AGRICULTURAL EXPERIMENT STATION
Oregon State College, Corvallis
Wm. A. Schoenfeld, Director
and
Soil Conservation Service and
Bureau of Agricultural Economics
United States Department of Agriculture
Cooperating

Station Circular of
Information No. 250.

July, 1941

Progress Report
FARM ORGANIZATION STUDY
LOWER POWDER RIVER VALLEY - BAKER COUNTY, OREGON, 1939
Keating and Sparta Areas

by

D. Curtis Mumford and George B. Davis

DESCRIPTION OF THE AREA

Location

The area in which this study was made is located in the Blue Mountain Region of Northeastern Oregon, in that portion of North Central Baker and South Central Union Counties which forms the Lower Powder River watershed. The part lying in Union County includes no farming land and is a section of the Whiteman National Forest.

The agriculture of this region can be divided into two distinct farming districts or areas; namely, the Keating and the Sparta Areas. 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 foothill region located east of the Keating Area and at an altitude of several hundred more feet.

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 over 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 one to about three miles, while the valleys formed by the tributary streams are much narrower, but are sufficiently flat to permit farming.

FOREWORD

In the summer of 1939 at the suggestion of the Baker County Land Use Planning Committee, an economic study of farm organization was made by the Agricultural Experiment Station, Oregon State College, with the Soil Conservation Service, and the Bureau of Agricultural Economics, United States Department of Agriculture, cooperating.

The field data were procured by use of the survey method. A total of 61 records were obtained in the Keating Area and 19 in the Sparta Area. This represents approximately 80 per cent of the total number of farms and ranches in the two areas.

Each of the 80 cooperators in this study has received a summary of his year's farm business. These summaries were returned to the individual cooperators at meetings held in the Keating Area during the early part of June, 1941.

The tables and comments in this progress report are intended to give the reader a brief summary of the "overall" picture of the land use, crop and livestock programs, types of farming, sizes of farms, and farm incomes which occurred in this area during the year June 1, 1938 to May 31, 1939. These results have been prepared by the Department of Farm Management, Oregon State College, and later will be incorporated in a detailed analysis and discussion for publication as an Agricultural Experiment Station Bulletin.

Explanation of Terms. Explanations of some of the terms used in this report will be found on pages 30 and 31.

ACKNOWLEDGMENTS

The authors wish to thank the eighty farmers and ranchers for their time and effort in making the basic data available. Acknowledgments are also due 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 his aid in summarizing the data; Professor E. L. Potter, Chief of the Division of Agricultural Economics, Oregon State College, for assistance in the preparation of this report; and P. T. Fortner, County Agricultural Agent of Baker County, for his advice and help in contacting the cooperators.

TABLE OF CONTENTS

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.

Soils

The soils of the area may be roughly divided into three groups: valley soils, hill soils adjacent to the Keating Area, and hill soils in the Sparta Area.

The valley soils are of alluvial origin and vary in texture from sandy loams to clay loams. A considerable accumulation of alkali is present in these soils as a result of the overtaxing of the natural drainage system by irrigation. Unless better drainage facilities are made available, there is some likelihood that a serious alkali problem may arise.

The soils on the cultivated hill or bench land adjacent to the main valley are also alluvial. Drainage and alkali, however, offer no problems here, because there is no irrigation, 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

The region is semi-arid 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 variation of 41 degrees Fahrenheit between the means of the coldest and warmest months. The mean annual temperature (48-year average) is 45.3 degrees.

The Agriculture

The agriculture of the Keating Area is essentially based on a livestock economy with beef cattle and range sheep predominating. Other kinds of livestock such as dairy cattle, hogs, and farm sheep, however, are common on most farms. The range livestock enterprises are dependent upon winter feed produced on irrigated farm land and upon spring, summer, and fall grazing on private and publicly owned range land and the national forest.

The cropland is almost entirely devoted to the production of hay, grain, and pasture. These products are for the most part consumed by local livestock.

General farming characterizes the dry-farmed Sparta Area. Here range livestock are of little importance. Dairy cattle are the most common kind of livestock and account for the largest percentage of the total animal units.

The Keating and the Sparta farming areas are two distinctly different farming areas, not only in topography, soils, kinds of livestock, and cropping systems, but also different from the standpoint of size and number 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.

It is hoped that this procedure will tend to bring out the problems peculiar to each area and give a better picture of the farming systems in these areas as they exist at the present time.

SECTION I

The Keating Area

TABLE 1. UTILIZATION OF PRIVATELY OWNED LAND

Keating Area - 61 farms - 1939

Land use	Total acres	Per cent of total
In crop	9,932	9.0
Idle or fallow	490	0.4
Cropland pasture	1,465	1.3
TOTAL CROPLAND	11,887	10.8
Permanent non-plowable pasture	1,179	1.0
Farmstead, roads, and waste	340	0.3
Private rangeland	97,683	87.9
TOTAL ACRES	111,089	100.0

Grazing represents the most important use made of the land in this area since 90 per cent of the area is non-tillable. Private grazing land consists mostly of what is known as sagebrush type, but includes also some privately owned timberland used for grazing. In addition to the private rangeland, 37 operators have Grazing Service Allotments and 16 have Forest Service Permits for their range cattle and sheep.

TABLE 2. UTILIZATION OF LAND IN CROPS

Keating Area - 61 farms - 1939

Crop	Acres in crop		Per cent of total
	Total	Per farm	
Hay:			
Alfalfa hay	5,034	82	50.7
Wild hay	1,492	25	15.0
Other hay	806	13	8.1
Total hay	7,332	120	73.8
Grain:			
Barley	694	12	7.0
Oats	624	10	6.3
Wheat	452	7	4.5
Other grain	187	3	1.9
Total grain	1,957	32	19.7
Miscellaneous:			
New seedings	523	9	5.3
Seed crops	73	1	0.8
Garden	42	1	0.4
Other	5	-	-
Total miscellaneous	643	11	6.5
TOTAL ACRES IN CROP	9,932	163	100.0

Like other areas with a large amount of range land and range livestock, most of the crops are grown for the purpose of feeding local livestock. Therefore, most of the crop acreage is used for hay. None of the farmland is devoted to intensive commercial row crops or orchards.

TABLE 3. UTILIZATION OF LAND IN CROPS AND TYPE OF FARMING

Keating Area - 61 farms - 1939

Type of farming	Number farms	Per cent of total crop acres in		
		Hay	Grain	Miscellaneous
Beef cattle	16	80	15	5
Sheep	6	80	10	10
Dairy	14	67	27	6
General livestock	17	48	48	4
Crops	8	71	24	5
ALL FARMS	61	74	20	6

There is a definite relation between the kind of livestock kept and the use of land. On dairy and general livestock farms, a larger proportion of the acreage in crop is devoted to grain than is the case on cattle and sheep ranches. This is because dairy stock, hogs and poultry which account for most of the livestock on dairy and general livestock farms require considerable quantities of grain whereas beef cattle and sheep under conditions prevailing in this area consume relatively small quantities.

TABLE 4. ANIMAL UNITS OF LIVESTOCK

Keating Area - 61 farms - 1939

Kind of livestock	Total animal units/1	Per cent of total
Beef cattle	3,360	43
Range sheep	2,476	32
Dairy cattle	797	10
Workstock	637	8
Other livestock	566	7
TOTAL ANIMAL UNITS	7,836	100

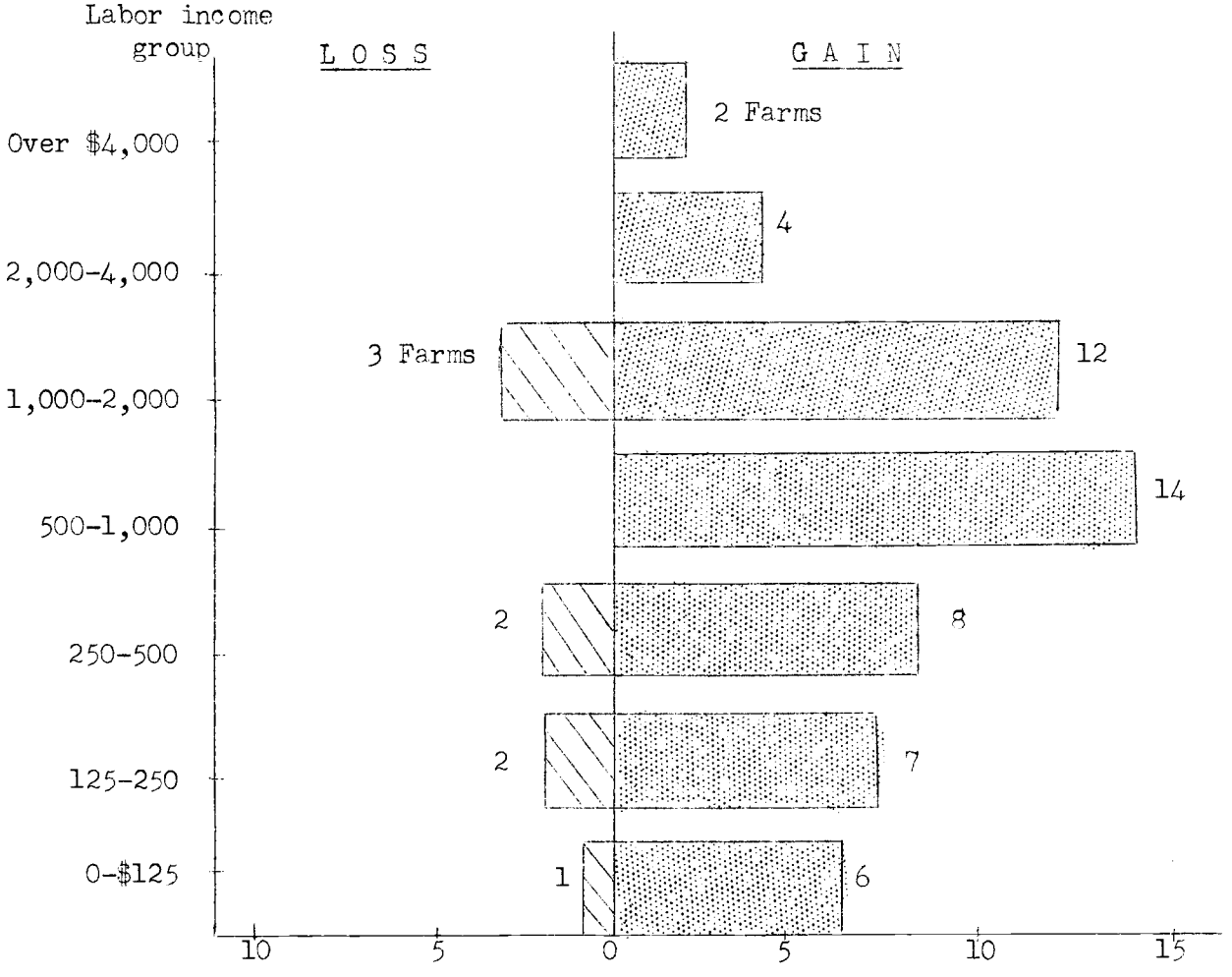
/1 See Item 1, Explanation of Terms, Page 30.

Beef cattle and range sheep account for 75 per cent of the total animal units of livestock in the area. However, on most farms, dairying is an important enterprise.

Saddle horses and pack horses and pack mules constitute a large percentage of the workstock.

TABLE 5. DISTRIBUTION OF LABOR INCOME /1
(Average $832 per farm)

Keating Area - 61 farms - 1939



/1 See Item 13, Explanation of Terms, Page 31.

In general the incomes received during the year of the study (1939) can be considered satisfactory. The operators received an average of $832 for their year's labor and management, which is about $20 more than they estimated their own labor and management to be worth.

TABLE 6. SIZE OF FARM AND TYPE OF FARMING

Keating Area - 61 farms - 1939

Type of farming	No. farms	Acres in crop	Acres private range	Animal units livestock	Total farm investment/1	Average No. of men /1
Beef cattle . . .	16	263	3,302	219	$ 46,478	3.1
Sheep	6	442	5,918	517	91,127	6.8
Dairy	14	79	458	39	11,082	1.5
General livestock	17	72	207	30	10,413	1.4
Crop	8	94	176	19	11,264	1.7
ALL FARMS	61	163	1,634	129	$ 28,077	2.4

/1 See items 2 and 4, Explanation of Terms, page 30.

In general, range livestock ranches are much larger than other types of farming when measured by crop acres, range land acres, animal units, investment, or number of men employed.

TABLE 7. FINANCIAL RETURNS AND TYPE OF FARMING

Keating Area - 61 farms - 1939

Type of farming	Labor Income	Farm furnished living/1	Per cent return on investment	Years on this farm	Increase in net worth per year/1
Beef cattle .	$ 1,218	$ 592	4.5	21	$ 721
Sheep	2,635	616	5.4	20	868
Dairy	430	404	1.8	10	426
General livestock	235	359	-0.1	9	350
Crop	679	317	4.7	12	201
ALL FARMS . .	$ 832	$ 450	4.1	14	$ 561

/1 See Items 14 and 15, Explanation of Terms, page 31.

Both for 1939 and for a long-time period range sheep and cattle outfits seem to have been more successful than dairy, general livestock, and crop farms. The sheep and cattle outfits, however, represented a much larger investment and a much larger amount of land. The investment and the acreage of crop land were not only larger in total but were nearly twice as large per man employed. Many of the dairy, crop, and general farms did not have enough land and livestock to make proper use of the labor and machinery.

TABLE 8. AGE OF OPERATOR, FARMING EXPERIENCE, ETC., AND TYPE OF FARMING

Keating Area - 61 farms - 1939

Type of farming	Age of operator	Years farming experience	Operator's Original net worth	Operator's Present net worth	Per cent net farm income is of total farm receipts
Beef cattle . . .	54	32	$ 15,514	$ 30,756	35.2
Sheep	53	34	35,600	52,520	30.4
Dairy	46	21	3,406	7,794	32.1
General livestock .	45	23	2,910	6,221	32.7
Crop	55	31	3,584	6,402	44.2
ALL FARMS	50	27	$ 10,129	$ 18,153	33.5

Sheep ranches had the largest total increase in net worth, but dairy and general livestock farms had a relatively larger increase when compared with the original net worths.

TABLE 9. FINANCIAL SUMMARY OF 16 BEEF CATTLE RANCHES/1

Keating Area - 61 farms - 1939

	Item	Average per ranch
	Ranch receipts:	
1.	Crops sold	$ 653
2.	Livestock sold	6,789
3.	Livestock products sold	375
4.	AAA payments	293
5.	Miscellaneous	271
6.	TOTAL CASH RECEIPTS	$ 8,381
7.	Inventory increase	356
8.	TOTAL RANCH RECEIPTS	$ 8,737
	Ranch expenses:	
9.	Labor and board	$ 1,043
10.	Crop purchases	256
11.	Livestock purchases	1,621
12.	Machinery and equipment	1,007
13.	Buildings and improvements	196
14.	Property taxes	384
15.	General operating expenses	642
16.	TOTAL CASH EXPENSES	$ 5,149
17.	Unpaid family labor	511
18.	Inventory decrease	-
19.	TOTAL RANCH EXPENSES	$ 5,660
20.	NET RANCH INCOME (line 8 minus line 19)	$ 3,077
21.	NET FAMILY RANCH EARNINGS (Line 20 plus lines 17 & 26)	4,180
22.	Interest on investment (line 28 times 4%)	1,859
23.	OPERATOR'S LABOR INCOME (line 20 minus line 22)	1,218
24.	Return on investment (line 20 minus line 27)	2,104
25.	PER CENT RETURN ON INVESTMENT (line 24 divided by line 28)	4.5
26.	Value ranch-furnished living	592
27.	Value operator's time (operator's estimate)	973
28.	Total ranch investment (operator's estimate)	$46,478

/1 Total animal units on 16 ranches 3,510. Average animal units per ranch 219.

TABLE 10. SIZE OF BEEF CATTLE RANCHES AND INCOME

Keating Area - 16 farms - 1939

Cattle units per ranch/1	Number ranches	Labor Income	Value feed fed per cattle unit	Labor cost per cattle unit/1	Livestock return above feed and labor costs per cattle unit/1
Under 125	6	$ 588	$ 15.50	$ 18.80	$ -1.80
125 - 200	5	1,347	14.20	12.90	2.30
Over 200	5	1,834	9.10	10.10	6.60
ALL RANCHES	16	$1,218	$ 11.60	$ 12.40	$ 4.00

/1 See Items 1, 9, 10, Explanation of Terms, pages 30 and 31.

During 1939 larger numbers of cattle per ranch were definitely associated with higher incomes. Beef prices during this year were quite favorable and the large ranches were operated more efficiently. Over a long period, labor income tends to vary with increases in the number of cattle. This is a result of more efficient feeding, greater labor efficiency, and consequently higher livestock returns above feed and labor costs per cattle unit.

The gross returns per head of cattle were slightly higher on the smaller ranches indicating that perhaps the cattle were given better feed and care, but this was much more than offset by higher costs of feed and labor. The larger ranches, therefore, not only made a larger total labor income, but made a larger margin of profit per head. A study of the individual records shows that the ranches with more than 250 head had a distinct advantage over the smaller ranches.

TABLE 11. SIZE OF BEEF CATTLE RANCHES AND EFFICIENCY

Keating Area - 16 farms - 1939

Cattle units per ranch	Number ranches	Land charge per cattle unit/1	Acres private range per cattle unit	Cattle units per man	Per cent calf crop
Under 125	6	$10.00	29	42	74
125 - 200	5	8.70	25	55	70
Over 200	5	6.00	14	95	70
ALL RANCHES	16	$ 7.40	20	67	71

/1 See Item 8, Explanation of Terms, Page 30.

The smaller outfits had a higher calf crop, but were handicapped by a relatively less efficient use of labor and also by more private rangeland requirements with consequent higher land charges per cattle unit. The use of smaller amounts of private rangeland per cattle unit on the ranches having over 200 cattle units is mainly the result of these operators making more use of grazing on the national forest. The quality of rangeland and use of Grazing Service Allotments may have also affected the use of private rangeland.

TABLE 12. COMPARISON OF HIGH AND LOW INCOME BEEF CATTLE RANCHES

Keating Area - 16 farms - 1939

Item	Five high income ranches	Five low income ranches	All 16 beef cattle ranches
Labor income	$ 3,138	$ -368	$ 1,218
Per cent return on investment	7.1	-1.0	4.5
Increase in net worth per year	$ 1,302	$ 15	$ 721
Total ranch investment	$65,267	$44,500	$ 46,478
Acres in crop	388	218	263
Number cattle units	345	167	204
Per cent calf crop	73	67	71
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 /1	$ 5.50	$ 9.70	7.40
Acres private range per cattle unit.	15	20	20
Grazing fees per cattle unit	$ 0.50	$ 0.38	$ 0.45
Machine cost per crop acre	$ 2.30	$ 4.70	$ 3.10
Crop index /1	117	111	112

/1 See Items 6 and 8, Explanation of Terms, page 30.

The high income ranches were larger, were more efficient in their livestock production, in their labor program, and in their cropping program. Over a long period of time these high income ranches increased their net worth by $1,302 per year whereas the low income ranches had increased their net worth only $15 per year. On the high income ranches the total returns per cattle unit were not quite as high as on the low income ranches, but there was a larger profit. The low income ranches apparently took good care of their cattle, as is indicated by the gross returns, but their costs were entirely too high. This difference in cost is shown in practically all items--feed, labor, land, and machinery. In other words the managers of the high income ranches were able to operate their properties in such a way that costs were very low, but without sacrificing very much in the way of total returns on the livestock.

TABLE 13. DISTRIBUTION OF INVESTMENT ON 16 BEEF CATTLE AND 6 SHEEP RANCHES

Keating Area - 1939

Item	(16 Beef cattle ranches) Investment per		(6 Sheep ranches) Investment per /1		
	Ranch	Animal Unit	Ranch	Animal Unit	Sheep Unit
Land	$27,757	$ 136.40	$49,220	$ 99.70	$ 19.90
Buildings	4,217	20.70	7,175	14.50	2.90
Equipment	2,124	10.50	4,024	8.10	1.60
Workstock	698	3.40	1,131	2.30	.50
Productive Livestock	11,027	54.20	19,914	40.30	8.10
Operating Cash	211	1.00	800	1.60	.30
Miscellaneous	266	1.30	404	.80	.20
TOTAL INVESTMENT	$46,300	$ 227.50	$82,668	$ 167.30	$ 33.50

/1 The investment on sheep ranches as of June 1, 1938, does not include the value of 1938 lambs on hand.

On beef cattle ranches, the value of productive livestock represents about 24 per cent of the total ranch investment. On sheep ranches 31 per cent of the total ranch investment consists of productive livestock. This percentage of total investment in productive livestock may appear to be rather small, but it must be remembered these sheep outfits "shed lamb" in the early spring and consequently use about a ton and a half of hay per animal unit (5 sheep). Also the cattle outfits feed hay four months of the year and many of the operators fatten their steers. These methods of handling range 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 upon winter range with small amounts of hay and grain being fed.

TABLE 14. FINANCIAL SUMMARY OF 6 SHEEP RANCHES /1

Keating Area - 1939

	Item	Average per ranch
	Ranch receipts:	
1.	Crops sold	$ 168
2.	Livestock sold	13,114
3.	Livestock products sold	6,467
4.	AAA payments	517
5.	Miscellaneous	130
6.	TOTAL CASH RECEIPTS	20,396
7.	Inventory increase	277
8.	TOTAL RANCH RECEIPTS	$20,673
	Ranch expenses:	
9.	Labor and board	$ 3,870
10.	Crop purchases	1,369
11.	Livestock purchases	3,740
12.	Machinery and equipment	1,357
13.	Buildings and improvements	622
14.	Property taxes	679
15.	General operating expenses	2,286
16.	TOTAL CASH EXPENSES	$13,923
17.	Unpaid family labor	470
18.	Inventory decrease	-
19.	TOTAL RANCH EXPENSES	$14,393
20.	NET RANCH INCOME (line 8 minus line 19)	$ 6,280
21.	NET FAMILY RANCH EARNINGS (line 20 plus lines 17 & 26)	7,366
22.	Interest on investment (line 28 times 4%)	3,645
23.	OPERATOR'S LABOR INCOME (line 20 minus line 22)	2,635
24.	Return on investment (line 20 minus line 27)	4,929
25.	PER CENT RETURN ON INVESTMENT (line 24 divided by line 28)	5.4
26.	Value ranch-furnished living	616
27.	Value operator's time (operator's estimate)	1,351
28.	Total ranch investment (operator's estimate)	$91,127

/1 Total sheep units on 6 ranches 14,824. Average sheep units per ranch 2,470.

TABLE 15. COMPARISON OF HIGH AND LOW INCOME SHEEP RANCHES

Keating Area - 6 farms - 1939

Item	Two high income ranches	Two low income ranches	All six sheep ranches
Labor income	$ 4,812	$ 645	$ 2,635
Per cent return on investment.	8.1	2.2	5.4
Increase in net worth per year	$ 1,769	$ 716	$ 868
Total ranch investment	$ 85,190	$ 47,506	$91,127
Acres in crop	417	177	442
Number sheep units	2,348	1,422	2,470
Number ewes	1,788	1,225	1,842
Per cent lamb crop	114	114	113
Weight of lambs marketed	80	82	82
Pounds wool per ewe	9.9	9.7	10.1
Per cent death loss	7	9	7
Livestock returns per sheep unit	$ 7.70	$ 6.50	$ 6.70
Value feed fed per sheep unit.	$ 2.50	$ 2.10	$ 2.20
Labor cost per sheep unit	$ 2.40	$ 3.00	$ 2.30
Livestock returns above feed and labor costs per sheep unit	$ 2.80	$ 1.40	$ 2.20
Land charges per sheep unit	$ .99	$ 1.20	$ 1.09
Acres private range per sheep unit	2.3	3.2	2.5
Grazing fees per sheep unit	$ .09	$ .14	$ .08
Machine cost per crop acre	$ 5.40	$ 8.00	$ 5.00
Crop index	101	85	84

The larger incomes received by the two most successful ranches can be attributed to both size and efficiency. It will be noted that the high income ranches were able to get a slightly larger return per head of livestock. Their feed bill was slightly larger but they were able to effect substantial economies in the other major items of cost, as labor, land, and machine costs. Their crop yields were also much larger.

TABLE 16. RATE OF FEEDING AND INCOME ON 14 DAIRY FARMS

Keating Area - 1939

Value feed fed per animal unit Group	Average	No. farms	Labor income	Pounds butterfat per cow	Livestock returns per animal unit	Livestock returns above feed costs per animal unit	Crop index
Under $15	$11.70	5	$ 289	167	$ 42.40	$ 30.70	77
15 - 25..	20.00	4	436	194	62.20	42.20	88
Over $25	31.10	5	566	234	65.40	34.30	102
ALL DAIRY FARMS..	$19.30	14	$ 430	195	$ 55.00	$ 35.70	90

During 1939 the average butterfat production per cow for all dairy cows in Oregon was about 236 pounds, whereas cows on dairy farms in the Keating Area averaged only 195 pounds. Higher quality cows are definitely needed for these particular dairy farmers if their incomes are to be increased.

This table indicates that an intermediate scale of feeding is the most profitable. A study of the individual records shows that the more feed used, the greater the profit per animal up to the point where the feed bill exceeded $25 a head. Where the feed bill exceeded $25 per head the increased production did not offset the added cost for feed.

TABLE 17. LABOR EFFICIENCY AND INCOME ON 17 GENERAL LIVESTOCK FARMS

Keating Area - 1939

Productive man work units per man Group	Average	No. farms	Labor income	Labor costs per animal unit	Livestock returns above feed and labor costs per animal unit	Number animal units
Under 200 . .	150	7	$ -148	$ 50.50	$ -26.20	24
200 - 300 . .	244	6	315	30.00	2.80	21
Over 300 . .	350	4	786	23.90	9.90	34
ALL FARMS . .	215	17	$ 235	$ 36.00	$ -6.20	25

The productive man work units per man is essentially the number of average day's work accomplished by each man on the farm as measured by the livestock cared for and the crops produced. It is not necessarily the number of days actually worked.

In the first group, the actual accomplishment per man was equivalent to 150 days of average work. The third group average accomplishment was 350 days of average work. In this case it is quite improbable that the men on these farms actually put in 350 days at work, but by better farm management, they accomplished what would normally be equivalent to 350 days. 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.

TABLE 18. COMPARISON OF HIGH AND LOW INCOME GENERAL LIVESTOCK FARMS

Keating Area - 17 farms - 1939

Item	Five highest income farms	Five lowest income farms	All 17 general livestock farms
Labor Income	$ 1,014	$ -486	$ 235
Per cent return on investment	7.8	-5.3	-0.1
Increase in net worth per year	$ 684	$ 357	$ 350
Acres in crop	63	76	72
Animal units livestock	21	35	25
Total productive man work units /1	293	316	300
Average number of men /1	1.1	1.7	1.4
Productive man work units per man	262	185	215
Livestock returns per animal unit	$ 80.00	$ 45.10	$ 55.00
Value of feed fed per animal unit	$ 34.80	$ 21.10	$ 25.70
Livestock returns above feed costs per animal unit	$ 45.20	$ 24.00	$ 29.30
Crop index	144	92	102

/1 See Items 3 and 4, Explanation of Terms, page 30.

The high income general livestock farms were smaller in terms of acreage than the low income general livestock farms, but their efficient labor program, livestock production, and efficient cropping program more than offset any handicap due to size. The operators accomplished more work in the year, the livestock were better fed, gave higher gross returns per unit, and a larger margin above feed costs. Crop yields were also higher.

TABLE 19. COMPARISON OF HIGH AND LOW INCOME CROP FARMS

Keating Area - 8 farms - 1939

Item	Three highest income farms	Three lowest income farms	All 8 crop farms
Labor income	$ 1,247	$ 207	$ 679
Per cent return on investment	7.3	-0.9	4.7
Increase in net worth per year	$ 361	$ 169	$ 201
Total farm investment	$ 17,171	$ 5,947	$11,264
Acres in crop	128	63	94
Animal units livestock	24	4	14
Total productive man work units	365	180	268
Average number of men	1.9	1.4	1.7
Productive man work units per man	194	125	159
Livestock returns per animal unit	$ 58.70	$ 67.60	$ 58.20
Value feed fed per animal unit	$ 16.10	$ 32.70	$ 18.20
Livestock returns above feed costs per animal unit	$ 42.60	$ 34.90	$ 40.00
Machine cost per crop acre	$ 3.90	$ 4.60	$ 3.90
Crop index	104	103	109

High income crop farms were much larger, had more efficient labor and livestock programs and consequently received considerably higher incomes than the low income farms.

TABLE 20. SIZE OF FARM AND INCOME

Keating Area - 61 farms - 1939

Total investment per farm	No. farms	Acres		Animal units livestock	Labor Income
		In crops	Private range		
Under $5,000	6	33	236	13	$ 224
5,000 - 15,000	25	78	317	31	397
15,000 - 25,000 . . .	11	119	577	77	514
25,000 - 50,000 . . .	8	199	3,592	161	1,184
Over $50,000	11	443	5,023	441	2,214
ALL FARMS	61	163	1,634	128	$ 832

During the one year studied, the operators of the largest farms and ranches, taken as a group, received the highest incomes.

TABLE 21. SIZE OF FARM, EFFICIENCY, AND FINANCIAL PROGRESS

Keating Area - 61 farms - 1939

Total investment per farm	No. farms	PMWU per man	Machine cost per crop acre	Per cent return on investment	Increase in net worth per year
Under $5,000 . .	6	162	$ 6.83	-4.1	$ 80
5,000 - 15,000 .	25	212	5.00	0.8	347
15,000 - 25,000	11	249	5.15	3.2	555
25,000 - 50,000	8	225	3.85	4.3	1,019
Over $50,000 . .	11	264	3.82	5.2	576
ALL FARMS . . .	61	238	$ 4.27	4.1	$ 561

During the one year of the study, it appears that an average investment of $15,000 or more was necessary for the farm business to be large enough to return a fair rate of interest on the farm investment. On the smaller farms, labor was not fully accomplished while the overhead investment in machinery was too high for the amount of work to be done.

SECTION II

The Sparta Area

TABLE 22. UTILIZATION OF PRIVATELY OWNED LAND

Sparta Area - 19 farms - 1939

Land use	Total Acres	Acres per farm	Per cent of total
In crop	1,358	71.5	15.0
Idle or fallow	290	15.2	3.2
Cropland pasture	124	6.5	1.4
TOTAL CROPLAND	1,772	93.2	19.6
Farmstead	64	3.3	0.7
Private rangeland	7,231	380.7	79.7
TOTAL ACRES	9,067	477.2	100.0

Although the farms in the Sparta Area averaged 477 acres per farm, they are still very small units. Most of the 477 acres is grazing land. The remaining 93 acres of dry farmed cropland is hardly enough in this area to provide a farmer and his family with an income large enough for a satisfactory standard of living.

TABLE 23. UTILIZATION OF LAND IN CROPS

Sparta Area - 19 farms - 1939

Crop	Acres per farm	Per cent of total
Hay:		
Alfalfa hay	27.4	38.3
Grain hay	8.1	11.3
Total hay	35.5	49.6
Grain:		
Wheat	14.7	20.6
Barley	5.0	7.0
Miscellaneous grain	6.8	9.5
Total grain	26.5	37.1
Miscellaneous:		
New seedings	6.0	8.4
Garden	0.9	1.3
Other	2.6	3.6
Total miscellaneous	9.5	13.3
TOTAL ACRES IN CROP	71.5	100.0

Livestock are relatively less important in the Sparta Area than in the Keating Area. For this reason more acreage is devoted to the production of cash grain crops.

One cutting of hay and one seed crop were harvested from about a fourth of the alfalfa acreage. The sale of this seed, which is mostly of the Ladak variety, is an important source of income.

TABLE 24. ANIMAL UNITS OF LIVESTOCK

Sparta Area - 19 farms - 1939

Kind of livestock	Total animal units	Per cent of total
Dairy cattle	131	34
Beef cattle	47	13
Workstock	126	33
Other livestock	78	20
TOTAL ANIMAL UNITS	382	100

Range livestock are relatively unimportant in this area and occur on only one farm. Workstock, consisting of 15 animal units of saddle horses and 110 animal units of draft animals, are almost as important as dairy cattle in so far as numbers are concerned.

TABLE 25. TOTAL FARM INVESTMENT/1

Sparta Area - 19 farms - 1939

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

/1 As of June 1, 1938.

The average investment per farm is very low when compared with other areas in Oregon where farm organization studies have been made. The values of farm dwellings were especially low and according to the farm operators averaged only $380 per farm.

TABLE 26. FINANCIAL SUMMARY

Sparta Area - 19 farms - 1939

	Item	Average per farm
	Receipts:	
1.	Crops sold	$ 224
2.	Livestock sold	407
3.	Livestock products sold	154
4.	AAA payments	88
5.	Miscellaneous	114
6.	TOTAL CASH RECEIPTS	$ 987
7.	Inventory increase	90
8.	TOTAL FARM RECEIPTS	$ 1,077
	Expenses:	
9.	Labor and board	$ 76
10.	Crop purchases	71
11.	Livestock purchases	81
12.	Machinery and equipment	305
13.	Buildings and improvements	18
14.	Property taxes	49
15.	General operating expenses	123
16.	TOTAL CASH EXPENSES	$ 723
17.	Unpaid family labor	158
18.	Inventory decrease	-
19.	TOTAL FARM EXPENSES	$ 881
20.	NET FARM INCOME (line 8 minus line 19)	$ 196
21.	NET FAMILY FARM EARNINGS (line 20 plus lines 17 & 26)	656
22.	Interest on investment (line 28 times 4%)	230
23.	OPERATOR'S LABOR INCOME (line 20 minus line 22)	-34
24.	Return on investment (line 20 minus line 27)	-325
25.	PER CENT RETURN ON INVESTMENT (line 24 divided by line 28)	-5.7
26.	Value farm furnished living	302
27.	Value of operator's time (operator's estimate)	521
28.	Total farm investment (operator's estimate)	$ 5,741

With possibly one or two exceptions all farms in the area are so small that on the average the operator received a minus wage for management and also received a minus return on farm investment. Altogether the operator and his family received an average of only $656, including farm furnished living, with which to live on and pay farm debts.

EXPLANATION OF TERMS

1. Animal unit is one cow, 5 mature sheep, 100 hens, or their equivalent in other livestock. A cattle unit is an animal unit of livestock on a beef cattle ranch. A sheep unit is one-fifth of an animal unit of livestock on a sheep ranch.

2. 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.

3. 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 a year while about two days of man labor are required to grow and harvest an acre of 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.

4. Average number of men is the total amount of labor actually devoted to work on the farm or farms in question, coverted to the equivalent of yearly full-time workers. In this study, the entire time of the operator is charged aginst the farm unless he is known to be employed elsewhere.

5. Productive man work units per man are the number of average day's work to be done on the farm by each man in a year. It is determined by dividing the total "productive man work units" (definition 3) by the "average number of men" (definition 4). The number of productive man work units per man, therefore, indicates, at least in a general way, the accomplishments of the available labor.

6. 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.

7. Machine cost is the total of all cash and non-cash 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 four per cent.

8. Land charge is the sum of taxes on land, grazing fees, and four per cent interest on the value of all privately owned land operated.

9. Labor cost is the total value of all farm labor. It includes the value of hired labor, and the wage estimated by the operator for his own time and the time of any unpaid members of his family.

10. 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 and the cost of livestock purchased from the sum of the value of livestock at the end of the year and the receipts from livestock and livestock products sold.

11. Net farm income is the compensation for total farm investment and for the labor and management of the operator. It is derived by deducting total farm expenses from total farm receipts.

12. Net family farm earnings is the compensation, including the value of farm furnished living for total farm investment, labor and management of the operator, and for labor of unpaid members of the operator's family. It is derived by deducting total farm expenses, exclusive of value of unpaid family labor, from total farm receipts.

13. Labor income is the compensation for the operator's labor and management. It is derived by deducting four per cent interest on the total farm investment from the net farm income. In addition, the operator has had a house to live in and has had the benefit of farm-furnished food and fuel.

14. Farm-furnished living is the farm value of farm-grown food, fuel, and other products used by the family plus the value of the use of the farm dwelling.

15. Increase in net worth per year is the amount of net worth (value of property) which the operator has been able to accumulate per year on the average during the entire time he has been on his farm. It is computed by subtracting the operator's net worth at the time he moved onto (or purchased) the farm from his present net worth and dividing the remainder by the number of years he has been on the farm.