present has caused no appreciable change in yields. The extent of the infestation of the other weeds is insignificant at the present and the weeds are confined to relatively few farms.

Crop marketing. The area is relatively self-sufficing with regard to feed crops. Only 70 tons of grain were purchased and 42 tons of grain sold outside the area. One operator purchased and one operator sold his hay outside the area. Apparently the balance between feed crops produced and the number of livestock on the 61 farms is relatively close. On the other hand, over 34,000 pounds of the alfalfa seed produced was sold outside the area. Most of this seed was sold in Baker, but some was sold in La Grande and Ontario.

THE LIVESTOCK PROGRAM

Kinds and numbers of livestock. In this area the animal units of livestock per farm vary from 6 to over 1,200 animal units. The average is 128.

Range cattle and range sheep are by far the most important livestock in the area and account for about 75 per cent of the total animal units.

The sheep ranches have the largest number of animal units and are followed by the beef cattle ranches, dairy farms, general livestock farms, and crop farms in respective order (Table 5).

Table 5. ANIMAL UNITS PER FARM BY TYPES OF FARMING
Keating Area, Baker County, Oregon, 1939

Kind of livestock	Type of farming					All farms
	Beef cattle	Sheep	Dairy	General livestock	Crop	
	<i>A.U.</i>	<i>A.U.</i>	<i>A.U.</i>	<i>A.U.</i>	<i>A.U.</i>	<i>A.U.</i>
Beef cattle	166.2	94.4	2.1	5.0	2.7	55.1
Range sheep	13.6	376.3	.....	.....	.....	40.6
Dairy cattle	10.1	10.2	22.1	12.3	6.8	13.1
Workstock	15.9	23.2	7.5	6.5	5.8	10.4
Miscellaneous*	13.6	13.2	7.5	7.7	4.0	9.3
All livestock	219.4	517.3	39.2	30.5	19.3	128.5

* Includes horses not worked, hogs, farm sheep, and poultry.

Beef cattle occur on all the types of farming, but are most important on the beef cattle and sheep ranches. Range sheep are confined to the sheep ranches with the exception of one instance where the operator of a beef cattle ranch had range sheep during a short period of the fiscal year. Dairy cattle occur on all farms, and though they account for only 10 per cent of the total animal units of livestock in the area, they are the most important class of livestock on the 39 farms comprising the dairy, general livestock, and crop farms.

The table indicates that range cattle and range sheep are the most important classes of livestock insofar as total animal units are concerned, but dairy cattle are the most important on the largest number of farms.

BEEF CATTLE PRACTICES

Beef cattle practices notable for this area include grazing, winter feeding, breeding practices, and production and sales practices.

Grazing. The grazing season for beef cattle is divided into three distinct periods: spring, summer, and fall. Spring grazing lasts from early April until early June and in all cases consists of sagebrush range, either publicly or privately owned, or both. (Figure 6.)



Figure 6. Note the bunch grass inside the fence. The fenced area on the right illustrates the importance of sound range management practices.

Several types of summer grazing are available. Eight operators grazed their cattle on the national forest, 6 used sagebrush range and private timberland, and 2 used farm pasture. Those operators using the national forest moved their cattle on in early June and took them off in late October.

Most of the operators use a combination of private and publicly owned range land for fall grazing, but several operators have enough farm pasture to carry the cattle until winter feeding begins. (Figure 7.)

Winter feeding. Winter feeding usually begins in early December and lasts until the early part of April. The operators reported that the cattle are fed about $1\frac{1}{2}$ tons of hay per animal unit or about 750 pounds per month for the 4 months of winter feeding. Some wild hay and clover hay are fed, but alfalfa constitutes the largest percentage.

Breeding. About 1 bull for every 20 cows is used. The largest operators keep the bulls well scattered among the cows. Over 70 per cent of the bulls are Herefords, the remainder are Angus and Shorthorn.

Production and sale of beef cattle. The per cent calf crop is the number of calves weaned as a per cent of the number of cows at breeding time. The calf crop is for 1938 and not 1939 since the fiscal year covered by the study ended on May 31, 1939 and all the 1939 calves had not been born by that time.

The percentage calf crop varies from 50 per cent to 100 per cent with an average of 72 per cent. The data reported by the operators indicate that they "usually" received an average calf crop of 77 per cent. The average number of cows per beef cattle ranch is about 89 head. Over one-third the ranches have less than 50 head. This small number permits a closer watch over the cows during breeding and calving. These practices have a tendency to increase the calf crop on the smaller operating units.



Figure 7. Wild hay meadows, where available, provide summer and fall grazing.

About half the beef cattle are sold grass fat and are shipped in late summer or early fall. The others are grain fed on home ranches. The largest percentage of the cattle are shipped to Portland. Local and midwestern markets account for the remainder. The weights of the cattle sold and the average farm prices received per pound for the different classes of cattle are given in Table 6. The operators reported an average farm price of \$7.20 and \$5.50 respectively for two-year-old and yearling steers. This compares with an average of \$6.73 for the farm prices of fat steers in Baker County during the 10-year period 1926-1935. Oregon Station Circular of Information No. 161.

Table 6. BEEF CATTLE WEIGHTS AND AVERAGE FARM PRICES RECEIVED FOR BEEF CATTLE SOLD
Keating Area, Baker County, Oregon, 1939

Class	Weight per head	Prices received in 1933	
		Per hundred-weight	Per head*
	<i>Pounds</i>		
Cow	1,041	\$5.40	\$54
Heifers 2's	729	6.70	45
Heifers 1's	638	5.20	27
Bulls			65
Steers 2's	982	7.20	68
Steers 1's	645	5.50	34

* The average price per hundredweight times average weight per head will not give the price per head, since the price per head includes beef cattle whose weights are not known.

RANGE SHEEP PRACTICES

Two different methods of lambing are practiced in eastern Oregon; early lambing and late lambing. Early lambing means lambing while the ewes are on hay during February and March. The lambs are sold in July and August. Late lambing means lambing in April when the ewes are on the spring range. The lambs are marketed in the fall.

Those operators who practice early lambing must have heavier lambs and a higher percentage lamb crop in order to offset the additional expense entailed by sheds and heavier feeding.

Conditions of the Lower Powder River Area are well adapted to early lambing and the six sheep operators included in this study follow that practice. There appears to be plenty of good hay at a reasonable price for winter feeding, and the grazing is good enough to permit fat lambs to be marketed in late July and early August.

Grazing. The grazing period for sheep is similar to that of cattle. Spring grazing lasts from about the first of April to the first part of June, and consists of grazing on either privately or publicly owned sagebrush range land, or both. Summer grazing extends from June to the middle of September and is located on the Whitman National Forest (Figure 8). Fall grazing lasts from the time the sheep are moved off the forest until winter feeding begins. During this last period, sheep are grazed on sagebrush range land, crop aftermath, or irrigated pasture.

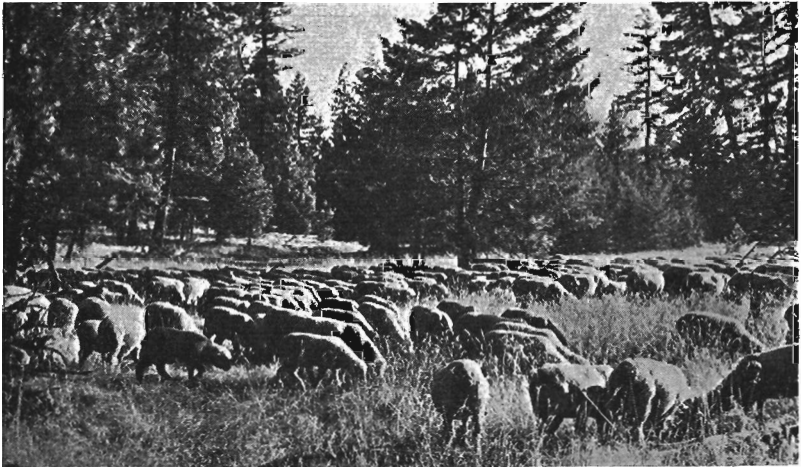


Figure 8. All the range sheep in this area are grazed on the national forest during the summer months.

Winter feeding. Winter feeding usually begins near the first of December and lasts until about April 1, depending on the weather. During this period the sheep are fed about 600 pounds of alfalfa hay per head or about 5 pounds per day.

Replacements. Sometime during the fall adjustments are made in the number of breeding ewes for the ensuing year. At this time, on account of

age or other defects, ewes that would not be profitable to keep for another year are culled out and sold. The method of replacement differs between operators; two operators made no replacements during the year of the study; two made replacements with their own ewe lambs; one purchased ewe lambs; and the other operator purchased yearling ewes. The average addition to ewes made in the fall of 1938 totals 24.9 per cent of the breeding ewes. Seven and three-tenths per cent of replacements occurred because of death loss and 12.4 per cent occurred as a result of culling aged and barren ewes. The remaining 5.2 per cent addition represents an increase in the number of ewes over the number the previous year.

Breeding. After adjustments in the number of ewes have been made, the bucks are turned in with the ewes at the rate of about 1 buck to 50 ewes. They remain with the ewes for 1 to 2 months. The bucks are usually of the Hampshire type.

Lambing. Weather conditions at lambing time are usually quite severe, and the use of heated lambing sheds is an accepted practice. After the lambs are dropped the ewes and lambs are taken from the lambing shed to outside shelters where they remain until the lambs will stay with the ewes in larger pens or corrals.

Shearing. In the latter part of June, the ewes and lambs are trailed from spring range to shearing corrals where the ewes are shorn and the ewes and lambs counted. The shearing is contracted on the head basis to professional shearers. During 1939 the shearing rate averaged about 18 cents per head.

Production and sale. The production of wool per ewe on the different ranches ranged from 8.8 pounds to 10.7 pounds. The average for all ranches is 10.1 pounds. The average for the state during the same period is 8.9 pounds.

The average price received by the six operators in this study for the 1939 clip was 20.4 cents. Over the 10-year period 1926-1935 the farm price of wool in Baker County averaged 22.9 cents per pound.* The wool is usually sold during the summer, either through a wool pool or through private concerns.

The average lamb crop in this study is computed on the number of lambs at shearing time and the number of ewes at breeding time. The 1939 lamb crop per ranch varied from 93 per cent to 126 per cent with an average for all sheep ranches of 113 per cent. The operators reported that they usually received a lamb crop that averaged 112 per cent, so there appears to be very little difference between the 1939 and "usual" lamb crops. The lamb crop is based on the lamb count at shearing time in May and not the number of lambs at market time in July or August. It is evident, therefore, that the lamb crop would have been lower if computed when the lambs were marketed, because of the death loss of lambs between shearing and marketing.

Lambs are marketed as fat lambs during the latter part of July and early August. Those to be sold are separated from the ewes while on the national forest and are either trailed or trucked to the railroad shipping point. The lambs are then consigned to midwestern markets including Denver, Omaha, Kansas City, and Chicago.

The weight of lambs sold from the different ranches varied from 78 pounds to 87 pounds. The average weight for all lambs sold in 1938 was 82 pounds. This is almost identical with the weight that the operators indicated as "usual."

* Oregon Station Circular of Information No. 161.

The average farm price received for lambs sold during the summer of 1938 was \$6.83 per hundredweight or \$5.60 per head. The 10-year average farm price (1926-1935) received for fat lambs in Baker County was \$7.57 per hundredweight.*

Dairy farm practices. The dairy cattle are for the most part a mixture of beef and dairy stock. This mixture results from the common practice of using beef bulls on dairy cows. The mixed breeding undoubtedly contributes to the area's low butterfat production.

The dairy cows are pastured during the spring, summer, and fall months on irrigated pasture, or on range land if no irrigated pasture is available. On the average, each cow received from 2 to 2½ tons of hay during the year.

Butterfat production per cow ranged from 340 pounds to less than 100 pounds, with an average for the study of 204 pounds. The state average for 1939 is approximately 236 pounds. Of the total butterfat produced, 68 per cent was sold, 17 per cent was used in the home, and 15 per cent was fed to farm livestock. The amount of butterfat, in the form of whole milk fed to calves, averaged 32 pounds per calf, or when measured in terms of value about \$7.60 per calf.

The butterfat is sold in the form of churning cream and is picked up at the farm by the creamery's truck and delivered to Baker. The average farm price received by the farmer for butterfat averaged 24 cents per pound.

Miscellaneous farm livestock practices. Income from poultry, farm sheep, and hogs is important to many of the smaller operators.

1. **Poultry.** The poultry enterprises consist entirely of farm flocks. None of these flocks have more than 200 hens and average about 50. The average production amounted to 9.8 dozen or 118 eggs per hen. The eggs sold brought an average price of 21 cents per dozen.

2. **Farm sheep.** Farm sheep consist of ewes and lambs kept on the farm during the entire year. Most of the flocks have about 50 ewes. Several operators have no ewes, but obtain "orphan" or "bummer" lambs at no cost from range sheep operators.

The weight per fleece and the per cent lamb crop for the ewes in the farm flocks were lower than for range ewes. The fleece weight averaged 8.7 pounds and the lamb crop, based on lambs on hand June 1, 1939, averaged 97 per cent. The operators indicated that their "usual" lamb crop was 100 per cent.

The farm lambs sold were heavier than the range lambs. On the average they weighed 86.6 pounds and brought a farm price of 6.9 cents. The operators reported that their lambs "usually" weighed 84.4 pounds when sold.

3. **Hogs.** The production of hogs is important on many of the farms and much of the grain, especially barley, is marketed through hogs.

Approximately 60 per cent of the sows farrow in the spring and the remainder farrow in the fall. The spring litters averaged 6.4 pigs saved per litter while the fall litters averaged 6.8 pigs. The average number of pigs saved per litter for both spring and fall was 6.6, which is exactly the 10-year state average for Oregon.

Most of the hogs are sold in Baker and then shipped to Portland. The fat hogs sold averaged 196 pounds per head and brought an average of \$7.37 per hundredweight.

* See Table 40, Appendix, for a list of investments per cattle unit.

DISTRIBUTION OF FARM INVESTMENT

There is a wide variation in total farm investment between range livestock ranches and other types of farming (Table 7). The total capital invested in sheep ranches is almost twice greater than the capital invested in cattle ranches, and cattle ranches in turn are over four times larger by investment than dairy, general livestock, and crop farms.

LAND

Land represents 58 per cent of the total farm investment. By types of farming, the investment in land varied from 54 per cent on sheep ranches to 70 per cent on crop farms. All livestock farms had relatively less of their total farm capital invested in land than did the eight crop farms. It should be noted that although the sheep and cattle ranches had a smaller proportion of their total investment in land than the crop farms, the total investment in land was much greater—the sheep ranches' investment in land being seven times larger and the cattle ranches' four times larger than the crop farms.

LIVESTOCK

Livestock represents the second largest item included in total farm investment. It varies from 8 per cent on crop farms to 30 per cent on sheep ranches. The percentage investment in livestock on sheep and cattle ranches may be considerably lower than on similar types of ranching in other parts of the country. It must be remembered, however, that the ranch outfits in this area winter feed their livestock for a period of four months, and practice shed lambing. These methods of handling livestock entail a considerably higher investment in land, buildings, and equipment (therefore a lower percentage investment in livestock) than would be necessary on outfits depending on winter range, with small amounts of hay and grain being fed.

BUILDINGS

The sheep and cattle ranches had a much greater investment in buildings, but when expressed as a percentage of the total ranch investment this item was smaller than for any of the other three farming types. This condition is ordinarily expected on large farms, because of the operator's tendency to have as much of the total capital as possible invested in the direct productive agents, land and livestock. The per cent investment in buildings varied from 8 per cent on sheep ranches to 17 per cent on dairy farms, with an average of 10 per cent for all farms.

MACHINERY AND EQUIPMENT

Farm machinery and equipment consisting of nonpower and power equipment; tractors, combines, farm trucks, and the farm share of the automobile, accounted for 6 per cent of the total capital investment for all farms. By types of farming the per cent of total investment ranged from 4 per cent on sheep ranches to 10 per cent on crop farms. The sheep ranches had the largest investment while dairy farms had the smallest. For the most part, the relatively large investment in machinery and equipment on sheep ranches results from these outfits having so many more acres in crops than the other types of

Table 7. DISTRIBUTION OF TOTAL FARM INVESTMENT BY TYPES OF FARMING*
Keating Area, Baker County, Oregon, 1939

Item	Type of farming										All farms	
	Beef cattle		Sheep		Dairy		General livestock		Crop			
	Average	Per cent	Average	Per cent	Average	Per cent	Average	Per cent	Average	Per cent	Average	Per cent
Land	\$27,757	59.9	\$49,044	53.9	\$ 6,025	56.5	\$ 6,149	59.7	\$ 7,731	70.2	\$16,215	58.2
Livestock	11,725	25.3	27,227	29.9	1,728	16.2	1,420	13.8	903	8.2	6,664	24.0
Buildings	4,217	9.1	7,242	7.9	1,846	17.3	1,679	16.3	1,157	10.5	2,861	10.2
Machinery and equipment.....	2,124	4.6	4,217	4.6	919	8.6	947	9.2	1,107	10.0	1,592	5.7
Miscellaneous	477	1.1	3,259	3.7	147	1.4	101	1.0	124	1.1	525	1.9
TOTAL FARM INVESTMENT	\$46,300	100.0	\$90,989	100.0	\$10,665	100.0	\$10,296	100.0	\$11,022	100.0	\$27,857	100.0

* As of June 1, 1938

farming. Also they have a considerable investment in camp and pack equipment, which usually does not occur on the other types of farming.

FINANCIAL SUMMARY

FARM RECEIPTS

The receipts on the sheep and cattle ranches were much larger than on the other types of farms (Table 8 and Table 39, Appendix). Of the total \$328,624 cash receipts for 61 farms, \$276,154 or 84 per cent is derived from the sale of livestock and livestock products, 10 per cent is from the sale of crops, and 6 per cent is from miscellaneous sources. Agricultural Adjustment Administration payments made up the largest share of the miscellaneous items, being 3 per cent of the total cash receipts or 55 per cent of the miscellaneous receipts.

The cash sale of livestock and livestock products accounted for 95 per cent of the total receipts on the sheep ranches, 82 per cent of the total receipts on the cattle ranches, 51 per cent on the dairy, and 58 per cent on the general livestock farms. On the crop farms, 50 per cent of the total receipts were derived from sales of crops.

Table 8. FINANCIAL SUMMARY BY TYPES OF FARMING*
Keating Area, Baker County, Oregon, 1939

Item	Type of farming					All farms
	Beef cattle	Sheep	Dairy	General livestock	Crops	
<i>Receipts:</i>						
Total cash receipts	\$ 8,381	\$20,396	\$ 1,883	\$ 1,762	\$ 2,075	\$ 5,400
Inventory increase	356	277	834	233	485	440
TOTAL FARM RECEIPTS	\$ 8,737	\$20,673	\$ 2,717	\$ 1,995	\$ 2,560	\$ 5,841
<i>Expenses:</i>						
Total cash expenses	5,149	13,923	1,680	1,153	1,262	3,593
Unpaid family labor	511	470	164	190	168	293
Inventory decrease .....	.....	.....	.....	.....	.....	.....
TOTAL FARM EXPENSES	\$ 5,660	\$14,393	\$ 1,844	\$ 1,343	\$ 1,430	\$ 3,886
NET FARM INCOME	3,077	6,280	873	652	1,130	1,955
Farm furnished living	592	616	404	359	317	450
Interest on investment at 4 per cent	1,859	3,645	443	417	451	1,123
OPERATOR'S LABOR INCOME	1,218	2,635	430	235	679	832
Value of operator's time	973	1,351	677	663	600	807
Return on investment	2,104	4,929	196	-11	530	1,148
PER CENT RETURN ON INVESTMENT..	4.5	5.4	1.8	-1	4.7	4.1
Total investment....	\$46,478	\$91,127	\$11,082	\$10,413	\$11,264	\$28,077

* For a detailed listing of receipts and expenses see Table 39, Appendix.

FARM EXPENSES

The sheep and cattle ranches are larger and they spend relatively less for machinery and equipment expenses. They spend a higher percentage for labor and board, however, since the operators cannot do as much of the work themselves. The average expense for each farming type includes a wage estimated by the operator for the work performed by the unpaid members of the operator's family.

NET FARM INCOME

Net farm income is secured by subtracting the total farm expenses from the total farm receipts after all inventory changes have been accounted for. It is the income from which the operator's wage for his labor and management and the interest on total farm capital must be paid. The net farm income received by the operators varied from \$6,280 on the range sheep ranches to \$652 on the general livestock farms. The average for all farms was \$1,955.

FARM-FURNISHED LIVING

In addition to the net farm income, these families also received noncash items in the form of farm-furnished food and a home to live in. The average value per farm for farm-furnished living is \$450, of which \$64 is garden produce, \$78 livestock, \$124 livestock products, \$38 wood, and the remaining \$146 is rent on the farm dwelling. The farm-furnished food is valued at wholesale. The rental value of the home is figured at 10 per cent of the inventory value of the house.

LABOR INCOME

Labor income measures the income of the farm operator after the influence of size of business; namely, total farm capital has been removed. When 4 per cent of the total capital per farm is subtracted from the net farm income the remainder or labor income is the amount that the operator has earned for his year's labor and management, not including farm-furnished living.

There is a wide variation in labor income between the different types of farming (Table 8). The probable reasons for this variation will be discussed later. The range sheep ranches received the highest labor incomes, whereas the general livestock farms received the lowest. The average for all farms was \$832. It is interesting to note that the average labor income received by the operators is \$25 greater than the average amount that they estimated their labor and management to be worth.

VALUE OF OPERATOR'S WAGE FOR LABOR AND MANAGEMENT

In many economic studies an arbitrary wage for the operator's labor and management has been assigned to the operator, usually depending on the size of his business. In this study the operators estimated the wage for their own labor and management. The average value of the operator's wage for each type of farming is as follows: beef cattle ranches, \$973; sheep ranches, \$1,351; dairy farms, \$677; general livestock farms, \$663; and crop farms, \$600.

RETURN ON FARM INVESTMENT

The per cent return on farm investment averaged 4.1 per cent for all farms. This figure is calculated by subtracting the value of the operator's wage from net farm income and dividing the remainder by the total farm investment.

REPRESENTATIVENESS OF DATA

The previous discussion has pointed out that on the average the operators for the one year made no extremely large nor extremely small incomes, but earned a fair rate of return on their investment, about 4 per cent, and were paid a wage that was slightly more than they considered their year's labor and management to be worth.

Since the data in this report represent only the one year, June 1, 1938 to May 31, 1939, it is important to know whether this is a typical year. It is impossible to say whether the period of this study will be representative of future years, but a comparison of the 1938 data with long-time averages may prove helpful.

Table 9. COMPARISON OF 1938 FARM PRICES TO 10-YEAR AVERAGE FARM PRICES (1926-1935) FOR BAKER COUNTY

Keating and Sparta Areas, Baker County, Oregon, 1939

Item	Prices reported by farmers for 1938	10-year average farm prices received (1926-1935)*
Wheat—Bushel	\$0.58	\$0.82
Oats—Bushel .....	.32	.43
Barley—Bushel .....	.45	.59
Steers (fat)—Hundredweight	7.14	6.73
Lambs (fat)—Hundredweight	6.83	7.57
Hogs (fat)—Hundredweight	7.37	7.77
Wool—Pounds .....	.20	.23
Butterfat—Pounds .....	.24	.34
Eggs—Dozen .....	.21	.26

* Oregon Station Circular of Information No. 161.

Crop yields and livestock production. The farmers reported their crop yields in 1938 as being approximately 15 per cent lower than yields "usually" received. Livestock production rates including calf crop, lamb crop, and livestock weights were essentially the same as "usual."

Prices. The prices received for farm products sold during the period varied considerably from the 10-year average farm prices for Baker County (Table 9). Farm prices received for crops in 1938 were much lower than for the 10-year average, but the prices received for livestock in 1938 will average about the same as those received in the period 1926-1935. Consequently, 1938 appears to be a fairly typical year insofar as prices are concerned, but below normal with respect to crop yields.

SOME REASONS FOR VARIATION IN INCOME

The following discussion deals with the reasons why certain farms receive a greater income than others. Each type of farming has inherent characteristics that distinguish it from other types of farming. Factors associated with the

variation in income on one type of farming, therefore, may be different or may be of different magnitude than those on another type of farming. For these reasons the analysis will attempt to point out strong and weak points within types of farming. In the following discussion it must be remembered that the period covered by this study represents only one year, and whether or not this year will be typical of future years is beyond our knowledge. It has been pointed out in the previous discussion, however, that this is a fairly typical year insofar as the past is concerned.

BEEF CATTLE RANCHES

The average financial income received by the operators of beef cattle ranches is neither extremely high nor low, but it is large enough to pay all ranch expenses, pay the operator \$1,218 for his labor and management, and return 4 per cent interest on the total ranch investment. The incomes of the individual operators were subject to considerable variation. The highest labor income received was over \$5,000 and the lowest was a loss of approximately \$2,000 with an average for all ranches of \$1,218. Naturally this variation in income is a result of definite causal factors. The following discussion will attempt to point out certain of these factors as revealed by this study.

Per cent of total investment in livestock.* The per cent invested in livestock gives the relative importance of the investment in livestock to the total ranch investment. The data indicate that increases in percentage investment in livestock are accompanied by increased labor income (Table 10). Gross returns per cattle unit were considerably lower on ranches having the largest relative investment in livestock. This, however, was more than offset by lower feed, labor, and land charges per cattle unit. The outfits with the highest percentage investment in livestock had livestock returns above feed and labor costs averaging \$6.40 per cattle unit, whereas the group of ranches having less than 10 per cent invested in livestock received a minus 40 cents for the same item.

Table 10. PER CENT INVESTMENT IN LIVESTOCK AND INCOME ON 16 BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Per cent investment in livestock		Number of ranches	Labor income	Number cattle units*	Livestock returns per cattle unit*	Land charge per cattle unit*
Group	Average					
	<i>Per cent</i>					
Under 20	9.6.....	4	\$ 434	114.7	\$34.00	\$14.20
20 to 30	22.9.....	8	942	189.0	30.80	8.50
30 and over	42.3.....	4	2,553	321.2	22.50	4.80
All beef cattle ranches	25.3.....	16	\$1,218	203.5	\$28.00	\$ 7.40

* See pages 53-54, Appendix, for explanation of terms.

It is commonly said that the investment in livestock should be equal to the investment in land. These ranches did not attain this ideal but the nearer they came to it the higher the labor income.

* See Table 40, Appendix, for a list of investments per cattle unit.

Feeding. Relatively heavier feeding of breeding stock was associated with a larger calf crop and higher gross returns per cattle unit, but the added returns were not enough to pay the added cost. In this area, labor income is affected very little by the amount of hay fed per hay-consuming animal unit even though the calf crop and returns per cattle unit were higher on the ranches feeding the most hay (Table 11). The group of ranches feeding 2.4 tons of hay per hay-consuming animal unit received the highest livestock return per cattle unit, but higher feed costs reduced the livestock return above feed costs to a figure below that of the group feeding 1.77 tons per animal unit.

Table 11. TONS HAY FED PER HAY-CONSUMING ANIMAL UNIT AND INCOME ON 16 BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Tons hay fed per hay-consuming animal unit		Number of ranches	Labor income	Number of cattle units	Per cent calf crop	Livestock returns per cattle unit	Livestock returns above feed costs per cattle unit
Group	Average						
Under 1.5	1.11.....	6	\$1,070	234.5	67.0	\$24.00	\$14.20
1.5 to 2.0	1.77.....	6	1,526	235.5	73.7	29.30	18.40
2.0 and over	2.40.....	4	975	108.9	71.0	36.60	16.50

Table 12. RATE OF FEEDING AND INCOME ON 16 BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Value feed fed per cattle unit		Number of ranches	Labor income	Number of cattle units	Livestock returns per cattle unit	Livestock returns above feed costs per cattle unit	Acres private range per cattle unit
Group	Average						
Under \$10	\$ 7.20..	4	\$2,896	372.0	\$23.70	\$16.50	13.5
\$10 to \$15	12.60..	7	899	152.7	31.20	18.60	22.9
\$15 and over	19.50..	5	321	139.7	31.90	12.40	28.3

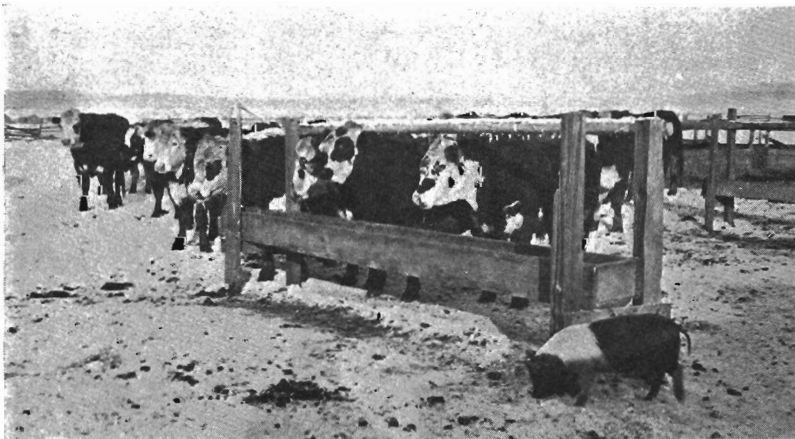


Figure 9. About one-half of the steers are fattened on the home ranch before being sold.

Hay fed is not the best measure for the feed consumed on beef cattle ranches since several of the operators fatten their steers before marketing (Figure 9). For this reason the total value of feed fed (including hay and grain) may be better than hay fed as an indicator of any relationship existing between the amount or value of feed fed and the labor income received.

The ranches spending the least amount for feed per cattle unit received the largest labor income, although their per cent calf crop and gross returns per cattle unit were less than on the ranches feeding the heaviest (Table 12). The lower feed and labor costs and the larger number of cattle per ranch more than offset the larger returns. This indicates that heavy feeding may be carried too far.

Cattle units per man. The labor expense per cattle unit including a wage for the operator, amounts to more than the value of feed fed. The average labor expense per cattle unit is \$12.40, while the average value of feed fed per cattle unit (value of grazing on range and pasture not included) amounts to \$11.60. This accounts for all men, including the operator, whether they took care of livestock or worked in the field.

The ranches having more than 60 cattle units per man were far more profitable than ranches having less than 50 cattle units per man (Table 13). The ranches using the most labor (least number of cattle units per man) had a 5 per cent higher calf crop and had higher livestock returns per cattle unit than ranches using the least labor, but the added returns did not offset the added cost. Ranches with more than 60 cattle units per man received a livestock return of \$7.90 per cattle unit above feed and labor costs. The ranches with less than 50 cattle units per man received only \$1.80 per cattle unit above feed and labor costs.

In general the more efficient ranches were able to take care of more livestock per man due to the fact that they had over twice as many livestock as the least efficient ranches. A larger number of cattle units per man usually occurs on the larger ranches, for it is one of the internal efficiencies normally resulting from large scale operation.

Size of ranch. The data show that the larger ranches were distinctly the more profitable (Table 14). A study of the various items, however, indicates that the larger ranches differed not only in size, but in organization and management as well. Compared with the smaller ranches, they spent much less per head on feed and labor. They also use more public range and less private range, thus making their land costs less. The expenses of the larger ranches are therefore much smaller throughout. These economies are accompanied by a slightly smaller calf crop and a lower gross livestock return per head, but the livestock return above feed and labor costs per head was very much greater. In other words, the larger ranches were able to make major reductions in their expenses with only slight reductions in returns. These differences would seem to be due to management as well as to size of business; at least the data show no reason why the smaller ranches should have such heavy expenses. The indications are that the smaller ranches are being operated on the plan of using a large amount of feed and labor per head of livestock with the hope that the returns would be enough larger to make the operation profitable. Whether this program is intentional or unintentional, the results are unsatisfactory.

Comparison of high and low income ranches. A detailed comparison of these two groups is given in Table 15. This table brings out some striking

Table 13. LABOR EFFICIENCY AND INCOME ON 16 BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Cattle units per man		Number of ranches	Labor income	Number of cattle units	Livestock return per cattle unit	Labor cost per cattle unit*	Livestock return above feed and labor costs per cattle unit	Total ranch investment
Group	Average							
Under 50	41.1.....	6	\$ 686	109.8	\$34.40	\$17.80	\$ 1.80	\$32,255
50 to 60	56.8.....	6	722	171.7	27.60	13.50	-1.10	43,549
60 and over	106.0.....	4	2,759	398.5	25.50	9.50	7.90	72,206

* See page 54, Appendix, for explanation of terms.

31

Table 14. NUMBER OF CATTLE UNITS PER RANCH AND INCOME ON 16 BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Cattle units per ranch		Number of ranches	Labor income	Value feed fed per cattle unit	Labor cost per cattle unit	Livestock returns above feed and labor costs per cattle unit	Per cent calf crop	Acres private range per cattle unit	Land charge per cattle unit
Group	Average								
Under 125	101.2.....	6	\$ 588	\$15.50	\$18.80	\$-1.80	73.9	29.0	\$10.00
125 to 200	167.7.....	5	1,357	14.20	12.90	2.30	70.0	25.3	8.70
200 and over	362.0.....	5	1,834	9.10	10.10	6.60	70.5	14.1	6.00

facts. The first is that the returns per cattle unit on the high income ranches are not higher but are lower than on the low income ranches. The larger net income must therefore come from lower costs rather than from a larger gross return. This is confirmed by further examination of the data. These data show that the high net income ranches have (1) a lower investment per cattle unit; (2) lower feed costs; (3) lower labor costs; (4) lower land charges; and (5) lower machine costs. In spite of these lower costs they get larger calf crops and larger calf yields. The conclusion seems inescapable that good cattle management in this area requires the most rigid economy as to feed, labor and land charges, and that these economies can be and often are combined with a gross livestock return per head that is at least average, although not necessarily top. This type of management was found most commonly on the larger ranches, but not exclusively so. The opposite type of management was found most commonly on the smaller ranches, but here again there are exceptions because the five low income ranches were approximately average in size as measured by the total ranch investment.

Table 15. COMPARISON OF HIGH AND LOW INCOME BEEF CATTLE RANCHES
Keating Area, Baker County, Oregon, 1939

Item	Five high income ranches	Five low income ranches	All 16 beef cattle ranches
Labor income	\$ 3,138.00	\$ -368.00	\$ 1,218.00
Per cent return on investment	7.1	-1.0	4.5
Capital accumulation per year*	\$ 1,302.00	\$ 15.00	\$ 721.00
Total ranch investment	\$65,267.00	\$44,500.00	\$46,478.00
Acres in crop	388.4	218.4	262.9
Number cattle units	344.8	167.1	203.5
Investment per cattle unit	\$ 189.00	\$ 266.00	\$ 228.00
Per cent calf crop	72.7	67.0	71.0
Livestock returns per cattle unit	\$ 26.30	\$ 27.80	\$ 28.00
Value feed fed per cattle unit	\$ 7.80	\$ 14.50	\$ 11.60
Livestock returns above feed costs per cattle unit..	\$ 18.50	\$ 13.30	\$ 16.40
Labor costs per cattle unit	\$ 9.20	\$ 15.10	\$ 12.40
Livestock returns above feed and labor costs per cattle unit	\$ 9.30	\$ -1.80	\$ 4.00
Land charges per cattle unit	\$ 5.50	\$ 9.70	\$ 7.40
Acres private range per cattle unit	15.0	20.0	19.9
Grazing fees per cattle unit	\$ 0.50	\$ 0.38	\$ 0.45
Cattle units per man	95.0	54.6	66.8
Machine cost per crop acre*	\$ 2.30	\$ 4.70	\$ 3.10
Crop index*	117.1	111.0	112.4

* See pages 53-54, Appendix, for explanation of terms.

SHEEP RANCHES

The high income sheep ranches were not only the most successful during the 1 year, but also were most successful over a long period of time (Table 16). They had increased their net worth \$2,315 per year for a period of 16 years. The low income ranches had a capital accumulation averaging \$716 for 12 years.

The high income ranches included a one band and a two band outfit. Each of the low income ranches had one band. The general plan of management for both groups is similar. The investment per head, the number of sheep per crop acre, and the number of sheep units handled per man are about the same in both cases. The weight of lambs, the wool clip, and the total of feed and labor costs also were almost identical for each group. (Figure 10.) The

Table 16. COMPARISON OF HIGH AND LOW INCOME SHEEP RANCHES
Keating Area, Baker County, Oregon, 1939

Item	Two high income ranches	Two low income ranches	All six sheep ranches
Labor income	\$ 3,302.00	\$ 645.00	\$ 2,635.00
Per cent return on investment.....	7.0	2.2	5.4
Capital accumulation per year.....	\$ 2,315.00	\$ 716.00	\$ 868.00
Total ranch investment.....	\$69,910.00	\$47,506.00	\$91,127.00
Acres in crop.....	248	177	442
Number sheep units*.....	2,038.5	1,422.0	2,470.5
Number ewes.....	1,775.0	1,225.0	1,482.0
Man equivalent	5.95	4.12	6.8
Sheep units per man.....	343	345	363
Per cent lamb crop.....	120.9	114.3	113.4
Weight of lambs marketed.....	81.0	82.0	82.1
Pounds wool per ewe.....	9.6	9.7	10.1
Per cent death loss.....	5.5	8.5	7.3
Livestock returns per sheep unit.....	\$ 7.70	\$ 6.50	\$ 6.70
Value of feed fed per sheep unit.....	\$ 2.40	\$ 2.10	\$ 2.20
Labor cost per sheep unit.....	\$ 2.60	\$ 3.00	\$ 2.30
Livestock returns above feed and labor costs per sheep unit.....	\$ 2.70	\$ 1.40	\$ 2.20
Land charges per sheep unit.....	\$.89	\$ 1.20	\$ 1.09
Acres of private range per sheep unit.....	2.4	3.2	2.5
Grazing fees per sheep unit.....	\$.10	\$.14	\$.08
Machine cost per crop acre.....	\$ 7.50	\$ 8.00	\$ 5.00
Crop index	97.7	85.0	84.0

* See page 53, Appendix, for explanation of terms.

high income ranches, however, had a higher lamb crop, a lower death loss, lower land charges, higher crop yields, and smaller machine costs per crop acre.

The high income ranches were not especially outstanding in any one particular phase of management, but in several; so that when all these factors are taken together the more successful ranches had gross livestock returns

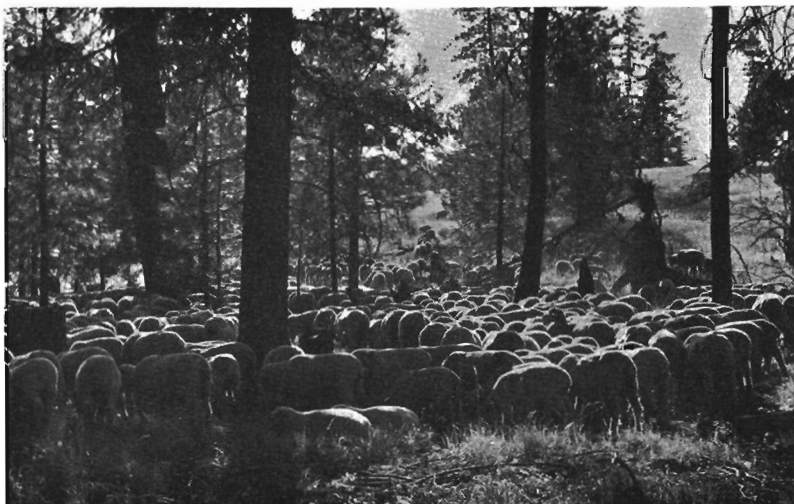


Figure 10. The lambs were sold off the national forest during July and August and averaged 82 pounds per lamb.

averaging \$2 higher, and net livestock returns averaging \$1.30 higher than the low income ranches. Considering the complete ranch business, the high income ranches received a labor income of \$1.60 per sheep unit, as compared to \$.45 for the less successful outfits.

DAIRY FARMS

Dairy farms received next to the lowest average labor income of any of the five types of farming. The labor income varies from minus \$248 to \$1,126 with an average of \$430.

Feeding. The rate of feeding has a very definite effect on the labor income (Table 17). Increases in feed are accompanied by increases in labor income, pounds of butterfat per cow, labor expense per cow, and crop yields.

Although the group of farms feeding the most received the largest labor income, the highest butterfat production per cow, the livestock return above feed costs per productive animal unit was highest in the middle group. An inspection of the individual records reveals that increases in the value of feed fed per productive animal unit up to \$20 are accompanied by relatively steady increases in net returns. Feeding above \$20 per productive animal unit was on the average unprofitable. Of the seven farms feeding more than \$20, the increased feeding was profitable in five cases and unprofitable in two. The cows on these two farms may have been of such poor quality that heavy feeding would not increase the returns to any great extent.

Table 17. RATE OF FEEDING AND INCOME ON 14 DAIRY FARMS
Keating Area, Baker County, Oregon, 1939

Value feed fed per animal unit productive livestock*		Number of farms	Labor income	Livestock return per productive animal unit	Livestock returns above feed costs per productive animal unit	Pounds butterfat per cow	Crop index
Group	Average						
Under \$15	\$11.70....	5	289	\$42.40	\$30.70	167.5	77.4
\$15 to \$25	20.00....	4	436	62.20	42.20	193.6	88.4
\$25 and over	31.10....	5	566	65.40	34.20	233.8	102.5
All dairy farms	\$19.30....	14	\$430	\$55.00	\$35.70	195.0	90.0

* See page 53, Appendix, for explanation of terms.

Table 18. SIZE OF FARM AND INCOME ON 14 DAIRY FARMS
Keating Area, Baker County, Oregon, 1939

Total productive man work units per farm		Number of farms	Labor income	Number of milk cows	Machine cost per crop acre	Productive man work units per man	Livestock returns above feed costs per productive animal unit
Group	Average						
Under 300	229.8.....	5	\$361	8.8	\$8.00	227.9	\$41.50
300 to 500	380.6.....	4	450	17.0	6.30	270.4	38.40
500 and over	575.6.....	5	483	20.7	4.10	276.2	31.30

Undoubtedly the efficiency of management and labor, the quality of live-stock, and the peculiarities found on the individual farm will determine the feeding policy, but it may prove helpful to know some of the problems that arise in case a change in feeding is contemplated.

Size of farm. The five largest dairy farms received a labor income of \$483, while the five smallest dairy farms received \$361. The largest farms have a much better opportunity of earning a better income since they have larger dairy herds, smaller machine costs per crop acre, and a greater labor efficiency (Table 18). The smaller farms, however, have a higher net return per cow than the larger farms. This situation is opposite to that occurring on beef cattle ranches, where the smallest ranches had the lowest net returns per animal unit.

Comparison of high and low income farms. A comparison of some of the factors on four dairy farms receiving the highest labor incomes and the four receiving the lowest labor incomes is given in Table 19. On the high income farms, crop yields are approximately 25 per cent better than on the low income farms, machine costs per crop acre are less, and butterfat production per cow is higher.

Table 19. COMPARISON OF HIGH AND LOW INCOME DAIRY FARMS
Keating Area, Baker County, Oregon, 1939

Item	Four high income farms	Four low income farms	All 14 dairy farms
Labor income	\$842.00	\$-37.00	\$430.00
Total productive man work units.....	392.0	406.0	396.4
Man equivalent	1.34	1.77	1.51
Productive man work units per man.....	292.3	228.8	263.1
Animal units productive livestock.....	25.4	37.3	31.8
Animal units productive livestock per crop acre.....	0.24	0.62	0.4
Acres in crop	103.7	78.6	78.6
Number of milk cows.....	16.0	14.1	15.4
Livestock returns per productive animal unit.....	\$ 64.50	\$ 45.20	\$ 55.00
Pounds of butterfat per cow.....	207.3	195.0	195.0
Value of feed fed per productive animal unit.....	\$ 27.20	\$ 16.20	\$ 19.30
Livestock returns above feed costs per productive animal unit	\$ 37.30	\$ 29.00	\$ 35.70
Crop index	105.6	79.0	90.0
Machine cost per crop acre.....	\$ 3.20	\$ 7.10	\$ 5.40

Although the high income group uses \$11 more feed per productive animal unit, they receive \$8.30 more returns above feed costs. The practice of feeding more may be the result of the quantity of feed available. The high income group, though feeding 40 per cent more feed, produced a surplus of \$481 worth of feed crops, while the low income farms did not produce enough for their own use. On an average the low income farms purchased about \$70 worth of feed per farm.

The higher income group had more acres in crop, but had fewer animal units, so when size is measured by productive man work units the two groups of farms are relatively the same size. The more successful farms had an average of 1.34 men working, as compared with 1.77, but accomplished approximately the same amount of work. Each man took care of 229 days of work on the low income farms as compared with 292 days on the high income farms.

The machinery cost per crop acre on the high income farms was \$3.20 as compared with \$7.10 on the low income group, yet the crop yields were higher.

This difference is greater than can be explained by the size of the farms and would therefore seem to be due to management.

Table 20. LABOR EFFICIENCY AND INCOME ON 17 GENERAL LIVESTOCK FARMS
Keating Area, Baker County, Oregon, 1939

Productive man work units per man		Number of farms	Labor income	Machine cost per crop acre	Livestock returns above feed and labor costs per productive animal unit	Productive man work units per farm
Group	Average					
Under 200	150.4....	7	\$-148	\$5.20	\$-26.20	272.2
200 to 300	243.8....	6	315	6.50	2.80	259.6
300 and over	350.0....	4	786	6.60	9.90	411.3
All general livestock farms	215.0....	17	\$ 235	\$6.00	\$ -6.20	300.5

GENERAL LIVESTOCK FARMS

The average labor income on general livestock farms was the lowest of any of the five farming types. It varied from \$1,500 to a minus \$1,700 with an average of \$235 for all farms.

General livestock farms received about 58 per cent of their income from the sale of livestock and livestock products. These, however, were of several different kinds. Returns and costs per animal unit consequently vary considerably, depending to a large extent upon the kind of livestock. Since it was common practice for a farm to have a mixture of several different kinds of livestock, it becomes impracticable to draw conclusions concerning the specific influence that livestock may have had on the farm income. For this reason the analysis will attempt to point out the factors responsible for variation in income that are least affected by the livestock program.

Size of farm. In most of the other types of farming, size of farm has been an important factor in explaining some of the variation in income. On general livestock farms, however, it does not appear to be so important. The data indicate that farms of 60 acres or less were just as successful as farms of over 80 acres, and farms having over 30 animal units of livestock were no more successful than those having less than 15 animal units. When size of farm is measured by productive man work units the results indicate no relationship between size and income.

Productive man work units per man. In order for the operator to receive a fair wage for his labor and management, it is necessary for him to have a full-time job and to accomplish the largest possible amount of work during the time employed. This is clearly indicated in Table 20. The farms having about 150 days of average work per man received a minus labor income of \$148. The farms accomplishing 350 days per man received \$786. The most efficient farms were considerably larger, had higher livestock returns above feed and labor costs, but had higher machine costs. The farms with less than 200 work units per man were smaller than the most efficient farms but were larger than the group having 244 work units per man.

Crop yields. The farms having less than 75 per cent of average yields received a labor income averaging \$144 (Table 21). The higher yields were accompanied by higher machine costs per crop acre, but the farms having the

Table 21. CROP INDEX AND INCOME ON 16 GENERAL LIVESTOCK FARMS
Keating Area, Baker County, Oregon, 1939

Crop index		Number of farms	Labor income	Livestock returns above feed and labor costs per productive animal unit	Machine cost per crop acre	Pro-ductive man work units per man
Group	Average					
Under 75	68.2	5	\$144	\$-11.70	\$4.70	190.5
75 to 125	104.3	8	252	3.40	6.10	231.5
125 and over	164.7	3	998	6.40	6.90	262.3

highest yields received a higher livestock return per animal unit above feed and labor costs and were more efficient in their labor program.

CROP FARMS

The crop farms have the third largest average labor income of the five types of farming. The labor income varies from \$115 to \$1,861 with an average of \$679 for the eight farms.

Size of farm. The farms having less than 150 productive man work units per farm received labor incomes averaging \$165 and capital accumulations per year averaging minus \$64 (Table 22). On the other hand, the largest farms received \$1,463 labor income and accumulated \$393 per year. The largest farms had more cropped acres, more productive livestock, a lower labor cost per crop acre, lower machine costs per crop acre, and accomplished more work per man. The smaller farms had larger yields, but this factor was not enough to offset their high labor and machine costs. Their labor income was less in total and also per acre.

Comparison of high and low income farms. The three most successful farms received labor incomes averaging \$1,247 and a capital accumulation for 8 years of \$361 per year (Table 23). The three least successful farms had labor incomes averaging \$207 and accumulated an average of \$169 per year for 18 years. The high income farms were larger, had low feed costs and low machinery costs, but had larger crop yields. They also accomplished 194 days of work per man while the low income farms accomplished 125 days of work per man.

ALL FARMS

The preceding analysis shows that size of farm, labor efficiency, crop yields, and feeding rates affect income to varying degrees, depending on the type of farming. In order to gain a general impression of the factors affecting income for the area as a whole (regardless of type of farming) the following discussion will deal with factors affecting incomes on all 61 farms.

Size of farms. In this study it was found that as the size of farm increased the income also increased. The larger farms have a better opportunity to obtain a well-balanced farm organization that can be operated with a relatively high degree of efficiency. Farm labor, the use of machinery, selection of enterprises, and the layout of fields can be carried out to a better advantage on the large farms than on the small farms.

Productive man work units are probably the best measure of size of farm since they account for both animal units and acres in crop, and places each on

Table 22. SIZE OF FARM AND INCOME ON 8 CROP FARMS
Keating Area, Baker County, Oregon, 1939

Total productive man work units per farm		Number of farms	Labor income	Crop index	Machine cost per crop acre	Acres in crop	Labor cost per crop acre	Animal units productive livestock	Capital accumulation per year
Group	Average								
Under 150	119.0.....	2	\$ 165	128.4	\$4.60	39.6	\$13.00	3.0	\$-64
150 to 350	239.6.....	4	546	110.4	3.60	82.1	11.00	10.0	208
350 and over	472.1.....	2	1,463	97.5	3.90	173.6	8.60	31.0	393
All crop farms	267.6.....	8	\$ 679	109.0	\$3.90	94.3	\$10.10	13.5	\$201

Table 23. COMPARISON OF HIGH AND LOW INCOME CROP FARMS
Keating Area, Baker County, Oregon, 1939

Item	Three high income farms	Three low income farms	All eight crop farms
Labor income	\$ 1,247	\$ 207	\$. 679
Per cent return on investment.....	7.3	-0.9	4.7
Capital accumulation per year.....	\$ 361	\$ 169	\$ 201
Total farm investment.....	\$17,171	\$ 5,947	\$11,264
Acres in crop.....	128.0	63.4	94.3
Animal units of productive livestock.....	23.6	4.5	13.5
Total productive man work units.....	365.0	179.9	267.6
Total man equivalent.....	1.88	1.44	1.69
Productive man work units per man.....	194.5	124.6	153.7
Livestock return per productive animal unit.....	\$ 58.70	\$ 67.60	\$ 58.20
Value of feed fed per productive animal unit.....	\$ 16.10	\$ 32.70	\$ 18.20
Returns per productive animal unit above feed costs	\$ 42.60	\$ 34.90	\$ 40.00
Machine cost per crop acre.....	\$ 3.90	\$ 4.60	\$ 3.90
Crop index (1938).....	104.1	102.6	109.0

a fairly comparable basis. The farms having over 1,100 productive man work units per farm received a labor income averaging \$3,186, while the smallest farms received the lowest labor income averaging \$300 per farm (Table 24).

Table 24. SIZE OF FARM AND INCOME
Keating Area, Baker County, Oregon, 1939

Total productive men work units per farm		Number of farms	Labor income	Capital accumulation per year	Animal units of productive livestock	Total farm investment	Acres in crop
Group	Average						
Under 200	154.1..	8	\$ 300	\$ 66	9.3	\$ 5,173	41.4
200 to 500	339.8..	30	380	446	40.1	13,108	88.5
500 to 800	617.8..	12	937	346	97.0	30,805	177.0
800 to 1,100	952.2..	6	1,628	1,238	288.2	59,536	366.8
1,100 and over	2,121.9..	5	3,186	924	605.8	110,243	524.3
ALL FARMS	576.5..	61	\$ 832	\$ 561	118.0	\$ 28,077	162.8

Table 25. SIZE OF FARM AND EFFICIENCY
Keating Area, Baker County, Oregon, 1939

Total productive man work units per farm		Number of farms	Crop index	Machine costs per crop acre	Productive man work units per man
Group	Average				
Under 200	154.1.....	8	115.6	\$5.70	140.9
200 to 500	339.8.....	30	105.4	5.20	216.4
500 to 800	617.8.....	12	115.4	4.10	228.5
800 to 1,100	952.2.....	6	91.2	2.60	263.5
1,100 and over	2,121.9.....	5	92.4	4.80	280.7
ALL FARMS	576.5.....	61	100.0	\$4.30	237.9

The relationship between size of farm and capital accumulation is very significant. It shows that over a long period of time the larger farms made a greater average net gain per year than the smaller farms. Although the large farms stand the chance of losing more than the smaller units in a relatively poor year, the data show that over long period of time the larger farms accumulate considerably more than the smaller farms. For the most part, this higher increase in net worth per year can be attributed to the larger amount

of capital to work with and the attainment of an efficiency of operation, which is not ordinarily possible on the smaller farms.

The smaller farms were considerably more efficient in crop production, having yields about 23 per cent higher than the larger farms (Table 25). The larger farms, however, had lower machinery and equipment costs per crop acre. The discrepancy in machine costs on the largest farms can be attributed to the type of farming in which these farms are classified. Four of the five farms are sheep ranches and machine costs are considerably higher than on other types of farming due to expenses such as sheep shearing and frequent travel between livestock on the range and the home ranch. These expenses would not be common to the other farm types.

Labor efficiency. Increases in labor efficiency are accompanied by relatively steady increases in labor income (Table 26). Farms having less than 150 productive man work units per man received labor incomes averaging \$221, while those farms having over 300 days of work per man had labor incomes of \$1,460. The former group increased their net worth \$379 per year on the average, whereas the most efficient farms accumulated \$1,218 per year.

The group of farms having an average of 259 days of work available per man had almost twice as many animal units of livestock as the most efficient farms, but the latter managed their farm business in such a manner that they received a higher labor income, and over a period of years obtained a larger increase in net worth per year.

Table 26. LABOR EFFICIENCY AND INCOME
Keating Area, Baker County, Oregon, 1939

Productive man work units per man		Number of farms	Labor income	Capital accumulation per year	Animal units of productive livestock
Group	Average				
Under 150	135.5.....	10	\$ 221	\$ 379	36.4
150-225	192.5.....	19	424	143	58.7
225-300	258.9.....	23	1,189	739	206.2
300 and over	374.3.....	9	1,460	1,218	108.5

A comparison of 10 high income and 10 low income farms. The 10 farms receiving the highest income received a labor income of \$3,206, or figured in another way, they earned 6.6 per cent on their average farm investment (Table 27). The operators of the low income farms received a minus \$568 labor income, or a loss of 1.8 per cent on their farm investment. Over a period of 22 years the high income farms accumulated on the average \$1,065 per year. The low income farms accumulated \$408 per year for 18 years. The high income farms were larger, were more efficient in their labor program, received a higher net livestock return, had higher crop yields, but lower machine costs.

Not all the difference in income can be attributed to size and efficiency. The type of farming that the individual farm in each group represents has a very definite influence on the income of these farms. The low income group consists of two beef cattle ranches, three dairy farms and five general livestock farms. The high income group is composed of five beef cattle ranches, four sheep ranches and one crop farm. As previously indicated, range livestock ranches were for the 1 year the most successful type of farming, and general livestock and dairy farms were as a whole the least successful.

Table 27. COMPARISON OF HIGH AND LOW INCOME FARMS
Keating Area, Baker County, Oregon, 1939

Item	Ten high income farms	Ten low income farms	All 61 farms
Labor income	\$ 3,206	\$ -568	\$ 332
Per cent return on investment.....	6.6	-1.8	4.1
Capital accumulation per year.....	\$ 1,065	\$ 408	\$ 561
Total farm investment.....	\$80,765	\$21,304	\$28,077
Average acres in crop.....	444.6	110.0	162.8
Animal units of productive livestock.....	414.8	63.4	118.1
Total productive man work units.....	1,400.7	426.3	576.5
Total man equivalent.....	5.37	2.10	2.42
Productive man work units per man.....	260.8	202.6	237.9
Livestock returns per productive animal units above feed and labor costs.....	\$ 9.80	\$ -5.00	\$ 5.60
Machine cost per crop acre.....	\$ 3.50	\$ 5.50	\$ 4.30
Crop index (1938).....	101.1	94.9	100.0
Years of farming experience.....	34.7	28.1	27.1
Years on this farm.....	22.1	18.1	13.5
Age of operator.....	56.0	51.0	50.0
Operator's education (years).....	10.8	8.8	9.7

Personal data concerning the operator show that the operators on the high income farms had attended school for almost 11 years, had about 35 years of farming experience, and were approximately 56 years old. The operators of the low income farms had fewer years of education and farming experience, and were younger by 5 years.

PRESENT ECONOMIC STATUS

In the preceding analysis all farms have been considered from a basis that lends itself to comparing one farm with another or one group of farms with another group. This procedure assumes that all farms are free of debt, that all land operated on each farm is owned by the operator, and that all taxes have been paid. Of course this situation is unreal. Most of the farms do have debts of one kind or another, many farms have rented land, and a few farms have delinquent taxes.

The 61 operators included in this area, according to their own estimates, had an average total farm capital or investment of \$28,077. Of this amount, \$7,372 were liabilities of the operator in the form of real estate mortgages, short-term credit, delinquent taxes, and unpaid interest. In addition to the liabilities, \$3,721 of the total average capital is the value of rented property. The average operator's equity per farm is \$16,984 after all deductions for liabilities and the value of rented property have been made.

THE CREDIT SITUATION

Mortgage indebtedness. Of the 61 farms in the Keating Area, 45 were mortgaged by 63 individual loans. Of the 63 loans made, 28 were made by the Federal Land Bank and 6 by the Land Bank Commissioner. Federal Land Bank and Commissioner loans constituted 78 per cent of the total amount of outstanding mortgages. The remaining 29 mortgages were held by private individuals and institutions and the State Land Board. These loans accounted for the remaining 22 per cent of mortgage indebtedness.

The degree of indebtedness naturally varies a great deal between individual farms, some farms have no mortgage outstanding, while on other farms the

Table 28. REAL ESTATE MORTGAGE INDEBTEDNESS ON MORTGAGED FARMS BY TYPE OF FARMING
Keating Area, Baker County, Oregon, 1939

Type of farming	Number of farms mortgaged	Original amount outstanding	Present amount outstanding	Age of present mortgage (years)*	Per cent paid off	Fiscal year's payments		Rate of interest paid	Per cent principal paid off each year
						Principal	Interest		
Beef cattle	13	\$10,550	\$ 9,201	5.4	12.8	\$293	\$ 460	4.9	2.4
Sheep	5	29,700	25,777	9.6	13.2	912	1,183	4.4	4.6
Dairy	8	2,835	1,828	7.7	35.5	94	92	4.8	1.4
General livestock	13	4,410	4,020	6.1	8.8	247	194	4.6	1.4
Crop	6	3,342	2,865	9.9	14.2	98	150	5.1	1.4
ALL FARMS	45	\$ 8,527	\$7,391	7.2	13.3	\$287	\$ 357	4.6	1.8

* Represents the average number of years the present mortgage has been outstanding.

mortgage indebtedness amounts to more than the operator's equity. Considering the area as a whole, the total mortgage indebtedness on real estate owned by the operators represents 36.8 per cent of the total value of this property.

The average amount of loans outstanding per mortgaged farm varied from \$1,828 on dairy farms to \$25,777 on sheep ranches with an average of \$7,391 for all farms actually mortgaged. (Table 28.) The original amount of the mortgage indebtedness on all 61 farms (unmortgaged farms included) was \$6,290, part of which has been paid, the present amount outstanding being \$5,452 per farm.

The weighted average rate of interest on real estate mortgages was 4.6 per cent. The Federal Land Bank and Land Bank Commissioner loans received 3½ and 4 per cent respectively, while the private mortgagees, State Land Board, and banks received from 4 to 8 per cent.

The age of the individual mortgages ranged from less than 1 year to more than 20 years with an average of 7 years.

The percentage of the original amount of the mortgages that has been paid off varies from 8.8 per cent on the general livestock farms to 35.5 per cent on dairy farms with an average of 13.3 per cent for all farms. Thus on the average 1.8 per cent of the original amounts of the present mortgages has been paid off each year during the 7 years that the mortgages have been outstanding. During the year covered by this study, the operators paid off 3.3 per cent of their original principal. Since most of the mortgages are Farm Credit Administration loans that operate on an amortization basis, the amount of the yearly installment, which is applied on the principal becomes larger each year and conversely the amount paid as interest becomes less.

The delinquency in principal and/or interest payments amounted to 9.5 per cent of the number of loans outstanding or 3.5 per cent of the total amount outstanding.

The ability of the operator to repay his debts depends a great deal upon the size of farm, the volume of business, gross receipts, the efficiency of operation, and his general attitude toward debt repayment. In order to have a good debt carrying capacity an operator should have a business large enough to permit efficient operation and to provide a gross income that will pay all farm and living expenses and all interest charges and principal payments on his indebtedness.

The data indicate that on the average, after all the operator's farm expenses had been met, he had \$1,797, farm-furnished living not included, with which to pay living expenses and interest and principal payments on his indebtedness. The size of farm, efficiency of operation, and income for the present year indicate that the repayment capacity appears to be satisfactory. Crop yields, range conditions, and changes in prices received by farmers may considerably modify the farm income and for this reason one year's income is not entirely sufficient to measure an area's loan repayment ability.

Short-term credit. Short-term credit is extended in the form of loans that are to be repaid within a relatively short period of time—usually within a year. The credit is normally used to pay current farm operating expenses and for purchasing livestock and farm equipment. Chattel mortgages on crops, livestock, and equipment represent the usual type of security.

Short-term credit consisted of 48 loans on 46 of the farms. Bank loans were largest in number, but ranked second in importance with respect to total year-dollars of credit* (Table 29). Production Credit Association loans ac-

* See page 54, Appendix, for explanation of terms.

Table 29. SHORT-TERM CREDIT BY SOURCE OF CREDIT
Keating Area, Baker County, Oregon, 1939

Source of credit	Number of loans	Year-dollars per loan	Interest per loan	Rate of interest
Baker Production Credit Association*..	17	\$4,724	\$251	<i>Per cent</i> 5.0
Bank	19	850	52	6.1
Other†	12	832	45	5.4
TOTAL LOANS	48	\$2,217	.....	.....

* P.C.A. borrowers paid on the average \$12 per loan for inspection charges. This amounts to .26 per cent of the total year-dollars of P.C.A. credit. These borrowers also must own stock in the P.C.A. The amount of interest and the rate of interest is, therefore, no comparable to the other rates quoted.

† Includes private, F.S.A., etc.

counted for 75 per cent of the total year-dollars of credit, bank loans accounted for 15 per cent, and other loans 10 per cent. Over half the Production Credit Association loans were on beef cattle and sheep ranches. Ten of the 19 bank loans were on beef cattle ranches.

Table 30. YEAR-DOLLARS OF SHORT-TERM CREDIT AND INTEREST PAID PER FARM BY TYPE OF FARMING
Keating Area, Baker County, Oregon, 1939

Type of farming	Number of farms	Year-dollars credit	Interest per farm	Rate of interest
Beef cattle	16	\$ 1,566	\$ 88	<i>Per cent</i> 5.6
Sheep	6	11,035	559	5.1
Dairy	14	524	27	5.2
General livestock	17	274	15	5.3
Crop	8	397	20	5.2
ALL FARMS	61	\$ 1,745	.....	.....

The total year-dollars per farm varied from \$11,035 on sheep ranches to \$274 on general livestock farms. The average for all farms was \$1,745 (Table 30). It must be remembered that the rates of interest do not account for inspection charges and the cost of owning stock in connection with Production Credit Association loans.

LAND TENURE

Thirty-one of the 61 operators studied in this area rent land. Of these 31, 7 rent all the land they operate, and 24 rent land in addition to the land they own.

Approximately 37 per cent of all the range land operated (not including publicly owned land), about 26 per cent of the noncropland pasture and about 18 per cent of the cropland are rented. In terms of acres these percentages represent 36,825 acres of grazing land, 310 acres of noncropland pasture, and 2,106 acres of cropland.

Although over a third of all the acres operated is rented, the value of these acres amounts to only 13 per cent of the total property valuation of the area. The high percentage of range land with its relatively low valuation per acre accounts for this apparent discrepancy. When measured by value, the largest

percentage of the rented property is operated by beef cattle ranches. These outfits lease about 47 per cent of all rented land.

Nine of the 31 renters had crop share leases while the remaining 22 paid cash rent. The operators renting on the share basis usually paid one-half the hay and one-third the grain produced on the rented property. The landlord would pay the taxes and water charges and in some cases would furnish some of the seed.

Most of the grazing land rents for cash, but in a few cases the renter pays the taxes on the property or makes fence improvements for his rental fee. The grazing land rented for 5 to 15 cents per acre with an average of about 9 cents.

On the basis of the valuation placed on the rented property by the renters, the landlords received \$5.50 rent per \$100 valuation of the rented property. In turn the landlords paid about \$1.57 taxes per \$100 valuation. This would leave the landlord almost \$4.00 (for every \$100 worth of property he rents), to pay other expenses he incurs in operating the land and to pay interest on investment.

TAXATION

No attempt was made in the field work to ascertain the degree of tax delinquency. In the Keating Area the taxes payable in 1939 were 14.2 per cent higher than the taxes payable in 1938. Figures for all of Baker County indicate that taxes payable in 1939 were 15.3 per cent higher than those of 1938. This suggests that the increase in tax assessments in the Keating Area is quite comparable to the increase for the county as a whole.

CAPITAL ACCUMULATION

Capital accumulation per year is undoubtedly one of the best measures of the long time economic progress of an area. It shows the average annual increase in operator's net worth for the length of time the operator has been on the present farm.

Capital accumulation varied from \$868 per year on sheep ranches to \$201 on crop farms with an average for all farms of \$561 per year (Table 31). This average means that the operators increased their net worth \$561 per year for an average of 13 years after paying all farm expenses, all living expenses, all interest and principal payments on indebtedness and any personal contributions.

Table 31. FINANCIAL PROGRESS BY TYPE OF FARMING
Keating Area, Baker County, Oregon, 1939

Type of farming	Net worth			Capital accumulation		Per cent capital accumulation per year is of original net worth
	Original	Present	Total	Per year	Years	
Beef cattle	\$15,514	\$30,756	\$15,242	\$721	18	4.6
Sheep	35,600	52,520	16,920	868	20	2.4
Dairy	3,406	7,794	4,388	426	10	12.5
General livestock..	2,910	6,221	3,311	350	9	12.0
Crop	3,534	6,402	2,818	201	12	5.6
ALL FARMS	\$10,129	\$18,153	\$ 8,024	\$561	13	5.5

The two types of range livestock ranches had a considerably higher capital accumulation per farm and also per year, but it must be remembered that they were also much larger than the dairy, general livestock, and crop farms, and therefore had a better opportunity to accumulate larger amounts. The sheep and cattle ranches accumulated 2.4 per cent and 4.6 per cent per year respectively of their original net worths. Other farm types accumulated 5.6 per cent to 12.5 per cent per year of their original net worth. This indicates that on the average the dairy, general livestock, and crop farms though not accumulating as much per farm or per year were just as successful in relation to their original investment or net worth as were the sheep and cattle ranches.

The average net worth of the operator when he moved onto his present farm varied from over \$35,000 on sheep ranches to less than \$3,000 on general livestock farms, with an average of \$10,129 for all farms. The operator's net worth when he moved onto his present farm (including down payment on purchase price, equipment, livestock, and other assets) represents about 42 per cent of the present value of the operator's holdings. The average down payment per farm, \$3,657, accounted for about 50 per cent of the purchase price.

CONCLUSIONS

Farming in this area appears to be founded on a sound basis insofar as income is concerned. As might be expected, there were some individual farm operators who incurred losses during the year of this study, while many others received relatively high incomes.

During the year June 1, 1938 to May 31, 1939, the farmers received an average return of 4 per cent on their investment and \$832 for their labor and management. Also over a long period of time, representing a total of some 800 man-years of farm experience, these operators increased their net worth on the average by \$561 per year.

About 20 per cent of the farms are too small to produce a satisfactory income under present methods of farming. Since practically all irrigable land is now in cultivation, increases in the size of these smaller units, in terms of acres, can only be obtained through subdivision of larger farms or through consolidation of small farms.

Other alternatives for increasing income are available and are more practical. Increasing the number and quality of dairy cows would be desirable for many of the smaller farms, especially those selling surplus hay. Obtaining higher quality cows would definitely increase the gross income. As the situation exists, the dairy cows in the Keating Area are inferior in butterfat production. During the year of this study they produced on the average only slightly more than 200 pounds of butterfat per cow, whereas the state average was 236 pounds. If rigid culling and purchasing, or raising of good quality replacements were practiced, there is no apparent reason why the production per cow could not be raised with little if any additional expense to the operator.

Management is just as important in many respects as size of farm. This is especially true in the case of beef cattle ranches. The more successful cattle ranches were operated under a plan of rigid economy. They had much lower expenses but received almost average gross receipts per animal unit. The low expense per animal unit was effected by economical feed and labor programs and low land charges.

The cost of labor, including the amount allowed the unpaid family and the operator, is one of the largest expenses. It averages over \$1,800 per farm for

the Keating Area. On many farms economies in the use of labor can be accomplished. A change in farm enterprises that will permit a better distribution of labor throughout the year, the use of labor-saving machinery, better field arrangement, and a careful supervision of hired help may warrant considerable thought on the part of the operator.

Crop yields and machine costs are important factors affecting farm income. Some farms receive high crop yields and yet have relatively low machine costs. In fact this situation occurs on the more successful farms on all types of farming. Crop yields on the individual farm undoubtedly are influenced by physical factors such as soils and irrigation water supply. Crop yields are also affected by the operator's methods of tillage, seeding, irrigating, and harvesting the crop.

Machine costs per farm including interest and depreciation average almost \$700, and it is entirely possible that this sum can be reduced. On many farms the machinery investment and costs are too large to give adequate returns and are a definite financial burden on the operator. If a more efficient and economical use of machinery is obtained, it will not necessarily mean a reduction of yields, for as previously stated, the more successful farms have relatively high yields with low machine costs.

One of the most serious problems in the area is the rapidly spreading infestation of whitetop. Unless the spread of this weed is controlled it is very likely that the productivity of much of the cropland will be seriously affected. Its control is for the most part beyond the resources of the individual farmer. Consequently, it appears that cooperative action of all farmers in the area with aid from local, state, or Federal governments will be required.

The Sparta Area

FARM ORGANIZATION

Farming in the Sparta Area is different in many respects from that in the Keating Area only a few miles away. The Sparta farms are dry-farmed, small units (Table 41, Appendix), have very few range livestock, and received a very low net income for the year of this study.

TYPES OF FARMING

The 19 farms included in the survey were classified according to the major source of income. In this way, 7 of the 19 farms were classed as dairy farms, 6 as general livestock farms, 5 as crop farms, and 1 as a beef cattle ranch.

LAND USE

Range land comprises about 80 per cent of the total acreage in the 19 farms, and cropland almost 20 per cent (Table 42, Appendix). Of the total cropland, about 77 per cent is in crop, 16 per cent in summer fallow, and 7 per cent in pasture.

CROPPING SYSTEM

Alfalfa hay and grain hay account for almost 50 per cent of the total acres in crop (Table 32). A seed crop together with one cutting of hay is harvested from about a fourth of the alfalfa acreage. Most of this seed is of the Ladak variety and a large portion is certified.

Table 32. UTILIZATION OF LAND IN CROPS
Sparta Area, Baker County, Oregon, 1939

Crop	Acres per farm	Per cent of total
<i>Hay</i>		
Alfalfa hay	27.4	38.3
Grain hay	8.1	11.3
TOTAL HAY	35.5	49.6
<i>Grain</i>		
Wheat	14.7	20.6
Barley	5.0	7.0
Miscellaneous grain	6.8	9.5
TOTAL GRAIN	26.5	37.1
<i>Miscellaneous</i>		
New seedings	6.0	8.4
Garden	0.9	1.3
Other	2.6	3.6
TOTAL MISCELLANEOUS	9.5	13.3
TOTAL	71.5	100.0

Grain accounts for about 37 per cent of the crop acres. Most of the grain acreage is in wheat with the balance in oats, barley, and rye. Miscellaneous crops consist of new seedings of alfalfa and crested wheat grass, corn, crested wheat grass seed, and the family garden.

As a whole the crop yields received in 1938 compared quite favorably with those "usually" received (Table 33). According to the farmers, 1938 yields were about 91 per cent of "usual."

Table 33. 1938 AND "USUAL" CROP YIELDS
Sparta Area, Baker County, Oregon, 1939

Crop	Yield		Per cent 1938 yield is of "usual" yield
	1938	"Usual"	
Wheat (winter)— <i>Bushels</i>	27.0	25.6	105.4
Wheat (spring)— <i>Bushels</i>	18.7	18.5	101.1
Oats— <i>Bushels</i>	28.5	31.8	89.7
Barley— <i>Bushels</i>	16.9	24.7	68.5
Corn— <i>Bushels</i>	15.5	18.5	84.1
Alfalfa hay (1 cutting)— <i>Tons</i>	1.0	1.1	95.1
Rye hay— <i>Tons</i>	1.3	1.3	100.0
Alfalfa seed— <i>Pounds</i>	30.6	43.9	69.7
TOTAL .....	.....	.....	91.0

Most crops and livestock are marketed outside the area. "Outside" purchases of feed crops is practically nil amounting to only 14 bushels of wheat for the entire area, whereas "outside" sales consisted of almost 2,000 bushels of grain and several thousand pounds of alfalfa and crested wheat grass seed. The small seed crops are sold in Baker, while most of the grain is sold to farmers in nearby farming communities.

THE LIVESTOCK PROGRAM

The number of livestock per farm varies from 5 to about 60 animal units, with an average of about 20 for all farms. Dairy cattle are the most important class of livestock, accounting for over 34 per cent of the total animal units. Other livestock consisting of hogs, poultry, sheep, and young horses amounts to 20 per cent. Workstock, although they do not in themselves contribute income directly, constitute 33 per cent of the total animal units. Beef cattle occur on only one farm and none of the operators have range sheep. The livestock receipts are mainly derived from the sale of butterfat, hogs, and poultry products.

DISTRIBUTION OF INVESTMENT

The average investment is shown in Table 34. Land is the largest item, but all are relatively small especially when compared with the Keating Area.

Table 34. TOTAL FARM INVESTMENT
Sparta Area, Baker County, Oregon, 1939

Item	Investment per farm*	Per cent of total
Buildings	\$ 710	12.5
Land	3,231	56.7
Livestock	1,034	18.2
Machinery and equipment	644	11.3
Miscellaneous	77	1.3
TOTAL	\$5,696	100.0

* As of June 1, 1938.

FINANCIAL SUMMARY

Receipts and expenses. Most of the area's income is derived from the sale of livestock and livestock products (Table 35). This source of income accounted for about 52 per cent of the total farm receipts. Crop sales and miscellaneous receipts are next in importance. A.A.A. payments amounting to \$88 per farm represent about 8 per cent of the total receipts.

Miscellaneous farm receipts is an important source of cash income to these farmers. It is composed of off-farm labor that accounts for 33 per cent of the \$114; sale of cordwood and posts, 32 per cent; rent of range land, 12 per cent; and other items, 23 per cent. If these sources of income were not available there would be very little if any cash available for family living expenses and debt repayments.

The total expenses per farm varied from \$79 to \$3,000 with an average for all farms of \$881. Machinery and equipment purchases and their operating expenses accounted for almost 35 per cent of the total farm expense. Labor costs, including the value of all hired labor and board as well as unpaid labor of members of the family, amounted to about 22 per cent of the expenses.

Net income. As a whole the net income for these farms is low. The average net family farm earnings is only \$656 per farm (Table 36). This is the amount, including the value of farm-furnished living, that is available for family living, for interest on investment, and for wages of the operator and unpaid members of his family.* These farms lacked \$34 of making 4 per cent on the investment, with nothing allowed for the labor of the operator. Or if we allow a fair wage for the operator, he lost 5.7 per cent on his investment.

Table 35. FARM RECEIPTS AND EXPENSES
Sparta Area, Baker County, Oregon, 1939

Item	Average per farm
Number of farms	19
<i>Receipts</i>	
Crops	\$ 224
Livestock	407
Livestock products	154
AAA payments	88
Miscellaneous	114
TOTAL CASH RECEIPTS	\$ 987
Inventory increase	90
TOTAL FARM RECEIPTS	\$1,077
<i>Expenses</i>	
Labor and board	\$ 76
Crop purchases	71
Livestock purchases	81
Machinery and equipment	305
Buildings and improvements.....	18
Property taxes	49
General operating expenses	123
TOTAL CASH EXPENSES	\$ 723
Unpaid farm labor (does not include the operator).....	158
TOTAL FARM EXPENSES	\$ 881

* The figure is derived by subtracting all farm expenses not including mortgage interest or unpaid family labor, from total farm receipts and adding the value of farm-furnished living.

Table 36. FINANCIAL SUMMARY
Sparta Area, Baker County, Oregon, 1939

Item	Amount
Net farm income (receipts minus expenses).....	\$ 196
Farm-furnished living	302
Unpaid family labor	158
NET FAMILY FARM EARNINGS.....	\$ 656
Net farm income	\$196
Less interest on farm investment at 4 per cent.....	230
OPERATOR'S LABOR INCOME	-34
Net farm income	\$196
Less value of operator's time.....	521
RETURN ON TOTAL FARM INVESTMENT.....	-325
PER CENT RETURN ON FARM INVESTMENT (divide return on invest- ment by total farm investment).....	-5.7
TOTAL FARM INVESTMENT*.....	\$5,741

* Average of inventory values at beginning and end of year.

If these farmers did not have their farm privileges or farm-furnished living to supplement their cash income, it is very doubtful if these farm units could support a family. The value of farm-furnished living as just mentioned averaged \$302 per farm. It consists of garden products, \$83; dairy products, \$63; eggs, \$29; livestock, \$48; wood, \$41; and 10 per cent of the value of the family dwelling, which amounts to \$38.

REPRESENTATIVENESS OF DATA

If crop yields and prices received by farmers are indications of the typicalness of the income received in any one year, then there is little doubt that the year of this study is not representative. Crop yields were somewhat below normal, averaging about 91 per cent of usual yields. Prices received by farmers during the year of this study were considerably lower than those received during the years 1926-1935 (Table 9). Prices for wheat and butterfat were especially low, and these two commodities are the main sources of income in the Sparta Area.

PRESENT ECONOMIC STATUS

THE CREDIT SITUATION

The total indebtedness per farm averaged \$629 and consisted of real estate mortgages, short-term credit, delinquent taxes, and delinquent interest.

Mortgage indebtedness consists of 9 individual mortgages on 8 of the 19 farms. The amount outstanding as of May 31, 1939 averaged \$1,385 per mortgaged farm and had been outstanding for an average of 6 years. During this period, 37 per cent of the original amount of the loan had been paid. The year of this study, the eight mortgaged operators paid on the average \$116 on the principal and \$88 on the interest. The interest rate averaged 5.9 per cent on these mortgages.

Only 6 of the 19 operators used short-term credit. The loans when converted to a full 12 months basis averaged \$41 for the 19 farms. The interest rate averaged about 7 per cent.

LAND TENURE

Tenancy in this area occurs in about the same proportion as in the Keating Area. Of the 19 operators studied, 2 are tenants leasing all the land they operate, and 5 rent or lease property in addition to owning land.

Approximately 39 per cent of all range land operated and about 7 per cent of the cropland is rented. Altogether, 38 per cent of the total acreage operated is rented.

The 4 operators renting cropland on the share basis paid the landlord $\frac{1}{2}$ the hay and $\frac{1}{3}$ to $\frac{1}{4}$ the grain. Practically all of the range land was rented or leased for cash, most of it leasing for about 8 cents per acre.

CONCLUSIONS

With possibly one or two exceptions, all farms in the Sparta Area are too small to return the operator a fair wage for his labor and a fair return on the farm investment. A farm should be at least large enough to offer full-time work to the operator and his family. In the Sparta Area, each man working on the farm accomplished only about 122 days of productive work during the year. These 122 days of work are composed not only of farm work, but include off-farm labor spent in cutting wood, working on roads, and other nonfarm jobs. Opportunities for off-farm work are rather limited. If there were a larger supply available, there is no doubt that these farm families would take advantage of it.

An average of 72 acres of dry-farmed land with the kind of crops grown and the yields received in this area, even when combined with about 13 animal units of productive livestock, returns an income that is obviously insufficient to provide a reasonable standard of living. Increasing the size of farm by an intensive agriculture does not seem suitable because of the necessity of dry-farming. Also the tillable land is almost completely utilized, precluding any possibility for increased acreage.

The area does have some characteristics that partly compensate for the low income. It is rather isolated and consequently personal living expenses, with respect to amusement and recreational items, are much lower than in farming communities less isolated. The families tend also to live as much as possible on farm produced foods. One of the farmers made this statement, "If we didn't have our garden and our butter, milk, and eggs, I don't believe we could stay here very long."

Possibilities for increases in the area's income are strictly limited. However, if there should be any improvement, it will almost necessarily result from adjustments in the relationship existing between the amount of available farm work and the number of farm workers.

Appendix

EXPLANATION OF TERMS

Total farm investment is the average of the beginning and ending inventories and represents the value of all land, buildings, and improvements, livestock, machinery and equipment, feeds, farm supplies, and cash required to operate the farm business. This figure includes the total value of all farm property owned, leased, or rented by the operator, and does not include any deduction for indebtedness.

Productive man work unit is the average amount of work accomplished by one man in a day at usual farm tasks and under average conditions. The average labor requirements for various crops and various kinds of livestock have been determined by a long series of farm management studies. For example, a dairy cow in eastern Oregon ordinarily requires 12 days of man labor per year while about two days of man labor are required to grow and harvest an acre of irrigated wheat. If for a certain farm we know the number of acres of different crops and the numbers of different kinds of livestock, we can calculate the number of productive man work units that would be required to operate the farm. The actual amount of work expended on this particular farm, however, may be larger or smaller than this calculated amount, depending upon the efficiency with which the work was done.

Man equivalent is the sum of the total labor that was required to accomplish the work on the farm (or farms) reduced to the equivalent of yearly full-time workers. In this study, the entire time of the operator is charged against the farm.

Productive man work units per man are the number of average days work to be done on the farm by each man in a year. It is determined by dividing the total "productive man work units" by the "man equivalent." The number of productive man work units per man, therefore, indicates at least in a general way the accomplishments of the available labor.

Animal unit is 1 cow, 5 mature sheep, 100 hens, or their equivalent in other livestock including workstock. An *animal unit of productive livestock* does not include workstock. A *cattle unit* is an animal unit of productive livestock on a beef cattle ranch. A *sheep unit* is $\frac{1}{5}$ of an animal unit of productive livestock on a sheep ranch.

Livestock returns is the value of the net increase in livestock during the year. It is obtained by subtracting the sum of the value of livestock at the beginning of the year plus the cost of livestock purchased from the sum of the value of livestock at the end of the year plus the receipts from livestock and livestock products sold.

Crop index is a measure of the physical productivity of the farm. The crop index on one farm or group of farms is expressed as a percentage of the average yields of the area. If the crop index is 120 for one farm, this would indicate that its yields are 20 per cent above the average yields for the area.

Machine cost is the total of all cash and noncash expenses incurred in the use of farm machinery and equipment. It consists of machinery and equipment operating expenses, depreciation, machine work hired, and interest on the current value of machinery at 4 per cent.

Table 39. FINANCIAL SUMMARY BY TYPES OF FARMING
Keating Area, Baker County, Oregon, 1939

Item	Type of farming										All farms	
	Beef cattle		Sheep		Dairy cattle		General livestock		Crop			
	Average	Per cent of total	Average	Per cent of total	Average	Per cent of total	Average	Per cent of total	Average	Per cent of total	Average	Per cent of total
Number of farms	16	.....	6	.....	14	.....	17	.....	8	.....	61	.....
<i>Farm receipts:</i>												
Crops sold	\$ 653	7.5	\$ 168	0.8	\$ 362	13.3	\$ 419	21.0	\$1,279	50.0	\$ 556	9.5
Livestock sold	6,789	77.8	13,114	63.4	749	27.6	794	39.8	364	14.2	3,512	60.1
Livestock products sold	375	4.3	6,467	31.3	633	23.3	369	18.5	251	9.8	1,015	17.4
AAA payments	293	3.4	517	2.5	83	3.1	67	3.4	66	2.6	174	3.0
Miscellaneous	271	2.9	130	0.7	56	2.0	113	5.7	115	4.5	144	2.5
TOTAL CASH RECEIPTS	\$8,381	95.9	\$20,396	98.7	\$1,883	69.3	\$1,762	88.4	\$2,075	81.1	\$5,401	92.5
Inventory increase	356	4.1	277	1.3	834	30.7	233	11.6	485	18.9	440	7.5
TOTAL FARM RECEIPTS	\$8,737	100.0	\$20,673	100.0	\$2,717	100.0	\$1,995	100.0	\$2,560	100.0	\$5,841	100.0
<i>Farm expenses:</i>												
Labor and board	\$1,043	18.4	\$ 3,870	26.9	\$ 132	7.2	\$ 48	3.6	\$ 186	13.0	\$ 722	18.6
Crop purchases	256	4.5	1,369	9.5	158	8.6	94	7.0	50	3.5	271	7.0
Livestock purchases	1,621	28.6	3,740	26.0	432	23.4	247	18.4	287	20.1	999	25.7
Machinery and equipment	1,007	17.7	1,357	9.4	482	26.2	321	23.8	341	23.8	643	16.5
Buildings and improvements..	196	3.5	662	4.6	57	3.1	50	3.7	8	0.6	144	3.7
General	1,026	18.3	2,925	20.3	419	22.6	393	29.4	390	27.3	814	21.0
TOTAL CASH EXPENSES	\$5,149	91.0	\$13,923	96.7	\$1,680	91.1	\$1,153	85.9	\$1,262	88.3	\$3,593	92.5
Unpaid family labor	511	9.0	470	3.3	164	8.9	190	14.1	168	11.7	293	7.5
TOTAL FARM EXPENSES	\$5,660	100.0	\$14,393	100.0	\$1,844	100.0	\$1,343	100.0	\$1,430	100.0	\$3,886	100.0
NET FARM INCOME	\$3,077	.....	\$ 6,280	.....	\$ 873	.....	\$ 652	.....	\$1,130	.....	\$1,955	.....

Table 40. DISTRIBUTION OF INVESTMENT ON 16 BEEF CATTLE AND 6 SHEEP RANCHES
Keating Area, Baker County, Oregon, 1939

Item	16 beef cattle ranches		6 sheep ranches		Productive animal unit (5 sheep)
	Investment per		Investment per		
	Ranch	Cattle unit†	Ranch	Sheep unit	
Land	\$27,757	\$136.40	\$49,220	\$19.90	\$ 99.70
Buildings	4,217	20.70	7,175	2.90	14.50
Equipment	2,124	10.50	4,024	1.60	8.10
Work stock	698	3.40	1,131	.50	2.30
Productive livestock	11,027	54.20	19,914	8.10	40.30
Operating cash	211	1.00	800	.30	1.60
Miscellaneous	266	1.30	404	.20	.80
TOTAL INVESTMENT* ..	\$46,300	\$227.50	\$82,668	\$33.50	\$167.30
Total receipts (including inventory charges)	<i>Receipts</i>		<i>Receipts</i>		
Receipts per \$100 of investment	\$ 8,737	.....	\$20,673	.....	.....
	18.90	.....	25	.....	.....

* As of June 1, 1938.

† A cattle unit is comparable to a productive animal unit.

Table 41. RANGES IN SIZE OF FARMS AND AVERAGE SIZE OF FARM BY DIFFERENT MEASURES OF SIZE
Sparta Area, Baker County, Oregon, 1939

Measure	Number of farms	Range		Average
		Low	High	
Total productive man work units.....	19	39.4	366.5	175.2
Man equivalent	19	1.0	4.1	1.4
Acres in crop	19	24.3	156.0	71.5
Total investment	19	\$1,329.	\$10,742.	\$5,741.
Total animal units.....	19	5.0	57.8	20.1

Table 42. UTILIZATION OF PRIVATELY OWNED LAND
Sparta Area, Baker County, Oregon, 1939

Land use	Total acres	Acres per farm	Per cent of total acres
In crop	1,358.5	71.5	15.0
Idle or fallow	289.8	15.2	3.2
Cropland pasture	124.0	6.5	1.4
TOTAL CROPLAND*	1,772.3	93.2	19.6
Farmstead	63.5	3.3	0.7
Private range land†	7,231.2	380.7	79.7
TOTAL	9,067.0	477.2	100.0

* Three per cent or 53.5 acres of the total cropland is irrigated.

† Includes no publicly owned grazing land used under a Grazing Service Allotment or a Forest Service Permit.