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Historical Development and Adjustments on North Unit Deschutes Irrigation Project Farms

Norman D. Kimball
Emery N. Castle



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AUTHORS: Norman D. Kimball is a former Graduate Assistant, Department of Agricultural Economics, Oregon State University. Present address: Farm Economics Division, Economic Research Service, U. S. Department of Agriculture, Madison, Wisconsin. Emery Castle is Professor of Agricultural Economics, Oregon State University.

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HISTORICAL DEVELOPMENT AND ADJUSTMENTS ON
NORTH UNIT DESCHUTES IRRIGATION
PROJECT FARMS

Norman D. Kimball and Emery N. Castle

INTRODUCTION

The North Unit of the Deschutes Irrigation Project is comprised of 50,000 irrigable acres lying within the boundaries of the North Unit Irrigation District, a landowners' organization originally established in 1916. The district is located in the Deschutes River Basin of the broad intermountain plain of west-central Oregon adjacent to and east of the deep gorges of the Deschutes and Crooked Rivers. The North Unit was authorized for construction by the Bureau of Reclamation on November 1, 1937.

The first water was delivered to the project for the crop year of 1946. By 1949, water was available for all project lands. The project was divided up into 642 ownership units with an average size of 77 acres. From the beginning, owners found it profitable to combine ownership units into larger operating units. The original units were formed to further fundamental objectives of Federal reclamation: (1) to distribute widely government-involved interest-free funds for irrigation; (2) to provide opportunity for the maximum number of settlers^{1/} on the land; and (3) to promote the family farm as a desirable way of life. When the North Unit Project was established, economically efficient units were not an objective of reclamation policy.

North Unit Project farms were initially planned as subsistence units during the depressed conditions of the late thirties. Home-produced foods and diversified livestock programs were important elements in farm plans. By the time the project was completely settled in 1949, technology and economic conditions had changed so that subsistence units were no longer suitable as family farms.

Prices received for crops grown during the first few project years were unusually favorable, especially for hay, potatoes, and Ladino clover seed. After 1952, prices of these crops declined considerably, causing financial hardship and even failure among North Unit Project farmers. From 1948 to 1953, prices paid increased by more than 7 percent, which further decreased farm incomes.

Farmers adjusted to the cost-price squeeze by increasing farm size. Improved equipment permitted farming of larger acreages, which were necessary for profitable farms. Since total acres were limited in the project area, more acres per farmer also meant that there would need to be fewer farmers. The most efficient farmers found it possible and profitable to buy or rent land from the less efficient farmers. Other farmers had to seek employment off the farm or accept a substandard level of living from reduced farm incomes.

Changes in commodity prices, such as Ladino clover and potatoes, made it imperative for farmers to change to different combinations of crops. Also, higher valued varieties of clover and grass for seed and specialty crops, such as mint,

^{1/} United States Bureau of Reclamation. Land ownership survey on federal reclamation projects. Washington, 1946. p. 54.

were introduced. Some farmers added a beef feeding enterprise to their operations to increase farm income. This was particularly true when additional land was unavailable or when alternative crops were less profitable. As might have been expected, few dairy farms were developed on small family units because of market conditions and more profitable alternative farm programs.

Objectives of Study

The first objective of this study was to appraise the present farm situation in terms of income, farm size and organization, and financial situation. Purpose was to determine whether the area had achieved a measure of stability or whether further adjustments could be anticipated.

A second objective was to identify causes of maladjustments, if any, in the farm organizations. The hypotheses were as follows: (1) the project was originally divided into uneconomic farm units; (2) capital, owned or borrowed, had not been available in adequate quantities to develop and operate new units properly; (3) new settlers lacked necessary irrigation farming experience; and (4) unusually favorable price relationships prevailed at time of settlement.

A third objective was to appraise or evaluate some of the farm and off-farm adjustment possibilities. Examples of adjustments considered were: (1) On-farm adjustments such as (a) shifting resources among enterprises, (b) specialization, (c) introduction of livestock, (d) increasing farm acreage; (2) Off-farm adjustments such as (a) part-time off-farm work and (b) full-time nonfarm work.

A fourth objective was to analyze obstacles to needed adjustments. In some instances, obstacles would be of a personal nature -- age, individual abilities, preferences, and so on. Other obstacles might be lack of land or capital for expansion of the farm business or lack of off-farm employment possibilities.

Methodology

A sample of 60 farmers on the North Unit Project were interviewed in summer 1958. Fifty-six complete, usable schedules were obtained. For sampling purposes, farms were stratified according to acreage and project area, and a random sample was drawn. All farms of less than 30 acres were excluded. The small Opal City and Trail Crossing areas were excluded because the few farms in these areas differed considerably from the rest of the project farms. After these exclusions, 346 operating units remained of the original population of 407.

Farm costs, returns, and labor and capital requirements were calculated for modal farms representing small, medium-sized, and large farms under 1957 project conditions. These farms were budgeted to determine maximum incomes possible with average amounts of labor and operating capital restricting farm size. In addition to finding optimums with 1957 price-cost relationships and average management, a high level of management was assumed with 1957 to 1959 average prices. Value of an additional dollar of operating capital, together with one hour of labor, was calculated to determine profitability of expansion beyond the maximum size imposed by average labor and capital limitations.

Oregon and United States census and other statistical data were used to analyze farm and community development in the project area. This analysis permitted estimates of future on-farm and off-farm adjustments that may take place.

It also suggested obstacles and problems likely to be encountered in attaining these adjustments.

HISTORY AND DESCRIPTION OF AREA

The North Unit Project lies within the North Unit Irrigation District of central Oregon. The district extends 28 miles north and south and is 12 miles wide. It occupies a lava plateau bounded on the west by the deep canyon of the Deschutes River and on the east by the Ochoco Mountains (Figure 1).

The North Unit has an arid, relatively moderate climate with an annual rainfall averaging about 10 inches. At Madras, summer rainfall averages only 1.15 inches. July temperatures average 66 degrees and January temperatures 31 degrees. Recorded extremes are 112 and minus 45 degrees.

The average growing season of 130 days is long enough for hardy field and row crops. The total seasonal heat units of 3,000 degrees above 42 during the growing season are relatively low compared with other irrigated areas in the West. Warm-season crops cannot be grown successfully under these conditions. 1/

Topography of the land is varied with the irrigated land smoothly undulating to gently rolling. Two-thirds of the area consists of sandy textured soils; the rest is principally loam. Shallow depth is the most serious limitation to soil productivity.

Development of Farming in Area

In its early days, the North Unit area was devoted almost exclusively to sheep grazing. As a favorable weather cycle developed, dryland grain-fallow farming gradually replaced sheep raising. By 1900, dry farming was moderately prosperous, although there were frequent droughts. At this time, the North Unit area was settled mainly in holdings of 160 acres or more with complete sets of farm buildings. In 1926, about 40,000 acres of land currently in the North Unit Irrigation District were dry farmed.

Rainfall was adequate for wheat-fallow farming between 1900 and 1922. A gradual decline in rainfall set in after 1922. Drought conditions in 1934 caused a complete crop failure. By 1939, only 12 percent of the cropland was actually harvested. Between 1930 and 1940, the number of farms in Jefferson County, where North Unit lands are located, declined by one-third as declining crop acreages and yields bankrupted many farmers.

Irrigation had been carried on in the Deschutes Basin as early as 1871. The first irrigation development was the Central Oregon Deschutes Project just south of the present North Unit Project; water was made available for 45,000 acres in 1900. Several other districts were organized in the Deschutes Basin prior to establishment of the North Unit Irrigation District in 1916.

Project Development Plans

The Oregon Cooperative Work Plan of 1913-15 was the first serious study of the possibility of irrigating this area. Main feature of the plan was the storage
1/ U.S. Bureau of Reclamation. Economic report and repayment plan, North Unit, Deschutes Project, Oregon. Boise, rev. 1951. 113 p. (Branch of Operation and Maintenance, Idaho).

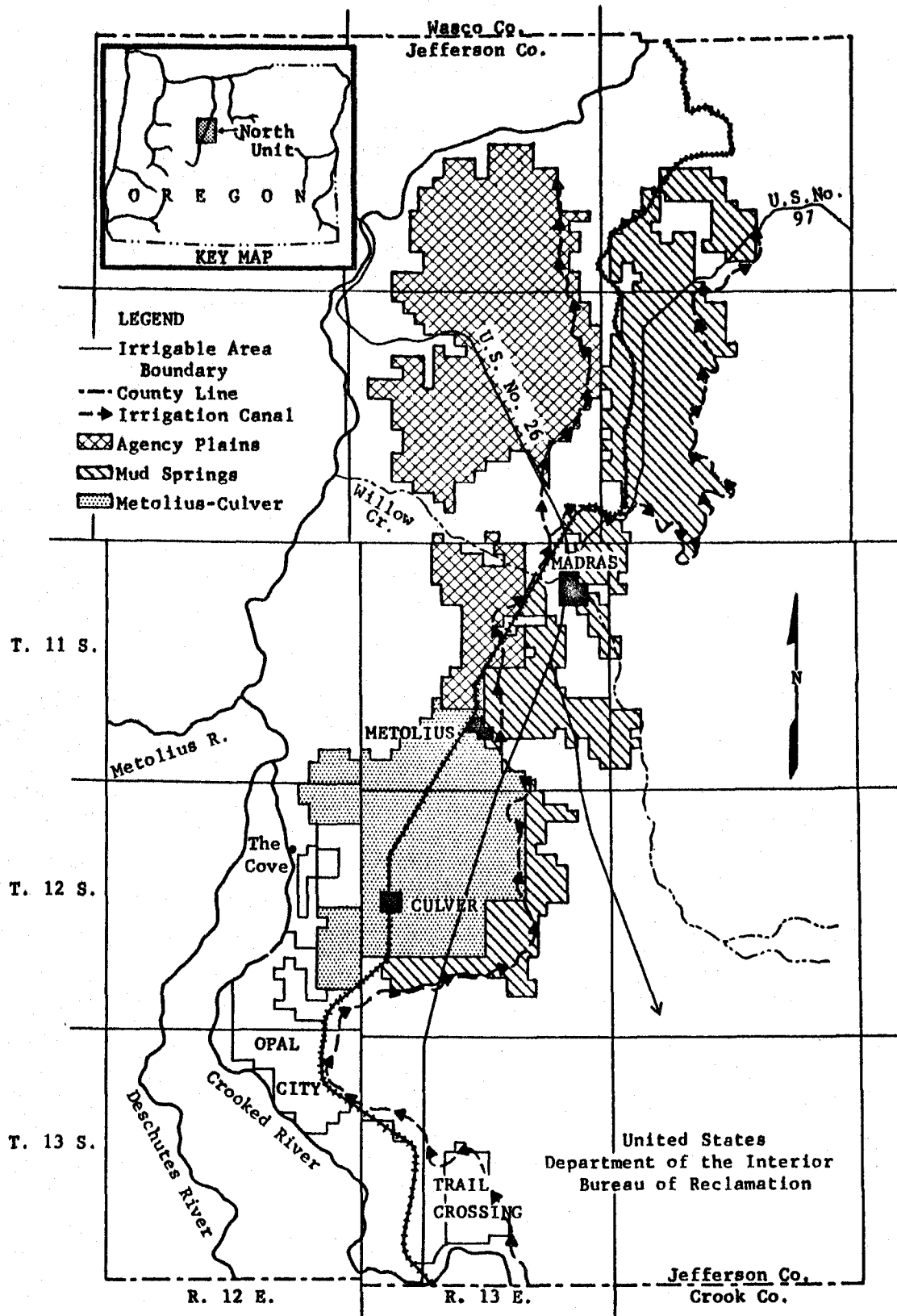


Figure 1. Deschutes Project, Oregon, North Unit, General Map.

facility at Benham Falls. In 1916, a second plan similar to the previous one was made by Herrmann and Wiley. The North Unit Irrigation District attempted to raise \$5,000,000 for private construction of the project. It succeeded in raising only \$90,000, which was used to pay for the Herrmann-Wiley report.

The Bureau of Reclamation made a revision of the previous plans in 1922. A Federal appropriation of \$500,000 with which to begin project construction was obtained. Landowners informally rejected the Bureau's plan because of the stipulation that an individual could own only 160 acres. Private interests had offered to build the project if the Bureau of Reclamation offer was not accepted. However, shortly after the Bureau's offer was withdrawn, the private offer also was withdrawn.

A new project plan was made by the Bureau in 1936. ^{1/} It differed from previous plans in that storage would be at the Wickiup site 30 miles farther up-river from the project. Benham Falls was rejected as too leaky for use. Estimated cost of the newly planned project, \$180 per acre, was double the previously planned cost. Water would be available for 50,000 instead of 80,000 acres.

The finding of feasibility under which the North Unit was authorized was signed by the President on November 1, 1937. Total cost to be charged to irrigation users amounted to \$8,000,000. The finding of feasibility indicated that the reimbursable portion of the cost of construction would be returned with a maximum period of 40 years fixed by Reclamation law. C.C.C. camp labor was to be utilized to supply \$2,005,000 worth of labor, leaving about \$6 million to be repaid by water users.

Although Reclamation law would have allowed individuals to own 160 acres of land each, the contract signed by the water users in 1937 restricted ownership to 40 acres. This requirement was imposed without any economic study of the Deschutes area to determine size of farm requisite to success. The small size of units was justified on the basis of experience on older Reclamation projects where farms of 40 to 80 acres had provided sufficient revenue to repay project costs.

In 1944, water users formally requested that limitations on land holdings be increased to 80 acres per person, or 160 acres for man and wife. A study was made on farm size in the North Unit in 1945. The study showed that the 40-acre limitation was unduly restrictive. The limitation was changed to allow up to 160 acres per farm family.

A new contract containing the 160-acre provision was made in 1945. The repayment obligation had increased to \$9,500,000. When the project was completely settled in 1949, additional costs had increased the water users' total obligation to \$11,050,000.

No economic study had been made up to 1950 on the earning capacity (repayment ability) of project lands. Since expenditures and project settlement were virtually completed in 1949, a study was undertaken to determine repayment ability of irrigable land in the project.^{2/} The study indicated that construction cost could be

^{1/} Fisher, C. C. Deschutes Investigations. Part 3. Boise, U. S. Bureau of Reclamation, 1936. 90 p.

^{2/} United States Bureau of Reclamation. Economic report and repayment plan. op.cit. p. 3.

paid off in 64 rather than 40 years as required under the basic Reclamation law. Special congressional authorization was obtained to allow the longer repayment period.

After the project was in operation, it was discovered that the long distance from the project to the reservoir made efficient delivery of water impossible during peak demands. The Haystack equalizing reservoir was authorized in 1954 to rectify this situation. Water users were obligated for an additional \$1,600,000. Final repayment obligations amounted to \$12,130,000, with the repayment period extended to 78 years. Assessments began in 1957, 20 years after the project was authorized.

The long time period following original authorization and the inadequacy of the original system were the main reasons why contract adjustments were necessary. Construction charges per acre increased from \$160 as stipulated in the 1938 contract to \$243 as the final charge. Had the final cost been known at the time the project was authorized in 1937, the project could not have been found feasible under the basic Reclamation requirements that projects would need to repay construction charges within 40 years.

FARM ADJUSTMENTS

Farm Size

The original 50,000 acres in the North Unit were divided into 642 ownership units with an average size of 77 acres. Within 3 years of first project settlement, farmers had combined the original ownership units into 550 operating units. Consolidations continued through the 1950's. By 1958, the number of operating units had declined to 407, 37 percent less than the original ownership units. Average size had increased to 122 irrigable acres per farm, or by 60 percent.

Figure 2 illustrates graphically the decreased number of farm units with less than 160 acres and the resultant increase in those over 160 acres. Only 5 percent of the 1949 operating units contained more than 160 acres compared with 22 percent in 1957. The number of farms having more than 300 acres increased from 3 to 17 in the same period.

The number of small farms with less than 40 acres made up a greater percentage of total operating units in 1957 than in 1949, 17 compared with 14 percent, although their numbers decreased by 9 units. Few consolidations occurred in the less-than-40-acre farms because they were too small to provide the income necessary for expansion and they were usually operated by persons who had off-farm jobs.

This increase in number of large farms caused a shift in number of acres in each size class. Acreage in farms of more than 160 acres increased from 5,800 in 1949 to 22,200 in 1957 (Figure 3). Only 16 percent of the total irrigated acreage remained in farms of less than 80 acres in 1957.

Area Agricultural Growth

The development of the North Unit Project shifted the type of farming from primarily dry farming to irrigated farming in Jefferson County, where the project is located.

In 1944, before the project, there were 282 farms of all types in Jefferson County (Table 1). Within the next 5 years, the project was completed and the number of farms had increased by 100 percent. Irrigated acreage increased 10 times. Sixty percent of the dry farms of 1944 were irrigated in 1949. The total number of dryland farms decreased from 261 to 107 because only the best land was included in the project and most of this land had been in dryland farms before the project.

Table 1. Agricultural Growth in Jefferson County

Item	1944	1949	1954	1959
Number of farms	282	567	590	450
Number irrigated farms	61	460	493	378
Acres irrigated	3,800	39,635	54,789	53,176
Number farm workers ^{1/}	397 ^{2/}	1,177 ^{2/}	858	580

^{1/} Includes farm operator, family workers, and regular hired workers.

^{2/} Includes seasonal workers.

Source: U.S. Census of Agriculture.

During the 1950's, total number of farms in Jefferson County decreased about 20 percent. Number of dryland farms decreased 30 percent (Table 1). After reaching a high of 493 units in 1954, the number of irrigated farms decreased 23 percent in the following 5 years. The number of irrigated acres per farm increased from 111 to 141 in the 1954-59 period. During the same time period, number of workers per farm decreased from 1.7 to 1.5.

Importance of the North Unit Project to the agricultural growth of Jefferson County can be shown by comparing Jefferson County with two neighboring counties, Deschutes and Crook (Table 2).

Table 2. Dollar Value^{1/} of Crops and Farm Products Sold in Jefferson, Deschutes, and Crook Counties, Selected Years, 1944 to 1954.

Item	Year	County		
		Jefferson	Deschutes	Crook
Value of farm products sold (\$1,000)	1944	\$1,715	\$3,674	\$3,787
	1949	4,565	3,838	5,047
	1954	9,628	3,841	5,217
Value of crops sold per acre	1944	\$18.31	\$ 32.89	\$ 24.82
	1949	64.67	31.28	44.70
	1954	107.25	41.51	41.02
Value of products sold per farm	1944	\$6,074	\$3,667	\$8,023
	1949	8,051	4,096	10,693
	1954	16,319	3,600	13,275

^{1/} Adjusted to the 1949 Oregon prices-received index.

Source: United States Census of Agriculture.

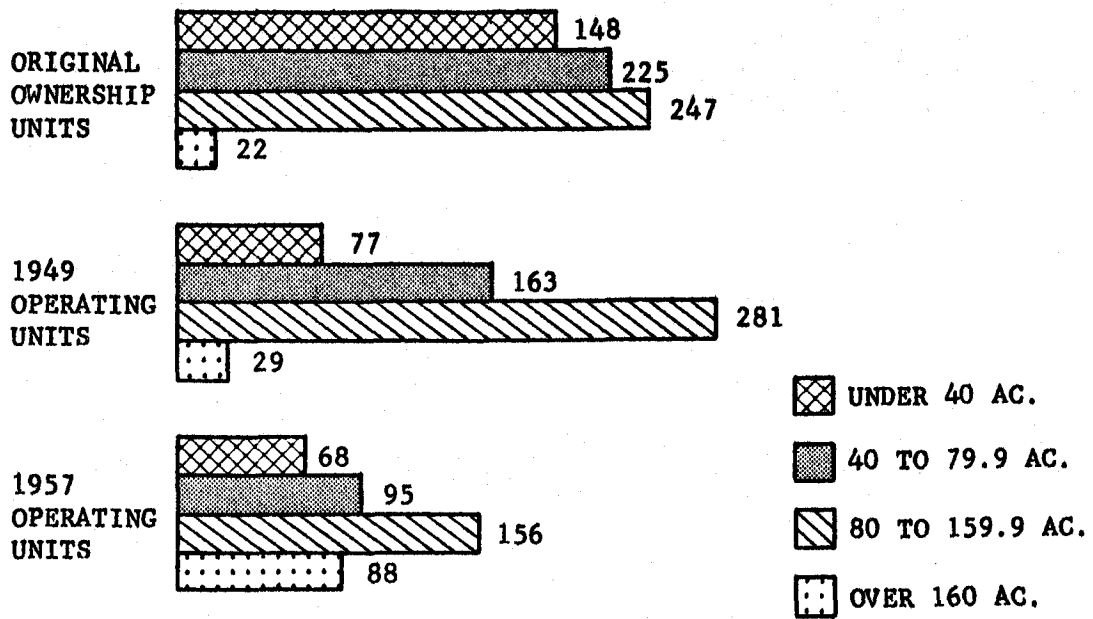


Figure 2. Number of farm units by size class for selected years, North Unit Deschutes Project, Oregon.

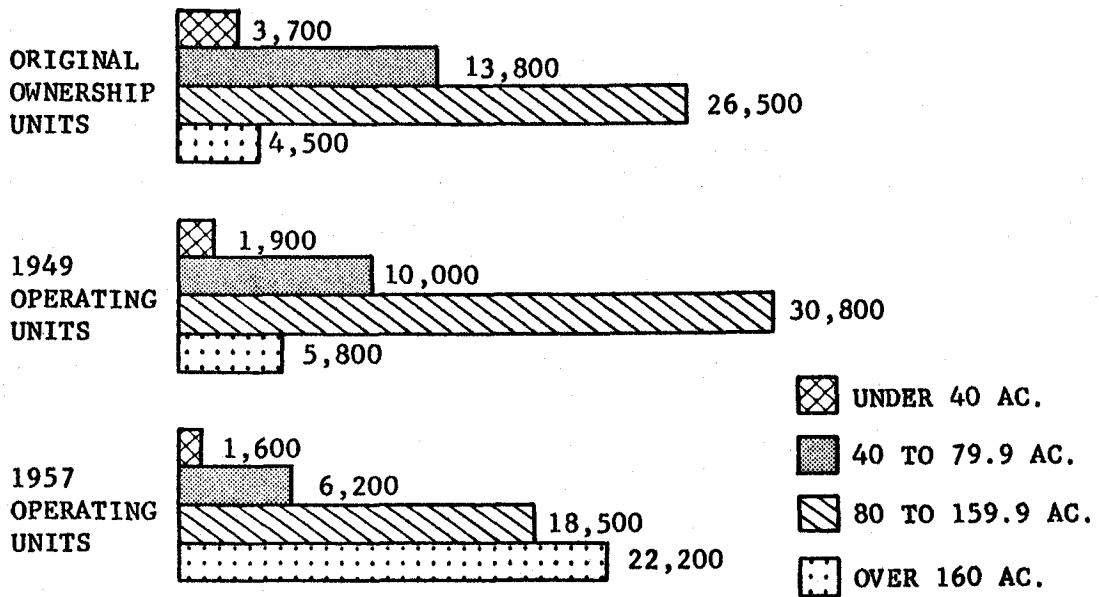


Figure 3. Total irrigated acreage in various farm size classes for selected years, North Unit Deschutes Project, Oregon.

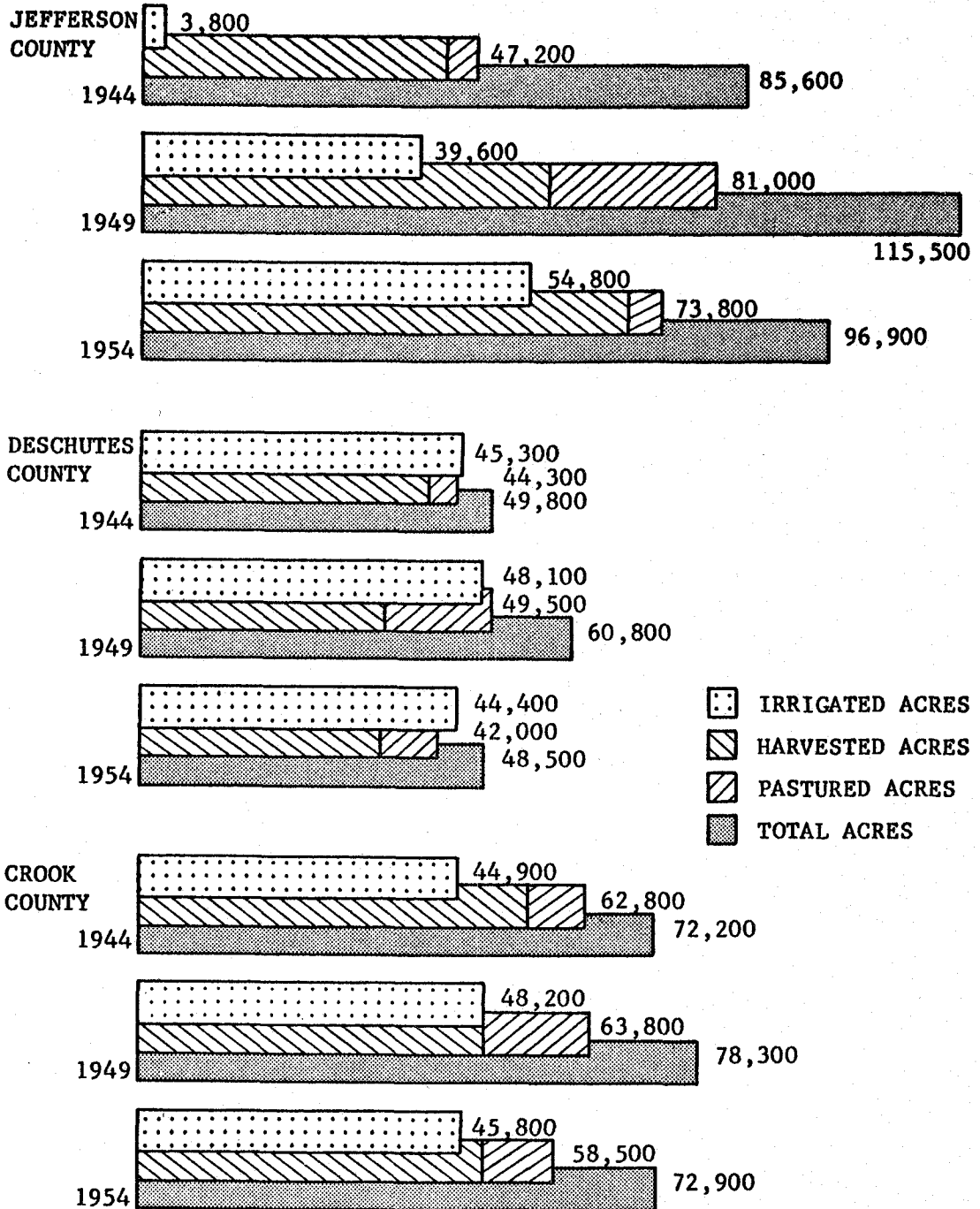


Figure 4. Cropland acreage by use for selected counties and years.

Source: U.S. Census of Agriculture.

The large increase in the total value of farm products sold in Jefferson County was due primarily to the increase in irrigated acreage. Value of crops sold per acre increased sixfold from 1944 to 1954, whereas in the other two counties with a relatively constant amount of irrigated land during this period, increase of crop value per acre was 43 percent.

Table 2 also shows that value of products sold per farm increased much more in Jefferson County than in the other two. From 1944 to 1954, average value increased by 169 percent. By contrast, Deschutes County farmers had a smaller average income in 1954 than in 1944. The percentage increase in gross income per farm in Jefferson County was over 10 times greater than the state average increase in the 10-year period. Jefferson County's average income per farm was 142 percent greater than the state average in 1954.

Farm Enlargement

Survey information was obtained to trace the pattern of farm enlargement. Farm operators survey in 1958 started with an average of 111 acres of irrigated cropland. By 1958, average size had increased to 152 acres. Usually, farms were enlarged by buying or renting a complete ownership unit. In a few instances farm operators rented part of an ownership unit for growing potatoes.

In the 30 to 89.9 acre farm size class, none of the farm operators acquired additional acreage. Their 1958 units were the same size as when they began their farm operations (Table 3).

Table 3. Number of Farms, Average Irrigated Acreages, and Number of Land Acquisitions, Sample of North Unit Project Farmers

Size group	Number of farms	Beginning acreage	1958 acreage	Units per farm ^{1/}
30-89.9	18	62	63	1.00
90-159.9	21	117	135	1.19
Over 160	17	151	267	2.35

^{1/} Average number of farm units acquired by present operator.

Six of the 21 farm operators in the 90 to 159.9 acre class had enlarged their farms. Four operators had acquired one additional farm unit each. The other two developed 30 acres of previously owned, nonirrigated acreage. Average irrigated acreage increased from 117 to 135 acres while under the control of the 1958 operator.

Twenty-two percent of the farm operators had more than 160 irrigated acres each and 45 percent of the project land was in farms of over 160 acres in 1958. Presumably, all farms in this size class are made up of more than one original unit as the 1945 contract specified that each owner would be limited to 80 acres and each family to 160 acres. Actually, two of the original owner-operators had land in excess of 160 acres when they first

acquired water in 1948 and 1949. One had 170 and the other 175 acres. This situation arose because the farmer was able to irrigate lands that were not originally classified as irrigable.

Farmers in the over-160-acre-size class began their operations as early as 1946 and as late as 1957. Only six farmers started operations with more than 160 acres, the largest being 260 acres. Four started with 80 acres or less, with the smallest unit containing 27 acres. The average beginning farm operating unit contained 134 acres. By 1958, farm operators had doubled their beginning farm size to 267 irrigated acres.

The sample of 56 North Unit operators represented a total of 83 acquisitions, or an average of 1.48 parcels of land per operator. After 10 years of project operation, only half the original operators remained on the project. Of these, 45 percent had added additional units to their operations.

Farm Production

Survey data were obtained for acreages and yields of crops grown in 1957. Crops grown the previous two years were recorded also. Inspection of records indicated that most common rotation for the 56 sample farms was 3 years alfalfa, 2 years grain, and 1 year potatoes.

Other cropping rotations determined from the field schedules were:

3 years alfalfa	3 years alfalfa
2 years potatoes	3 years grain
1 year grain	
1, 2 or 3 years legumes for seed	4 years Merion bluegrass for seed
1 year potatoes	1 year potatoes
1 year grain	1 year grain

Three-fifths of the farmers surveyed owned livestock. Feeder cattle were reported on 41 percent of the farms, dairy cows on 18 percent, ewes on 9 percent, and beef cows on 5 percent. Livestock income made up 16 percent of the 1957 average gross income of \$23,752. The average livestock sales for 25 farms reporting livestock income was \$8,772. Three farmers had more livestock than crop income.

More than half the average crop income of \$19,836 per farm was from potatoes. One-fourth of the income was from grains, with wheat comprising 80 percent of this income. About 10 percent of the income was from seeds, and 6 percent was from peppermint oil.

Median net farm income for farmers surveyed was about \$6,000. Range of incomes was very great, with the two lowest averaging a minus \$3,500 and the two highest over \$50,000. Average farm income was \$8,400 for the average size farm of 152 acres.

Average net farm income for the 30 to 89.9 acre farms was \$1,198. The highest three farms in the 30 to 89.9 acre group averaged \$4,400 above operating costs and depreciation.

On medium-sized farms of 90 to 160 acres, average income was \$6,059, with a range from minus \$3,500 to over \$14,000. Five operators had more than \$10,000 net farm income while at the low end of the scale, eight had net farm incomes of less than \$4,000.

Average net income on farms of more than 160 irrigated acres was a substantial \$19,461. However, large size did not guarantee a large income. On five farms incomes were less than \$3,000. One of these farms had \$2,000 income. By contrast, four returned incomes of more than \$30,000.

The two largest farms had the highest net incomes and ranked first and third in average net income per acre. They also had the greatest numbers of feeder cattle. However, after the two largest farms, the direct relationship between size and income no longer held. The eighth largest farm ranked second in returns per acre and fourth in total income. By contrast, the third largest farm ranked ninth in per acre returns and fifth in total income. Size of farm, livestock program, cropping program, land quality, and management were important factors influencing net farm income.

In order to make income comparisons between areas and farm size, farm budgets were prepared using production practices, average yields, prices, and inputs as found by the farm survey.^{1/}

Three farm sizes that represented the range of sample farms in each size class were selected:

60 acres.....	30 to 89.9 acre size class
140 acres.....	90 to 160 acre size class
240 acres.....	160 acres and over size class

Table 4 summarizes costs and income for different areas and size groups. The Agency Plains area was combined with the Metolius-Culver area because there was no significant difference between inputs and yields for the two areas. A residual to labor and management was obtained by subtracting from net income a 6 percent charge for machinery investment and a 5 percent charge for capital invested in land, buildings, and improvements.

If a farmer owned all of his capital, charge for capital would be income available for the family expenses or reinvestment. If he had machinery, equipment, or real estate debts, part of the capital charge would need to be paid as interest on his debts. If he were a renter, capital charge on the land would be paid as rent to the owner of the land.

^{1/} For complete details, see Conklin, Frank S. Factors contributing to the success and failure of farmers in the North Unit Deschutes Irrigation District, Jefferson County, Oregon. Master's thesis. Corvallis, Oregon State College, 1959. 101 numbered leaves.

Table 4. Budgets for Three Farm Sizes, North Unit Project, 1957.

Item	Agency Plains and Metolius - Culver Areas			Mud Springs Area		
	60 acres	140 acres	240 acres	60 acres	140 acres	240 acres
Acres						
Alfalfa	30	70	120	30	70	120
Potatoes	10	23	40	10	23	40
Wheat	15	15	15	15	15	15
Barley	5	32	65	5	32	65
Capital Investment						
Irrigated land	\$15,000	\$35,000	\$60,000	\$15,000	\$35,000	\$60,000
Buildings	2,320	2,600	6,350	2,320	2,600	6,350
Improvements (leveling)	1,500	3,500	6,000	--	--	--
Machinery & equipment	6,400	11,700	23,900	6,200	10,300	23,050
Total	\$25,220	\$52,800	\$96,250	\$23,520	\$47,900	\$89,400
Production						
Alfalfa	126 T	294 T	504 T	126 T	294 T	504 T
Potatoes	180 T	414 T	720 T	160 T	368 T	640 T
Wheat	840 bu.	840 bu.	840 bu.	840 bu.	840 bu.	840 bu.
Barley	350 bu.	2240 bu.	4550 bu.	300 bu.	1020 bu.	3900 bu.
Sales						
Alfalfa	\$1,953	\$4,557	\$7,812	\$1,953	\$4,557	\$7,812
Potatoes	4,311	9,915	17,244	3,832	8,814	15,328
Wheat	1,747	1,747	1,747	1,747	1,747	1,747
Barley	344	2,204	4,477	295	1,889	3,838
Total	\$8,355	\$18,423	\$31,280	\$7,827	\$17,007	\$28,725
Expenses						
Variable costs						
Labor - monthly	\$ --	\$ --	\$ 1,500	\$ --	\$ --	\$ 1,500
- hourly	105	132	1,504	105	132	1,356
Custom work	1,627	2,658	--	1,527	2,428	378
Machine rentals	97	225	70	80	184	--
Fertilizer	627	1,457	2,508	496	1,152	1,984
Seed	460	1,016	1,732	460	1,016	1,732
Crop supplies	60	432	744	--	294	504
Irrigation water charge	334	779	1,336	334	779	1,336
Gas, oil & grease	310	610	1,035	300	570	1,005
Potato sorting, weighing, inspection	1,080	2,484	4,320	960	2,208	3,840
Interest on operating capital	60	130	265	60	130	265
Fixed Costs						
Overhead 1/	162	202	298	162	202	294
Vehicle licenses	16	32	52	16	32	52
Insurance - vehicle, property, liability	112	120	262	112	120	262
Taxes - real estate & personal	274	567	1,049	271	559	1,037
Repairs - building /prop.	46	52	127	46	52	127
machinery	256	468	956	248	412	922
Noncash Costs						
Depreciation - machinery	539	1,071	2,168	526	939	2,125
building	58	66	159	58	66	159
Total expense	\$6,223	\$12,501	\$20,085	\$5,761	\$11,275	\$18,878
Net farm income	\$2,132	\$ 5,922	\$11,195	\$2,066	\$ 5,732	\$ 9,847
Less return for capital investment	\$ 1,203	\$ 2,557	\$ 4,644	\$ 1,118	\$ 2,354	\$4,300
Return to labor & management	\$ 929	\$ 3,365	\$ 6,551	\$ 948	\$ 3,378	\$5,547

1/ Electricity, telephone, office expenses, market information, and Social Security

Budgeted crop income to farms of the same size was about the same in both areas. However, because of lower yields of potatoes and barley, net income in the Mud Springs area was about 3 percent less for the 60- and 140-acre farms and 12 percent less for the 240-acre farm.

Small farms as represented by the 60-acre farm budget returned about \$2,100 to capital, labor, and management. Even a full owner without debt may be unwilling to subsist on such a low income.

Farm budgets for 140 acres of irrigated land showed about \$5,800 net farm income above operating and depreciation expenses. This income would be adequate for many farm operators; for others, it would not. For example, a tenant farmer's income would be reduced by nearly \$2,000 assuming rental charges equal to 5 percent on the landlord's real estate holdings. In addition, interest payments on capital loans could reduce available income to an owner-operator up to \$600. The remaining income of \$3,200 would need to be distributed between capital expenditures for both home and farm, any savings or personal insurance, and family living expenditures.

Farm budgets for the 240-acre size farms showed net incomes of \$11,195 and \$9,747 for the two area groups. Deducting a charge for capital, returns to labor and management amounted to \$6,551 and \$5,447.

Off-farm Income

The budgets and survey both demonstrated that many farmers had inadequate net farm incomes to achieve their desired goals. However, North Unit farmers had several other sources of income in addition to farm income from the project. Farmers on the 30 to 89.9 acre farms had \$4,012 nonproject income, nearly four times as much as their incomes from farming project lands. Farmers with more than 90 acres averaged about \$2,000 nonproject income (Table 5).

Table 5. Sources and Average Dollars of Income per Farm, by Farm Size, North Unit Deschutes Project, Oregon, 1957

Item	30 to 89.9 acres	90 to 159.9 acres	Over 160 acres
Nonproject income:			
Dryland farming-----	\$ 48	\$ 17	\$ 112
Land rental-----	587	502	615
Off-farm work:			
Operator-----	2,185	694	591
Family-----	770	131	63
Other income-----	422	641	657
Total-----	<u>\$4,012</u>	<u>\$1,985</u>	<u>\$ 2,038</u>
Net farm income-----	<u>1,198</u>	<u>6,059</u>	<u>19,461</u>
Total family income--	<u>\$5,210</u>	<u>\$8,044</u>	<u>\$21,499</u>

The most important source of nonproject income was from off-farm work. The average income per farm unit for the operator and family was \$1,456, of which \$1,142 was earned by the operator.

Table 6. Off-farm Employment by Farm Families, North Unit Deschutes, Project, Oregon, 1957.

	30 to 89.9 acres		90 to 159.9 acres		Over 160 acres	
	No.	Average days	No.	Average days	No.	Average days
Operator:						
Farm labor-----	7	116	5	24	2	54
Other labor-----	6	128	2	72	3	129
Other-----	2	225	2	77	-	-
Family:						
Other labor-----	5	109	1	60	1	90
Other-----	3	237	1	180	-	-
Total persons ----	23	141	11	57	6	97
Farms-----	18		21		17	

Farm families on small units averaged nearly six times as many days of off-farm work as did families on medium-sized and large farms. In only one instance was neither the operator nor a family member working off the farm in the under 90-acre size group. Five operators and three family members held full-time off-farm jobs. Only one operator and one family member on farms of over 90 acres held full-time, off-farm jobs.

Twenty-nine (52 percent) of the operators worked off the farm. Twenty-five operators worked as laborers (14 farm and 11 nonfarm). Five operators had off-farm income from nonlabor employment. ^{1/} The 29 operators averaged 101 days off-farm employment.

None of the 11 family members who worked off-farm performed farm labor. They were employed at such jobs as potato sorters, store clerks, and office workers. They averaged 144 days per year on the job.

The survey indicated that small-scale farmers not only needed supplementary off-farm income but also that they were able to obtain off-farm employment. Nearly half of the off-farm job opportunities for operators was labor on other North Unit farms.

Farm Investment

Average investment per farm operating unit has increased steadily since the beginning of the project. Average investment increased from \$13,446 in

^{1/} Nonlabor employment refers to those not working as laborers, as, for example, insurance salesmen or school teachers.

1948 to \$51,680 in 1958, a more than fivefold increase (Table 7). Contributing factors to this large increase included: (1) average increase in size of 71 acres per operating unit; (2) higher prices for machinery, equipment, and building materials; (3) increasing land values; and (4) more livestock on each farm.

Average investment for each irrigable acre increased from \$166 in 1948 to \$340 in 1958. About 50 percent of the increase resulted from a higher land price. Farmers who obtained their land as unimproved dryland had the lowest purchase price but the highest land improvement costs. The reverse was true for farmers who bought completely developed units after the project had been in operation for several years.

Table 7. Average Investment per Farm and per Acre by Size of Farm, North Unit Deschutes Project, Oregon, 1948 and 1958

Item	All farms		1958 Farms by size		
	1948 ^{1/}	1958	30-89.9 acres	90-159.9 acres	Over 160 acres
Acres per farm-----	81	152	63	135	267
Total Investment:					
Per farm-----	\$13,466	\$51,680	\$26,334	\$45,765	\$84,906
Per acre-----	166	340	418	330	318
Investment per acre					
Land-----	44	142	128	153	134
Residence-----	34	40	116	37	23
Farm buildings-----	8	38	44	45	34
Machinery & equipment	66	84	99	76	85
Livestock-----	14	36	31	28	42

^{1/} Van Winkle, Alfred E. Capital used in the development of newly irrigated farms on the North Unit Deschutes Project, Oregon. Master's thesis. Corvallis, Oregon State College, 1950. P. 27.

Land-purchase prices ranged from zero for two homesteaders to \$300 an acre for top-quality land bought after 1954. Buyers of unimproved project land had paid the Bureau of Reclamation's appraised price, the maximum being \$23 per acre for class I irrigable land. The much higher land-purchase price prevailing in the midfifties reflected not only the general rise in land values but also the original owner's investments in such land improvements as irrigation systems, leveling, stock ponds, fencing, and permanent legume and grass stands. Average land purchase price was \$28 for 1948 and \$117 for 1958 owners (Table 7).

The farmer's net worth or equity in his operation is an indicator of the financial strength of the operation; whereas the change in equity measures growth of the farm operation over time. Net worth for 1958 was determined by summing the assets per operator and deducting the intermediate and long-term debts. Annual loans were not considered debts against assets but operating debts secured by production. Therefore, they were not deducted from asset values. Beginning net worth was the total equity owned by the operator at the time he began project farming. Not all farmers showed an

increase in net worth from their first year of operation to 1958, but the average change over the 7.9 years was an increase of \$22,300 per farmer. Table 8 shows the asset and debt situation for farm operators.

Table 8. Average Dollar Equities of North Unit Deschutes Project, Oregon, Farmers, by Farm Size, 1958

Item	30-89.9 acres	90-159.9 acres	Over 160 acres
Investment:			
Land-----	\$ 6,769	\$13,846	\$27,275
Buildings-----	8,439	8,953	11,452
Machinery-----	6,255	10,300	22,725
Livestock-----	<u>1,950</u>	<u>3,765</u>	<u>11,087</u>
Total-----	\$23,413	\$36,864	\$72,539
Debt ^{1/} -----	\$ 3,827	\$ 5,597	\$ 4,126
Net worth:			
1958-----	\$19,586	\$31,267	\$68,413
Beginning-----	<u>19,547</u>	<u>14,055</u>	<u>16,556</u>
Increase-----	\$ 39	\$17,212	\$51,857

^{1/} Average intermediate and long-term debts.

Farmers on small units did not accumulate any equity on the average. Those on the medium-sized farms more than doubled their beginning net worth although they started with \$5,000 less than small farm operators.

Although farmers in the largest size farm group started with \$3,000 less in net worth than the small farm size group, they quadrupled their equity in an average of 7.9 years on the project (Table 8). These farmers increased their equity from \$16,556 to \$68,413, an average of \$6,560 a year.

The initial investment decision was a crucial element for success or failure. Several settlers with large amounts of assets bought complete farms and sets of equipment, with their farm size limited by the amount of cash they had available. Subsequently, they did not acquire sufficient funds to expand or perhaps had no desire to do so. Others with fewer beginning assets rented land or bought on credit and were able to acquire larger operating units. Importance of renting for larger operations is brought out by comparing the percentage of operators renting land in each size group: small, 11 percent; medium, 33 percent; and large, 71 percent.

Use of Credit

Credit has been an important factor in the development and operation of project farms. Comparing 1948 and 1958, average debt per farm was fairly constant, \$6,850 compared with \$6,123, but type of credit used changed from

primarily real estate and chattel loans to annual operating loans. Forty percent of the operators had no debt of any kind at the end of 1957. The credit situation is summarized in Table 9.

Table 9. Average Annual Dollars of Credit Used, Sample of North Unit Deschutes Project, Oregon, Farmers, 1957

Term	All Farms	30 to 89.9 acres	90 to 159.9 acres	Over 160 acres
Short-term credit:^{1/}				
Beginning----	\$1,946	\$ 817	\$2,705	\$ 2,208
New-----	7,617	1,302	6,815	15,294
Ending-----	1,542	730	1,905	1,953
Paid off-----	8,021	1,389	7,615	15,549
Intermediate-term credit:^{1/}				
Beginning----	\$ 829	\$ 650	\$ 316	\$1,177
New-----	105	122	0	212
Ending-----	515	583	219	806
Paid off-----	419	189	97	583
Long-term credit:^{1/}				
Beginning----	\$2,906	\$2,224	\$4,270	\$1,941
New-----	1,249	1,194	1,190	1,390
Ending-----	4,067	3,244	5,378	3,331
Paid off-----	88	174	82	0

^{1/} Short-term, less than 1 year; intermediate-term, 1 to 3 years; long-term, over 3 years.

Personal Characteristics of Farmers

A farmer's ability to adjust to changing conditions is dependent upon many things including personal characteristics, such as age, health, education, prior farm experience, and family, as well as financial and physical factors. The wide variation in personal characteristics and the small number of farmers surveyed prevented obtaining statistically significant relationships between personal characteristics and farm success.

Farmers on larger units tended to be younger and have larger families. Median age for farmers on the largest units was 40 years, 6 years less than for operators of small farms, and 12 years less than for operators of medium-sized farms. Median age for all project farmers surveyed was 46 years. Families on large units averaged one child more than those on small units, 2.4 compared with 1.4. Thirty-nine percent of the families had three or more children at home while one-fourth had none.

There was no apparent relationship between years of education and size of farm operated. Half of the operators were high school graduates, 13 attended college, and 6 were college graduates. Two farmers had attended school less than 8 years, and 16 had 8 years of schooling.

The survey did not indicate any relationship between previous occupational experience and successful farm operation. Only 42 percent of the settlers had previously operated a farm. Their average project farm income was about the same as those without farm operation experience. Operators with previous business or farming success were generally successful on the North Unit Project. In some instances, success could not be measured by size of farm or income. Several older farmers had stabilized their operations and were not trying to increase either acreage or other farm investments. As a group, project farmers were comparatively young and well educated. They were a group of people willing to try new enterprises and methods of farming to adjust to changing conditions.

FARM BUDGET ANALYSIS

Information obtained in the field survey indicated that some farmers were not earning adequate incomes. Two important reasons for this situation were small farm size and inefficient organization of farm resources. Farm size was limited by availability of suitable land for expansion, by reluctance of farmers to acquire additional land in view of uncertain profits and by amount of operator labor and capital available.

Adequate harvest labor was available for hire in the North Unit. In addition, some family labor was available in summer. Large farms had one or more full-time hired laborers. Farmers on average or smaller farm units found it difficult to hire a man for summer only, and they could not utilize a hired man for the whole year. Unless a farmer had a farm large enough to utilize a second man full time, he preferred to operate only as many acres as he could handle with hired labor during harvest periods.

Another factor that can limit farm size and income is amount of operating capital available to the operator. Survey data indicated that average size farms of 152 acres used about \$12,600 operating capital. In appraising effect of limited operating capital on farm size and income, the average of \$12,600 was assumed to be the maximum available to the operator.

After farm sizes with limited labor and capital were found for selected farm organizations, it was possible to determine marginal value of an additional unit of each of the limiting factors. Marginal value was the increase in income resulting from using one more unit of the limiting factor after subtracting additional cost of production incurred with use of the additional unit.

Farm analysis was based on budgets prepared from data obtained in the field survey. Four different rotations were analyzed. Fixed costs were calculated for modal farms representing small, medium, and large-scale operations. Variable costs, returns, and labor requirements were calculated for one acre of each of the four rotations. Size of farm with limited labor or operating capital was calculated by dividing the quantity of resource assumed available by the resource requirement per acre. It was assumed that variable factors were combined in a fixed proportion with land and that output per acre was constant.

Modal farm organizations with current rotations are illustrated in Table 4. Labor requirements and incomes were also developed for five alternative rotations on farms with 60, 140, and 240 irrigated acres (Table 10). Current production practices and average yields and prices for 1957 were used in preparing these budgets. Complete budgets were prepared for the three farm sizes with a basic rotation of 3 years alfalfa, 1 year potatoes, and 2 years grain. Other combinations were compared with the basic rotation in terms of labor requirements and income per acre.

Prices received for potatoes, alfalfa, and grass seed in 1957 were low compared with those in previous years and with the following years, while prices for grain dropped after 1957 (Table 11). These price changes greatly

Table 10. Variable Net Returns Per Acre and Monthly Labor Requirements, Irrigated Farms, by Size and with Alternative Crop Rotations, North Unit Deschutes, Oregon Project, 1957.

Rotations:	1			2			3			4			5		
	3 years alfalfa 1 year potatoes 2 years grain 1/			3 years alfalfa 2 years potatoes 1 year grain			2 years Kenland red 1 year potatoes 1 year grain			4 years Merion blue 1 year potatoes 1 year grain			3 years alfalfa 3 years grain		
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Size of operating unit:	60 irrigated acres			60 irrigated acres			140 irrigated acres			140 irrigated acres			240 irrigated acres		
Rotation:	1			2			3			4			5		
Agency Plains & Metolius-Culver Areas	\$63.10 \$76.30 \$82.90 \$82.90 \$64.70 \$46.00			\$62.10 \$78.00 \$83.00 \$61.80 \$46.40			\$72.80 \$100.00 \$97.00 \$76.10 \$45.60								
Variable net returns/acre 2/															
Labor requirements by month in terms of hours/acre															
January	.08	.08	.08	.32	.08	.08	.08	.08	.32	.08	.08	.08	.08	.32	.08
February	1.09	1.08	.82	.46	1.55	.68	.68	.54	.28	.96	.68	.68	.68	.54	.28
March	.51	.41	.46	.31	.60	.45	.37	.40	.28	.52	.42	.35	.38	.26	.48
April	.80	.85	.83	.92	.75	.80	.85	.60	.77	.75	.80	.85	.63	.92	.75
May	1.13	1.36	1.24	.84	.88	1.13	1.36	1.24	.84	.88	.85	1.08	1.24	.84	.88
June	1.14	1.45	.82	1.02	.83	1.06	1.37	.82	1.82	.75	.96	1.27	.82	1.48	1.30
July	1.13	1.36	.55	.23	.90	1.54	1.46	1.01	.54	1.62	1.07	1.11	.79	.43	1.96
August	.04	.07	.34	.33	.93	.04	.07	.94	.27	.04	.04	.07	.68	.25	.04
September	.34	.68	.51	.67	.67	.34	.68	.51	.67	.67	.33	.66	.50	.66	.04
October	.68	.68	1.02	.68	.68	.68	.46	.70	.46	.46	.46	.46	.70	.46	.46
November															
December															
Mud Springs Area															
Variable net returns/acre	\$61.40 \$73.00 \$79.10 \$62.10 \$45.40			\$59.10 \$74.10 \$73.40 \$63.60 \$44.20			\$67.30 \$91.90 \$88.70 \$70.80 \$42.70								
Labor requirements by month in terms of hours/acre															
January	.08	.08	.08	.32	.08	.08	.08	.08	.32	.08	.08	.08	.08	.32	.08
February	1.09	1.08	.82	.46	1.55	.68	.68	.54	.28	.96	.68	.68	.68	.54	.28
March	.51	.51	.54	.31	.60	.47	.42	.44	.30	.52	.42	.35	.38	.26	.48
April	.80	.85	.83	.92	.75	.80	.85	.60	.77	.75	.80	.85	.63	.92	.75
May	1.13	1.28	1.31	1.68	1.38	1.33	1.28	1.31	1.68	1.38	1.33	1.28	1.31	1.68	1.38
June	1.52	1.97	1.74	1.39	1.06	1.38	1.83	1.75	1.39	.92	1.24	1.69	1.75	1.39	.78
July	1.68	2.13	1.46	1.67	1.46	1.59	1.99	1.39	2.41	1.18	1.54	1.99	1.46	2.12	1.08
August	1.59	2.05	1.07	.46	1.34	2.00	2.15	1.53	.77	1.85	1.53	1.80	1.36	.66	1.27
September	.08	.15	.40	.37	.67	.08	.15	1.00	.31	.08	.15	.74	.29	.08	.08
October	.34	.68	.51	1.01	.67	.34	.68	.51	1.01	.67	.33	.66	.50	1.00	.04
November	.57	.57	.86	.57	.57	.57	.34	.34	.52	.46	.34	.34	.52	.34	.34
December															
Point where monthly labor becomes limiting in terms of hours/acre 3/	250 (hours) / 60 (acres) = 4.17			250 (hours) / 140 (acres) = 1.78			250 (hours) / 240 (acres) = 1.04								

1/ Current rotation assumed in table 4 includes a combination of wheat and barley based upon the proportion of each crop grown. A 15 acre restriction was placed on wheat because of government allotments.

2/ Determined by subtracting variable expenses from gross receipts. Variable expense items include: fertilizer, seed, crop supplies, irrigation water, gas, oil, grease, custom work, machine rental, potato inspection and grading, seed cleaning, and labor. Hired labor is included when an operation requires more than one person or when operations overlap causing simultaneous operations to be performed.

3/ This assumes one operator is available 250 hours per month.

Source: Conklin, Frank S., and Emery N. Castle. "Adjustment Possibilities on Irrigated Farms in Jefferson County, Oregon." Ore. Agr. Expt. Sta. Misc. Paper #100, 1960.

Conklin, Frank S. "Factors Contributing to the Success and Failure of Farmers in the North Unit Deschutes Irrigation District, Jefferson County, Oregon. M. S. thesis, Oregon State College, 1959.

affected returns for the several budgets considered previously. Average prices from 1957 to 1959 were used in preparing alternative budgets for comparison with those based on 1957 prices.

Yields of crops varied considerably among project farmers. It was assumed that farmers could attain yields as high as the average for the highest one-third of the farmers surveyed under better than average managements. These yields are compared with average yields in Table 11. High-level yields were combined with average prices obtained in the 1957-59 period to prepare budgets illustrating the higher level of achievement possible on the North Unit. This level of prices, yields, and income is referred to as "level 1" in Table 11; "level 2" was average 1957 conditions. Although prices for wheat and barley were lower under level 1, the higher yields more than compensated. As a result, net returns to grain were 20 percent higher under level 1 than level 2 conditions; net returns to alfalfa doubled, and returns to Merion bluegrass nearly tripled; net returns to potatoes increased about 75 percent.

In recent years production of mint has become a major source of income in the area. At the time of the survey, mint was not widely grown in the area. However, subsequent developments have led some people to believe that it may eventually replace potatoes as a cash crop in the area. In 1961, approximately 4,000 acres of mint were grown in the area; as much as 5,500 acres may be grown in the area in 1962.

Farm Size When Limited by Labor

Crops were combined into the four rotations shown below and were compared in terms of variable costs, net income above variable costs, and maximum acreage for an operation limited to operator labor, which was assumed to be 250 hours per month.

Each rotation has different monthly labor requirements (Table 10). The peak labor months occur during harvest and first irrigation settings. Rotation 1 requires 1.54 hours per acre during August which restricts a one-man operation to 162 acres; the May labor requirement of 1.24 hours restricts rotation 2 to 201 acres; the July requirement of 1.82 hours limits rotation 3 to 137 acres; and August requirements of 1.62 hours limits rotation 4 to 154 acres. The acreage of each crop grown in the four rotations is shown in Table 12.

Rotation 1:

3 years alfalfa
1 year potatoes
2 years grain

Rotation 3:

4 years Merion bluegrass
1 year potatoes
1 year grain

Rotation 2:

2 years Kenland red clover
1 year potatoes
1 year grain

Rotation 4:

3 years alfalfa
3 years grain

Table 11. Budgeted Income and Variable Costs per Acre, Selected Crops with Two Yield and Price Levels, North Unit Deschutes Project, Oregon

Item	Alfalfa	Potatoes	Wheat	Barley	Merion bluegrass	Kenland red clover
Yield:						
Upper 1/3	5.1 T.	20 T.	75 bu.	90 bu.	250 lbs.	300 lbs.
Av. yield	4.2 T.	18 T.	56 bu.	70 bu.	150 lbs.	250 lbs.
Prices per unit:						
1957-59 av.	Dollars 20.00	Dollars 28.00	Dollars 1.80	Dollars .893	Dollars .97	Dollars .32
1957	15.50	23.95	2.08	.984	.70	.30
Gross returns:						
Level 1 <u>1/</u>	102.00	560.00	135.00	80.37	242.50	96.00
Level 2 <u>2/</u>	65.10	431.10	116.48	68.88	105.00	75.00
Variable cost						
Level 1	33.90	309.70	23.34	20.94	80.48	19.43
Level 2	30.91	287.70	22.39	19.99	60.48	17.93
Net returns:						
Level 1	68.10	250.30	111.66	59.43	162.02	76.57
	34.19	143.40	94.09	48.89	44.52	57.07

1/ Average of 1957 to 1959 prices and average yield of upper 1/3 farms

2/ 1957 prices and average yield.

Table 12. Budgeted Crop Acreage and Variable Costs and Income for Selected Rotations with Operator's Labor Limited to 250 Hours per Month, North Unit Deschutes Project, Oregon.

	Acres	Variable costs		Income above variable costs	
		Level 1 <u>1/</u>	Level 2 <u>2/</u>	Level 1 <u>1/</u>	Level 2 <u>2/</u>
Rotation 1:					
Alfalfa	81	\$2,746	\$2,504	\$5,516	\$2,769
Potatoes	27	8,362	7,768	6,758	3,872
Wheat	36	840	336	4,020	1,411
Barley	<u>18</u>	<u>577</u>	<u>780</u>	<u>1,069</u>	<u>1,907</u>
Total	162	12,525	11,388	17,363	9,959
Rotation 2:					
Red clover	100	1,943	1,793	7,657	5,707
Potatoes	50	15,485	14,385	12,513	7,170
Wheat	34	794	336	3,796	1,411
Barley	<u>17</u>	<u>356</u>	<u>720</u>	<u>1,010</u>	<u>1,760</u>
Total	201	18,578	17,234	24,976	16,048
Rotation 3:					
Bluegrass	91	7,324	5,504	14,744	4,051
Potatoes	23	7,123	6,617	5,757	3,298
Wheat	15	350	336	1,675	1,411
Barley	<u>8</u>	<u>168</u>	<u>160</u>	<u>475</u>	<u>391</u>
Total	137	14,965	12,617	22,651	9,151
Rotation 4:					
Alfalfa	77	2,610	2,380	5,244	2,633
Wheat	51	1,903	336	5,695	1,411
Barley	<u>26</u>	<u>544</u>	<u>1,240</u>	<u>1,544</u>	<u>3,031</u>
Total	154	5,057	3,956	12,483	7,075

1/ Yields obtained by upper 1/3 of farmers surveyed and average prices received from 1957 to 1959; wheat comprised 2/3 of the grain acreage.

2/ Average yield and prices; wheat limited to 15 acres.

Net income above variable costs for the four rotations increased from 50 to more than 100 percent with high levels of management and 1957 to 1959 average prices, as compared with average 1957 yields and prices. Highest income above variable costs, \$24,976, was obtained from rotation 2, clover, potatoes, and grain. Income to alfalfa and grain, rotation 4, was only half as much as income to rotation 2. The bluegrass rotation, number 3, was second highest with \$22,651 income above variable costs. The basic rotation, number 1, was third most profitable, with income above variable cost of \$17,363.

Fixed expenses were similar for the four rotations. The farms were similar enough in size to permit operators to use the same equipment and buildings assumed for rotation 1--the basic rotation presented in Table 4. Potato-harvesting equipment was supplied by custom operators. Fixed expenses were the same for average as for above-average operation. Returns above variable costs minus fixed expenses with operator labor limited to 250 hours per month for the two levels and four rotations were as follows:

<u>Rotation</u>	<u>Level 1</u>	<u>Level 2</u>
1	\$14,649	\$ 7,245
2	21,963	13,033
3	20,009	6,590
4	9,818	4,410

Since operator labor limited size of these farms, larger farms would require hired labor or additional family labor. Return for an additional acre would equal net return minus labor charge, real estate tax, and additional repairs. For example, rotation 1 had a net income above variable cost of \$107 per acre. Costs for an additional acre would be: labor \$2.50, property tax \$2.80, and repairs \$3.35. Net return to the additional acre would then equal about \$98 for level 1 returns and \$52 for level 2 returns.

If net return for an additional acre of land were imputed as return to labor, dollar earnings of an additional hour of labor for the four rotations and two levels would be as follows:

<u>Rotation</u>	<u>Level 1</u>	<u>Level 2</u>
1	\$ 56	\$ 26
2	85	49
3	80	26
4	39	17

A capital charge of \$12.50 for one acre of land was subtracted from net returns; no charge for labor was deducted. Additional labor would be profitable for all four rotations at both levels.

At some acreage between 140 and 240, the set of equipment assumed for the budgets above would need to be increased and costs used would be inappropriate. Farm budgets of 140 acres required \$11,700 invested in equipment; budgets for 240 acres had equipment costing \$23,050.^{1/} The increase was due to a second tractor, potato planting and harvesting equipment, self-propelled combine, hay baler and loader, and a 2-ton truck. On smaller farms, this additional equipment was custom hired or rented when needed.

^{1/} Conklin, op. cit. pp. 93-94.

Rotation 1 was budgeted for 140 and 240 acres, as shown in Table 4. Net income was \$5,922 for 140 acres, and \$11,195 for 240 acres with average management and 1957 prices. Average net return for the 100 acres between 140 and 240 acres was \$52.73, which is very close to the \$52 calculated above for net return to one additional acre.

Farm Size When Limited by Operating Capital

The previous budgets showed maximum acreage and income obtained from four rotations when farm acreage was limited by operator's labor. Operating capital requirements limited each of the four rotations to different maximums than did labor requirements presented above. With operating capital limited to \$12,600 and level 1 prices and yields, maximum acreages and returns would be as follows:

<u>Rotation</u>	<u>Acres</u>	<u>Income above var. costs</u>	<u>Return per dollar expenses</u>
1	166	\$17,762	\$1.41
2	137	16,851	1.33
3	115	18,975	1.51
4	382	1/	2.57

The highest income was obtained by rotation 4 with the highest return per dollar expenses, \$2.57. Average operating capital would allow rotation 4 to be expanded to more than 300 acres, while operator's labor restricted it to only half as many acres.

Rotations 2 and 3 were restricted more by the average operating expenditure limitation than they were by operator's labor. Rotation 1 was practically the same size under both restrictions. Rotation 2 required the most operating capital per dollar income. Consequently, income above variable cost for rotation 2 was the smallest of the group while with the labor restriction, it was the highest.

Rotation 3 had the highest operating expenditure per acre and so was limited to the smallest acreage of the group. Net variable income per acre for rotation 3 was higher than for 1 and 2. As a result, on the smallest acreage, rotation 3 had the highest total income above variable costs.

If additional operating capital could be obtained along with land and labor, percentage return on operating capital would be as follows:

<u>Rotation</u>	<u>Level 1</u>	<u>Level 2</u>
1	112	57
2	111	70
3	131	50
4	188	104

Additional taxes, repairs, labor, and a 5-percent charge for land investment was deducted from net income for one additional acre. The remaining net income was imputed as a residual of operating capital. The residual divided by the amount of operating capital used per acre gave the percentage return.

1/ Cost data were not applicable to farms over 240 acres.

The high returns indicated that it would be profitable to add additional acres for the four rotations at both levels of prices and yields.

The analysis of returns from additional crop acreage is especially applicable to farmers on small units of less than 90 acres. Having excess labor and machinery, they could add 40 to 80 acres provided the additional acreage could be obtained and operating capital was available. Their incomes would be increased to levels indicated above under good management.

Livestock Programs

It has been shown that farms of average size could profitably be increased by adding more acres. In many instances, however, land buying would be impossible since land may not be available close by, units for sale may be too large for the farmer to handle, or funds may not be available to the farmer. An alternative to buying land would be renting land, which also would be profitable. If land expansion is impossible, or if the farmer does not desire additional acreage, he can supplement his income by adding a livestock-feeding operation.

Livestock-feeding operations are well suited to the North Unit Project for several reasons. First, a large quantity of high-quality hay is produced on the project. Second, most farmers have excess labor in winter and small unit operators have labor available the year around. Third, crop residues such as cull potatoes, straw, bluegrass, and clover aftermath can be utilized profitably through cattle feeding.

About a third of the Project farmers fed cattle in 1957. Seven fed yearlings and 12 fed calves. All except three fed to slaughter weights. Prices paid for cattle ranged from \$18 to \$24 per hundredweight. Selling prices for slaughter cattle ranged from \$22 to \$26 a hundredweight. Table 13 presents a typical feeding program for calves and yearlings, using average prices paid and received in 1957. Farm price of hay and grain was charged to the feeding enterprises as a cost. Grinding, mixing, and additives cost \$3.10 per hundredweight of grain. Feed cost per 100 pounds of gain amounted to \$12.63. Since farm price of alfalfa was \$20 per ton and grain was \$39 per ton, this cost was relatively low. Net returns above all costs, including interest on investment in livestock and facilities, amounted to \$40.43 for calves, and \$38.14 for yearlings (Table 13). Net income to livestock would be greater if part of the feeding program included cull potatoes or seed crop aftermath.

In order to add livestock, a farmer would need to have labor available and funds for livestock purchase, operating expenses, and investment in facilities for handling livestock. Livestock facilities would cost about \$35 per head.^{1/} If funds and labor were limited, a supplementary livestock program would become competitive with the crop program at certain sizes depending upon crop and livestock programs selected. If a farmer were to reduce his crop acreage in order to add livestock, his total profit would be reduced because returns to labor and capital of the four crop rotations were all greater than the livestock returns.

^{1/} Weisgerber, Pius. Organization and costs of cattle feeding in the Yellowstone Valley. Bozeman, 1960. 26 p. (Montana. Agricultural Experiment Station. Research Report No. 11, p. 19).

Rotation 1 was selected to illustrate possibility of fitting livestock to crop farms. It was assumed that yearlings were bought in October and fed through February. During this period, the number of livestock that one man could handle on the average size farm of 152 acres was limited by December labor, when he would have 180 hours of unutilized labor. The survey showed that one head of livestock requires approximately one man-day of labor per month. Therefore, the operator of an average size farm could handle 180 head of yearlings. With price-cost relationships assumed, such an enterprise would increase his net farm income by about \$6,800.

If a farmer fed calves for 10 months, the number he could handle would be limited by June labor. He would have enough extra labor in June to feed 78 calves. Net farm income would increase by about \$5,100.

Calves appear to be more profitable than yearlings per dollar invested with the prices assumed. A farmer on a smaller-than-average unit with limited operating capital probably would make more money raising calves than yearlings. For example, a typical farmer with 100 acres in rotation 1 with an average operating capital of \$12,600 could profitably use \$5,600 to buy 55 calves or 45 yearlings. Calves would return a net income of some \$2,200, while yearlings would return about \$1,600.

These examples show that addition of yearlings to a typical farm is more profitable than calves when labor is limited. On the other hand, if operating capital is the limiting factor, addition of calves will return a greater net income than yearlings.

OFF-FARM ADJUSTMENT OPPORTUNITIES

Farm consolidations over the first 10 years of project operation displaced nearly half the original owners. Also, in 1957 practically all the small farm operators worked off the farm. This study indicated that farm consolidations would continue in the future and that many people now on farms will require off-farm employment.

Development of the project led to increased business activity in the local community. More new jobs were available each year of project operation than there were farmers seeking off-farm employment. Because all the project lies within Jefferson County, county statistics were used to measure area growth stimulated by project development.

The entire State of Oregon experienced great economic progress after World War II. With or without an irrigation project, Jefferson County probably would have shown population, agricultural, and commercial growth. In order to delineate growth resulting from the North Unit Project, Deschutes and Crook Counties were selected for comparison.

These counties have much in common so far as natural resources and climate are concerned. However, Jefferson County differs in that it had a larger area of high-quality land suitable for irrigation, although irrigation was first developed in the other two counties. Similarities between the three counties make comparison of growth useful despite some differences in quality of land.

Table 13. Usual Costs and Returns per Head for Feeder Calves and Yearlings, 1957.

Item	Calves	Yearlings
Initial wt., lbs.	440	640
Cost per lb., dollars	.23	.20
Total cost, dollars	101.20	128.00
Ending wt., lbs.	1,100	977.5
Selling prices, dollars	.24	.24
Total value, dollars	264.00	234.60
Feeding period, days	300	150
Total feed:		
Hay, lbs. <u>1</u> /	2,804	1,950
Concentrate, lbs.	2,448	1,305
Cost of feed:		
Hay, dollars	28.04	19.50
Concentrate, dollars	55.33	29.49
Other costs <u>2</u> /, dollars	39.00	19.47
Total costs, dollars	223.57	196.46
Net return, dollars	40.43	38.14

1/ Back, W. B. Guides for dry-lot cattle feeders. Corvallis, 1960. 20 p. (Oregon Agricultural Experiment Station. Miscellaneous Paper 98. p. 6).

2/ Other costs include interest at 6 percent on value of cattle and 5 percent on facilities, depreciation and upkeep of facilities at \$8 per head, veterinarian and supplies \$1 per head, and death loss of 1 percent.

Creation of new farms in the North Unit Project attracted people from outside the vicinity of Jefferson County. Some obtained new, irrigated farm units, others came in as farm laborers, and most of the rest settled in the small town of Madras within the project boundaries. From 1944 to 1949, the period of project settlement, the county population more than doubled (Table 14).

The increase in population in the late forties was in sharp contrast to the situation in Jefferson County in the 1930's. Low farm income had caused abandonment of many farms, and population dropped by 10.7 percent. At that time, the economy of the county was primarily agricultural with 42 percent of the employed working in agriculture. There was no other source of industrial employment.

Table 14. Population Growth, Selected Counties, Oregon, Specified Years, 1940 to 1958.

Item	1940	1944	1949	1954	1958
<u>Jefferson County</u>					
Number	2,402	2,500	5,500	5,890	7,790
Decile change ^{1/}	-10.7	---	171.1	---	40.0
<u>Deschutes County</u>					
Number	18,631	19,600	21,700	21,700	19,850
Decile change	26.3	---	17.1	---	-9.0
<u>Crook County</u>					
Number	5,533	6,000	8,900	9,220	9,110
Decile change	65.9	---	62.5	---	1.3

Source: United States Census of Population and Oregon State Board of Census.

^{1/} Decile percentage changes are average changes over the 10 preceding years. The 1950 to 1960 change was estimated by projecting the first 8 years of the period.

Between 1930 and 1940, the neighboring counties of Deschutes and Crook had a population increase of 26.3 and 65.9 percent, respectively (Table 14). Their economy did not depend upon dryland farming. Also, they had larger communities and a lumber industry. These counties continued to grow in the 1940's but at a slower rate than in the 1930's.

Between 1954 and 1958 there was a loss in population in Deschutes and Crook Counties, while Jefferson County gained 55 percent. Part of this gain was due to immigration of new workers with their families. Few were farm workers or operators because farm population was declining during this period.

The increase in nonfarm workers in Jefferson County can be attributed directly to the irrigation development in the area. There was no other major industry in the area. Although lumbering employment increased from 11 to 179 in the 1940's, very little increase occurred after 1950.

Unlike the situation in Jefferson County, lumbering has played an important role in the change in employment in the other two counties. In Crook County, most of the 61-percent increase in employment came in the lumber industry during the 1947-58 period (Table 15). Deschutes County experienced a loss of 44 percent in lumber employment. Consequently, total employment in Deschutes County increased only 2 percent.

State employment statistics in Table 15 for the 1947-58 period show that the greatest increase in number of workers in Jefferson County was in

the wholesale and retail trades. Here, the increase of 188 employees accounted for more than a third of the total increase in county employment. Only eight people were employed in the service, finance, and real estate occupations in 1947. By 1958, there were 82. Employment in the construction industry increased by 52 persons, or 70 percent, during the 11-year period. Total nonfarm employment increased by 568 workers, or 185 percent, during the 1947 to 1958 period.

Table 15. Number of Workers Employed in Industries Covered by Unemployment Compensation, Selected Counties, Oregon 1/

Item	Total	Wood and lumber manufac- ture	Wholesale and retail trade	Construction	Finance, real es- tate, and service
<u>Jefferson</u>					
1947	307	139	66	74	8
1958	875	168	254	126	82
Percent change	185	21	285	70	925
<u>Deschutes</u>					
1947	3,717	1,805	824	198	406
1958	3,787	1,015	1,095	141	443
Percent change	2	-44	33	-29	9
<u>Crook</u>					
1947	1,072	592	231	63	136
1958	1,728	1,051	269	28	148
Percent change	61	78	16	-56	9

Source: "Oregon Covered Employment and Payrolls by Industries, County, and Month," Oregon State Unemployment Compensation Commission.

1/ Data are given for month of March.

In 1939, there were relatively few retail businesses in Jefferson County. By 1958, the number of retail establishments had more than tripled.

Comparing 1947 and 1958, volume of trade increased 150 percent in Jefferson County, while Crook County increased 56 percent, and Deschutes County increased only 2 percent (Table 16).

As a result of increased farm income from the North Unit Project, additional employment occurred in the tertiary industries, such as trade and services. At the same time, the proportion of persons employed in secondary industry, such as manufacturing, was decreasing. In 1947, 75 percent of the employment in secondary and tertiary industries was in the secondary industries. By 1957, only 47 percent of the employment was in

secondary industries. During the 1950's, employment in agriculture, a primary industry, was decreasing. These shifts in employment indicated that Jefferson County was maturing. Employment opportunities had shifted from primarily agricultural to trade and service industries.

Table 16. Retail Trade Establishments and Dollars of Trade, Selected Counties, Oregon Specified Years, 1939 to 1958.

County	Retail establishments	Dollars of trade	Change in dollars of trade
	<u>Number</u>	<u>Thousands</u>	<u>Percent</u>
<u>Jefferson</u>			
1939	32	561	
1947	60	3,854	587
1954	72	7,736	101
1958	99	9,594	24
<u>Crook</u>			
1939	55	1,498	
1947	87	6,625	342
1954	94	10,767	63
1958	105	10,348	-4
<u>Deschutes</u>			
1939	277	8,668	
1947	333	30,503	252
1954	339	27,611	-10
1958	300	31,014	12

Source: United States Department of Commerce, United States Census of Business.

FARMERS' VIEWS ON ADJUSTMENTS

Opportunities for adjustments in farming operations were explored earlier in the manuscript. In addition, growth of the business community indicated that job opportunities were available for farmers who desired off-farm work.

Some possible adjustment opportunities available to farmers were:

1. Increase size of farm operation by buying or renting land or by adding livestock.
2. Adjust present farm operation in respect to organization and practices.
3. Sell farm and work full time in the community.

4. Rent out farmland and work in the community.
5. Sell the farm and buy another in a different area.
6. Sell everything and move to an industrial area.
7. Older farmers may retire and live on social security and income from sale or rent of the farm.

Farmers surveyed were asked what adjustments they were willing to make. The results are summarized in Table 17.

Table 17. Adjustment Possibilities Reported by North Unit Deschutes Project, Oregon, Farmers, by Farm Size.

Item	Farm Size			Average Percent
	30-89.9 acres Percent	90-159.9 acres Percent	Over 160 acres Percent	
Would expand farm:	39	48	59	50
Increase crop	11	19	18	17
Increase livestock	28	29	41	33
Could finance 25% expansion:				
Use own funds	33	47	40	40
Borrow funds	87	94	100	93
Could borrow all funds desired	81	89	93	88
Source of funds:				
Bank	31	21	35	27
Prod. credit assoc.	0	26	29	19
Farmers Home Adm.	6	26	0	11
Several sources	25	11	14	15
Other	6	11	14	10
Would leave farm	61	29	59	45
Would sell farm	65	25	75	51

Only 17 percent of the farmers interviewed thought crop acreage expansion would be profitable while a third stated that livestock expansion would be profitable. In general, farmers on large units with higher-than-average incomes thought additional land or livestock could be managed profitably. Fifty-nine percent of the large-scale farmers would expand, compared with 39 percent of the small-scale farmers. Average 1957 farm income of expansion-minded farmers was \$11,638, while income for those not wishing to expand averaged only \$4,730.

Beef feeding was the livestock enterprise mentioned most often as a profitable addition to the farm operation. Two farmers thought dairying would be profitable but there was no market available for milk. Two other farmers believed that raising hogs would be profitable.

It is one thing to realize that expansion would be profitable but quite another for farmers to have the means and the willingness to accomplish the expansion. Expansion requires management skills; capital for land, equipment, and operating expenses; labor; and reliable markets. Low incomes found in the survey within the entire range of farm sizes suggested that some farmers were lacking in management ability. Others were unwilling to incur additional risks. Markets were not available for grade A milk. Price variability influenced some farmers not to expand into such crops as grass seed, clover seed, and mint. For some farmers, additional labor in the proper amount would be hard to obtain. And finally, expansion required financing.

Financing Expansion

Farmers were asked whether they could finance a 25-percent expansion if they knew it would be profitable. Forty percent said they could finance this expansion with their own funds. Only four farmers reported that they could not borrow for a profitable expansion. Although most of the farmers had not requested loans for expansion, it is clear that most of them did not think that a deficiency of funds would prevent profitable expansion.

Credit worthiness is sometimes considered directly proportional to size of farm or quantity of assets. Table 17 shows that 81 percent of the farmers on small units, and 93 percent of those on large units, reported that they could borrow all they desired. There appeared to be no significant difference between size groups in their confidence in their ability to borrow funds.

Farmers reported a wide variety of credit sources. The local bank was mentioned 21 times, the Production Credit Association 13 times, Farmers Home Administration 8 times. Eight farmers mentioned several sources and five mentioned sources other than those above. None of the farmers with farms smaller than 90 acres mentioned Production Credit Association as a loan source. This can be attributed to the Association's policy of lending only to farmers who have full-time, efficient units.

At the other end of the size-of-farm scale, farmers on units of more than 160 acres did not mention the Farmers Home Administration as a source of expansion credit. The loan limitations of Farmers Home Administration preclude loans to farmers who can obtain credit elsewhere. Large-scale farmers had other credit sources available and usually required more credit than the Farmers Home Administration loan limitations would allow.

Adjusting Farm Size

The past history of the project indicated that adjustments in farm size and organization were taking place rapidly. Some farmers had quit farming as their solution to the problem of low income; this type of adjustment will continue to take place. About half the farmers interviewed indicated that

they would seriously consider moving off the farm and would sell their farm for its present appraised value. Five farmers first stated that they would not move off the farm but when asked whether they would sell their farms, they answered yes. Presumably, these farmers would be willing to move if they could sell their farms.

Half the farmers who were willing to leave their farms indicated a high degree of dissatisfaction with farming conditions at the time of the survey in 1958. A local banker later stated that in 1960, the farmers' pessimism had changed to a generally optimistic outlook. Consequently, the percentage willing to sell in 1960 probably would be lower than was found in the survey.

There was no significant difference between areas within the project in the proportion of farmers willing to sell their farms. However, there was a significant difference between farmers on units of different sizes. More farmers on both the large and the small units were willing to sell their farms than were farmers on the middle-sized units. The small-unit farmers were dissatisfied with their incomes while farmers on large units tended to be opportunists. They were more willing to make businesslike adjustments for long-term gains, not from necessity but by choice.

The typical farmer with 90 to 160 acres of cropland was more satisfied with his present situation than farmers with either more or less land. He had all the land he could handle without the addition of considerable hired labor. He preferred farming to other occupations and liked the area. He had had some good as well as bad years, and he was trying to adjust his farm operations to changing conditions.

Reasons for nonexpansion differed among farmers on the three size groups of farms (Table 18). Large-scale operators had units as large as they thought they could profitably operate. The older farmers tended to be on smaller units, and they did not wish to take on more work, debts, or additional risks. Although land of all qualities seemed to be available, small operators report that land suitable to add to their farms was not available.

Basically, much of the reluctance of farmers to expand was caused by the uncertainty of future profits. Farm income had been slipping downward and the general feeling at the time of the survey was one of pessimism. Several farmers indicated that survival would depend upon adoption and use of the most economic practices.

Table 18. Reasons Farmers Were Not Presently Expanding Their Farm Businesses, North Unit Deschutes Project, Oregon, 1958.

Item	Number of farms reporting	Number reporting by size of farm		
		Small	Medium	Large
Expansion not presently profitable	12	4	5	3
Has enough work	11	2	5	4
Unable to finance	5	4	1	0
Too old	8	2	5	1
No land available	5	5	0	0
Doesn't want debt	4	1	2	1
Prefers off-farm work	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>
Total	46	19	18	9

CONCLUSIONS

Farmers on the North Unit Project have made substantial adjustments in their farm operations since first settlement in 1946. In 1958, further profitable adjustment opportunities were available to farmers, and in many instances, adjustments must be made or the farmers will not survive economically.

Need for adjustments in operation of the farms came about through changes in prices, technology, and miscalculations made in establishing original farm sizes. Original units were too small. Farms were not operated as subsistence-type farms as was originally planned. Within 8 years of complete Project settlement, there were 407 operating units, or one-third fewer than the 642 farm units originally planned.

Findings revealed that most farmers could not make an acceptable living on a farm of less than 100 acres. However, one-third of the farmers still were on units of less than 90 acres. As an average they had twice as much off-farm as farm income. Some of these farmers could make more money by working full time off the farm; others would find it profitable to increase farm size and quit working off the farm.

Farm budget analysis indicated that it would be profitable for farmers to increase the number of acres farmed. Returns to land, labor, and capital were greater than costs when the level of management was average or better. Small-scale farmers had enough labor to double the size of their operations

with only a small increase in costs other than variable operating costs. If additional land were not available, feeder cattle would be a profitable addition to the farm operation.

Farmers on average size units were fully utilizing their labor during peak summer months. They could add acres profitably if they could hire labor to suit their needs. At about 300 acres, farmers could fully utilize a hired man during the summer.

More than 90 percent of the farmers said that capital was available to enlarge their farms or to add livestock. Of these, 40 percent said they could finance expansion with their own funds and the rest said they could get loans for expansion. In 1958, 9 percent were expanding; 29 percent did not wish to expand because they felt they had all the land they wished to farm; 21 percent did not think expansion would be profitable. All of the small-scale farmers gave reasons for not wishing to expand in 1958, while only half of the large-scale farmers reported reasons for nonexpansion. Farmers favored cattle feeding two to one over increasing crop acreage. Feeders were primarily considered as a supplementary enterprise to utilize labor available in the winter. Also, a majority of the farmers produced hay and grain which could be marketed profitably through feeder cattle.

It is not likely that many of the small-scale farmers will increase their farm acreages. None of this group had done so in the past. By contrast, the large-scale farmers are more expansion minded and have the requisites to make expansion possible. Project farmers with more than 160 acres of farmland had added land an average of two and one-half times each. At the time of the survey, about 60 percent of these farmers wanted additional land. Judging by their past performances, many large-scale farmers would increase size of their operations.

If farmers were to leave their farms during the 1960's at the same rate as they did during the 1950's, there would be 120 fewer farmers. If all farms under 100 acres in 1957 were added to larger farms, there would be 198 fewer farms; or, if all of the 198 small farms of less than 100 acres could be combined into 98 farms, they would average 124 acres each. However, very few small-scale farmers have the desire, ability, or opportunity to farm large acreages. Some desire and are able to live on small farms of less than 100 acres. Others who continue to farm small units will require supplementary off-farm income in order to remain on the farm.

Production of grass seed and mint is increasing. Grass seed acreage doubled to one-eighth of the project land between 1957 and 1959. Varieties of grass such as Merion blue, Kentucky blue, and creeping red fescue will replace some of the alfalfa grown in rotation. Excellent yields can be obtained. A few farmers are beginning to specialize in grass seed and mint production.

Farmers who are displaced by farm enlargement will have a number of alternative job opportunities including both nonfarm work and farm work for other operators. Although half of the off-farm work was farm labor, only two operators of small units worked full time on other farms. The remaining farmers worked off their farms an average of 2 months. With similar future employment opportunities, about one-sixth of the small farmers

could be absorbed into enlarged units as farm workers.

Many underemployed farmers would prefer to stay on their small units and work part time when they could find jobs. If a full-time job opportunity became available, some would find it more profitable to quit farming altogether, and they would leave the farm. Farmers would be more likely to find out about and to accept full-time employment in the local community than to seek work in another area.

A comparison of two neighboring counties with Jefferson County showed that Jefferson County's economic growth was greatly stimulated by development of the North Unit Project. The other counties also had increased economic activity but at a slower rate than Jefferson County. Volume of trade in Jefferson County increased an average of 14 percent per year between 1947 and 1958. In the 1950's, nearly 1,000 people immigrated into Jefferson County. Employment increased an average of 50 persons per year. Fast community growth was more than adequate to absorb farmers who quit farming up to 1958.

Future community job opportunities will depend not only upon farm income from the project, which had provided the major source of income in the area and led to increased job opportunities in related activities, but also upon general level of economic activity in the state and nation. One-sixth of the area nonfarm employment in 1958 was in lumber manufacturing. Before the Project, the proportion was about half. After Project development, employment had shifted more into trade and service activities, where half of the employment increase occurred. These industries are less affected by general economic changes than the lumber industry. Consequently, employment in the community will be more stable than before the Project was built.

Rate of business growth of the last 10 years may decline because secondary benefits induced by project construction and development no longer operate. Acreage of irrigated land reached a peak in the early fifties and is now stable. However, evidence indicates that trade and service industries will continue to grow to support the increasing population. A new water power project has been authorized for early construction. Industrial sites with adequate facilities are available for new industrial development. A larger area population and greatly improved community facilities may attract new industries. Tourism has increased and is being actively promoted by local business groups.

Community growth was important in providing job opportunities for operators of small farms who desired off-farm employment. In the early years of project farming, many farmers found that the originally planned units were too small to provide a satisfactory income. The planned units were less than half the size allowed by law. If settlers had originally occupied 160 acre units, farm consolidations would have proceeded at a much slower rate because more efficient operation of farm units would have been permitted.