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PRELIMINARY REPORT
on
FARM ORGANIZATION
in
TWIN FALLS AND LATAH COUNTIES
by
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On July 1, 1919, the University of Idaho and the Office of Farm Management and Farm Economics, U. S. Department of Agriculture,¹ entered into cooperative relations for the purpose of conducting farm management and farm economic investigations within the State of Idaho. Under this arrangement each of the cooperating institutions bears half of the expense of conducting the investigations. The information gathered is to be available to each of the cooperating parties. By this cooperative arrangement the work of the two institutions in this new field of research will be co-ordinated and the expense to the State of obtaining the information will be reduced approximately fifty per cent.

So far two projects have been undertaken, namely: (1) Farm organization investigations in the irrigated districts of Southern Idaho and (2) Farm organization investigations in the non-irrigated, grain producing counties of Northern Idaho. Both of these projects include crop cost of production studies.

The principal objects of these investigations are:

(1) To determine the labor, materials, and other elements of cost that enter into the production of farm crops, live stock, and live stock products.

1. Approved by the Office of Farm Management and Farm Economics, U. S. Department of Agriculture.

Note—Acknowledgement is due the farmers whose cooperation made these investigations possible. The author is also greatly indebted to Messrs. S. B. Nuckols, L. C. Aicher, N. S. Wight, C. C. Taylor, E. D. Strait, F. H. Shelledy, and L. A. Moorhouse who either assisted in gathering or tabulating the data.

(2) To determine the methods, farm practice, management, and farm organization which cause some farmers to excel and others to fail.

(3) To determine the variations during a five-year period in crop yields, in prices received for farm products, in the principal items of expense of conducting the farm business, and to note the influence of these variations upon the agriculture of the areas studied.

These studies, it is hoped, will lead to fairly accurate conclusions as to the crop rotations and cropping systems that should be followed and as to the relative profitableness of the different crops and classes of live stock. These data are sought with a view ⁽¹⁾ of improving the agricultural conditions of the district studied; ⁽²⁾ of serving as a guide in the development of several millions of acres of arid land in Southern Idaho that will doubtless be brought under irrigation within the next ten or fifteen years; and ⁽³⁾ of ascertaining the economic status of farming in representative districts during war, and post-war, conditions.

The following is a progress report of the investigations to December 31, 1920:

1. FARM ORGANIZATION INVESTIGATIONS IN THE IRRIGATED DISTRICTS OF SOUTHERN IDAHO.

In November and December, 1919, 230 farms in the vicinity of Twin Falls, Idaho, were visited and a record obtained from each farmer covering a year's business of his farm. The period covered by these records extended from December, 1918 to December, 1919. In addition to obtaining the regular farm business analysis survey record, a survey was also made of the man and horse labor and other elements of cost required to produce the principal crops, namely: wheat, bean, beet, potato, alfalfa hay, red clover hay and seed, and alsike clover seed. Since crop yields, prices of farm products, and the costs of labor, materials and other expenses fluctuate from year to year, it is planned to extend this investigation over a period of five years. This is deemed necessary in order to give reliable information. Of the 230 records obtained, 30 were discarded because of their incompleteness, inaccuracy, or because of certain unusual features of farm practice. The data presented in this report, therefore, are based upon a study of the business of two hundred farms.

Analyses of the Business of 200 Farms, Twin Falls County.

A summary of the business of 200 farms for the year 1919 is shown in Table 1. In analyzing the year's business the 200 records were arranged into five size-groups. Since there is considerable variation among the individual farms in the proportion of the farm area that is usable in the farm business, acres of tillable land were used as the basis for arranging the farms into size-groups. The data presented are averages for the respective groups and for the 200 farms as a whole. The data, it should also be kept in mind, pertain only to the farm year 1919.

TABLE 1. Summary of the business of 200 farms, 1919, Twin Falls County, Idaho.

	Farms grouped according to tillable land (1)					All Farms
	Less than 37 acres	37-40 acres	40.1-70 acres	70.1-80 acres	Over 80 acres	
Number of farms	42	38	41	40	39	200
Acres per farm	34	40	63	80	149	73
Tillable land per farm	29	38	57	76	134	66
Tillable pasture per farm	2	3	3	6	9	4
Acres in crops	27	35	54	70	125	62
Acres in wheat	12	13	23	35	55	27
Acres in alfalfa	6	7	12	14	26	13
Acres in beans	2	4	4	8	16	7
Acres in sugar beets	2	3	4	3	11	5
Acres in potatoes	1	2	3	3	3	2
Acres in clover	1	2	3	2	4	2
Acres in other crops	3	4	5	5	10	6
Farm capital	\$15,298	\$18,960	\$25,875	\$35,368	\$58,092	\$30,521
Real estate	13,289	16,817	23,058	31,650	51,934	27,170
Live stock	767	763	1,090	1,307	2,328	1,245
Machinery	592	709	853	1,148	1,586	994
All other	650	671	874	1,263	2,244	1,112
Real estate per acre	394	415	364	396	348	372
Receipts	\$ 2,492	\$ 2,897	\$ 4,172	\$ 5,936	\$ 9,055	\$ 4,879
Crops, per cent.	78	79	78	83	86	82
Livestock, per cent ..	13	12	14	12	9	11
All others, per cent ..	9	9	8	5	5	7
Expenses	\$ 1,086	\$ 1,374	\$ 1,737	\$ 2,449	\$ 4,249	\$ 2,160
Farm income	1,406	1,523	2,435	3,487	4,806	2,719
Interest on capital 7% ..	1,071	1,327	1,811	2,475	4,066	2,136
Labor income	335	196	624	1,012	740	583
Family perquisites (2) ..	327	341	304	369	448	357
Labor income and perquisites ..	662	537	928	1,381	1,188	940
Unpaid family labor	41	108	89	104	246	116
Operator's labor	784	806	920	926	1,018	890
Return on capital, per cent (3) ..	6.2	5.6	7.0	8.3	7.3	7.2
Index per cent (4)	86	78	97	115	101	100

(1) Note that the range of the second size-group is only 4 acres, 37 to 40 inclusive. This is to allow the 40-acre farms to fall within a group to themselves. The range of the fourth size-group is also narrow to permit the 80-acre farms to be grouped by themselves.

(2) Perquisite—Value of farm products used by family and use of farm dwelling.

(3) Based on farm income plus value of perquisites less value of operator's labor.

(4) The percentage that the average rate of income on capital for each group of farms is of the average rate of income on the capital for the 200 farms. That is, 6.2 per cent, 5.6 per cent, 7.0 per cent, 8.3 per cent and 7.3 per cent divided by 7.2 per cent.

The Farm Area

The farm area is the total amount of land operated as one farm. It may lie in one body or in several tracts. The farms included in this study varied in size from 17 acres to 345 acres, the average for the 200 farms being 73 acres. Of this 73 acres, an average of 62 acres were devoted to crops, 4 acres were tillable pasture and approximately 7 acres were waste land and untillable pasture. The waste land consists of roads, ditches, canals and all other land not used for pasture or to produce crops.

Crops

The principal crops grown in 1919 were wheat, alfalfa, bean, sugar beet, potato and clover. Only a very limited amount of oats, barley and corn were grown. Wheat occupied approximately 44 per cent of the total crop area of the 200 farms, alfalfa 21 per cent, beans 11 per cent, sugar beets 7 per cent, potatoes 4 per cent, and clover (both hay and seed) 4 per cent. There is a remarkable similarity in the percentages of the crop area that were devoted to the various crops among the different size-groups. However, there was some variation. A slightly greater proportion of the crop area was devoted to wheat by the groups of larger farms than by the smaller size-groups. The large farms also tended toward a greater production of beans, proportionately, than the small farms.

The average crop yields per acre for the 200 farms were as follows: Wheat 38 bushels, barley 40 bushels, potatoes 137 hundredweight, beans 1122 pounds, sugar beets 9.2 tons, alfalfa hay (3 cuttings) 3.9 tons, red clover hay (1 cutting) 1.1 ton, red clover seed 286 pounds, and alsike clover seed 318 pounds.

Live Stock

In order to compare the different classes of farm animals, the live stock on these farms was computed in terms of animal units. In this study one horse, one cow or one steer was counted as one animal unit. Also, two head of young stock (of the above kind), or 7 sheep, or 5 hogs, or 100 chickens were considered an animal unit.

The average number of animal units kept per farm varied from 7 for the group of smallest farms to 21.3 for the group of largest farms. This is approximately one animal unit to each 4 acres of tillable land for the former size-group and one animal unit to each 6 acres of tillable land for the latter. That is, the smallest size-group carried approximately 50 per cent more live stock per tillable acre than the largest size-group. On an average horses and colts constituted 38 per cent of the total animal units on the 200 farms, dairy cattle 31 per cent, sheep 12 per cent, hogs 10 per cent, poultry 7 per cent and beef cattle less than 2 per cent. The small farms carried a greater proportion of work horses, dairy cattle and poultry than the large farms. Most of the sheep and beef cattle were found on the large farms.

Farm Capital

Capital, in Table 1, includes real estate, live stock, machinery, and other investments used in conducting the farm business. The total capital ranged from \$15,298 for the group of smallest farms to \$58,092 for the largest size-group, the average for the 200 farms being \$30,521. Of this latter amount \$27,170 were in real estate, \$1,245 in live stock, \$994 in

machinery (includes automobile) and \$1,112 in feed and supplies, cash to run the farm, etc. The value of real estate per acre averaged \$372 for the 200 farms. The average value of real estate, it will be noted from Table 1, was highest in the second size-group and lowest in the group of largest farms.

Receipts

The farm receipts are derived from the sale of crops, the net increase from live stock and from outside labor, the rent of buildings, etc. If the value of crops and supplies on hand at the end of the year was greater than at the beginning, the difference is considered a receipt.

Beginning with the group of smallest farms, the average receipts per farm for the different size-groups were \$2,492, \$2,897, \$4,172, \$5,936, and \$9,055 respectively. For the 200 farms as a whole, 82 per cent of the receipts were from the sale of crops, 11 per cent from the net increase from live stock, 2 per cent from miscellaneous sources and 5 per cent from an increase in feed and supplies. The percentage of receipts from the different sources, it will be seen, does not vary widely among the different size-groups. *It will also be seen that cash crops with a very limited amount of live stock was the type of farming practiced by each of these groups of farms.*

Expenses

Farm expenses include not only the money actually paid out during the year in conducting the farm business but also the value of the unpaid labor performed by the members of the farm family. The value of the farmer's labor is not included in expenses. If the value of crops or supplies on hand at the end of the year was less than at the beginning, the difference is considered an expense. Personal and household expenses are not included.

The expenses for the 200 farms averaged \$2,160. The average expenses ranged from \$1,086 for the group of smallest farms, to \$42 49 for the largest size-group. The percentage of expenses required for labor increased steadily from 22 per cent for the group of smallest farms to 40 per cent for the group of largest farms. This is due to the fact that a much greater proportion of the labor is performed by the operator on small farms than on large ones. Depreciation, on the other hand, is much greater, proportionately, on the small farms than on the large ones. This is because a greater percentage of the capital is in buildings and machinery on small farms than on large ones.

Farm Income

Farm income is the difference between receipts and expenses. It represents the earnings of both the farm capital and the labor and man-

agement of the farmer. Farm income averaged \$1,406 for the group of smallest farms and increased with each succeeding size-group to \$4,806 for the group of largest farms. *If there are no debts to pay farm income represents quite accurately the average plane upon which the families of the respective size-groups of farms must live.* Farm income also represents satisfactorily the financial success of the several size-groups.

Labor Income

Labor income is the amount the farmer has left for his labor after allowing 7 per cent for the use of the farm capital. In addition to labor income the farmer also receives the use of the farm dwelling and the food products consumed by his family.

Family Perquisites

Family perquisites represent the value of the farm grown food products consumed by the farmer's family, also the residence value of the dwelling. The value of food products used in boarding the farm labor is not included. For the 200 farms the average value of family perquisites was \$357. Of this amount the use of the farm dwelling constituted 34 per cent, meats 14 per cent, milk 15 per cent, butter 12 per cent, garden produce 10 per cent, eggs 8 per cent, fruit 5 per cent, and potatoes 2 per cent.

Labor Income Plus Perquisites

The sum of labor income plus perquisites represents the full amount the farmer has left for his labor after allowing 7 per cent for the use of the farm capital. This averaged \$662 for the group of smallest farms, \$537 for the second size-group, \$928 for the third, \$1,381 for the fourth and \$1,188 for the fifth, the average for the 200 farms being \$940.

Return on Capital

In computing the return on capital the value of the family used perquisites are added to farm income. From the sum thus obtained the estimated value of the operator's labor is subtracted and the remainder is divided by the total farm investment.

Note, from Table 1, that the average returns on the capital of the 200 farms was 7.2 per cent. Not, also, that the group of smallest farms made 6.2 per cent on the average farm investment, the second size-group 5.6 per cent, the third 7.0 per cent, the fourth 8.3 per cent and the group of largest farms 7.3 per cent. It will thus be seen that the fourth size-group (the 80 acre farms) made the highest return on capital and the second size-group (the 40 acre farms) made the lowest. The return on capital of the respective size-groups as compared with the average of the 200 farms is expressed in Table 1 in percentages under "Index". On this

basis the return on capital of the group of smallest farms was 86 per cent of the average for the 200 farms; the second size-group was 78 per cent; the third size-group 97 per cent; the fourth size-group 115 per cent; and the group of largest farms 101 per cent.

Direct Crop Labor Requirements

The gross value per acre and the direct labor required to produce and market an acre of each of the leading crops are shown in Table 2.

TABLE 2. *Average number of hours of direct labor required to produce and market an acre of each of the principal crops grown in the Twin Falls, Idaho, area, 1919.*

	Number of records used	Average yield per acre	Gross value per acre	Direct labor required per acre	
				Man Hours	Horse Hours
Alsike clover seed	8	316 lbs.	\$126.40	17.8	11.4
Red clover seed (1)	21	302 lbs.	153.53	25.6	23.4
Alfalfa hay (2)	48	4.3 tons	64.44	32.7	32.5
Wheat	68	41 bu.	75.44	24.4	42.8
Beans	44	1,194 lbs.	83.58	44.1	50.5
Potatoes	42	140 cwt.	249.20	77.9	50.5 9/4
Sugar beets	44	10.9 tons	113.98 (3)	133.0	110.0

1. Includes 1.1 tons hay at \$13.33 per ton.

2. Cut three times during the season.

3. Includes value of both beets and tops.

The data in Table 2 are based upon the labor records obtained for the respective crops as shown in the second column of the table. For this reason the yields given vary slightly from the average yields of the 200 farms. The data presented, it must be kept in mind, pertain to the crop year 1919.

Note the wide range in the labor required to grow and market an acre of the respective crops. Alsike clover seed, at one extreme, required only 17.8 man hours and 11.4 horse hours per acre. Sugar beets, at the other extreme, required 133 man hours and 110 horse hours. These figures are quite significant when considered in connection with the gross value per acre of these crops. Of the three intertilled crops the table shows quite conclusively that potatoes were the most profitable in 1919 with beans second. This is also shown by another tabulation as follows: 32 farms that grew potatoes, but no beans or beets, made 9.9 per cent on the farm investment; 42 farms that grew beans but no potatoes or beets, made 7.21 per cent; and 23 farms that grew beets but no potatoes or beans, made 5.4 per cent. However, in considering the relative profitableness of these crops, it must be remembered that 1919 was an exceptionally good potato year and a very poor beet year. The total production of potatoes in the United States in 1919 was approximately 40,000,000 bushels below the normal. This deficiency in yield caused much of the 1919 potato crop

of the area studied to sell at a very high price. The price of potatoes is usually high and low on alternate years and the return of the survey for the year 1920 may place beets highest and potatoes lowest in profitableness.

Influence of Crop Yields on the Returns on Capital

Table 3 is designed to show the influence of high and low crop yields on the return of the farm investment.

TABLE 3. *Influence of crop yields on the returns on the farm capital, 200 farms, Twin Falls, Idaho, area, 1919.*

Farms grouped according to average crop yields	Average per cent on investment	Number of farms	Average tillable area
Per cents of average yield:		Per cent	Acres
86 and less	40	4.68	72
87 to 95	42	5.84	68
96 to 107	38	7.48	69
108 to 120	40	8.05	61
121 and over	40	9.88	60

In the first column of the table the 200 farms are arranged in groups according to the average crop yield of the individual farms. The 40 farms having average crop yields of 86 or less per cent of the average returned only 4.68 per cent on the investment. As the average crop yield increased in the respective groups, the per cent on investment also steadily increased until the last group is reached, the 40 farms having crop yields of at least 121 per cent of the average. This group of farms, it will be noted, made 9.88 per cent on the farm capital.

Relation of Size of Farm to the Efficient Use of Labor and Machinery

Table 4 is designed to show the influence of the size of farm to the efficient use of labor and machinery.

TABLE 4. *Influence of size of farm on efficient use of labor and machinery on 200 farms, Twin Falls, Idaho, area, 1919.*

Size of farm in tillable acres	Number of farms	Crop acres per 12 months of man labor	Crop acres per work horse	Value of machinery per crop acre
Less than 37	42	32	10.5	\$25
37 to 40	38	36	11.0	20
40.1 to 70	41	45	14.0	16
70.1 to 80	40	51	15.3	16
Over 80	39	60	18.4	13

The size of farm has a marked effect upon the possibility of efficiently organizing and operating farms. Note that in the smallest group of farms there were 32 crop acres per 12 months of man labor while in the largest size-group there were 60 acres. In the smallest size-group there

were also 10.5 crop acres per work horse kept as compared with 18.4 crop acres per work horse in the group of largest farms. The large farms also have the advantage in the use of farm machinery. Note, further, that in the group of smallest farms there were \$25 invested in machinery per crop acre and only \$13 per crop acre in the largest size-group.

Second Year of Farm Surveys

On November 21, 1920, a crew of five men was assembled at Twin Falls for purpose of taking the farm records for the second year of investigation. The survey is now in progress and it is planned to obtain records from at least 230 farmers. The same area is being covered in this year's work that was studied last year and an effort is being made to obtain records from the same farms that were taken last year.

Cost of Producing Sugar Beets, Twin Falls County, Idaho, 1919. (1)

The cost figures presented in Table 5 are based on 44 records and a total of 687 acres of beets. Of the 687 acres of beets, 79 per cent were grown by men who owned the land, 11.6 per cent by cash rent tenants, and 9.4 per cent by share rent tenants. The 44 farms had an average of 63.74 acres in crops. Of the crop area (63.74 acres) 24.5 per cent were devoted to sugar beets, 27 per cent to wheat, 24.7 per cent to alfalfa (both hay and seed), 6.9 per cent to fruit and garden, 5.9 per cent to beans, and 4.4 per cent to potatoes. The remaining 6.6 per cent of the crop area were devoted to corn, oats, barley, other hay, fallow land, etc.

The tabulating of the sugar beet cost data was done in the Office of Farm Management and Farm Economics, U. S. Department of Agriculture under the direction of Mr. L. A. Moorhouse. Mr. S. B. Nuckols of the Office of Sugar Beet Investigations, U. S. Department of Agriculture assisted in taking the records and also with the tabulations. The cost of producing a ton of beets was determined by dividing the total of all costs by the total number of tons marketed. The cost per acre was also determined by dividing the total cost by the number of acres grown.

The cost data in Table 5 are assembled under three headings, namely, labor, material, and other costs. Of the total labor cost (\$73.98 per acre) \$28.28 represents unpaid labor of the farmer and his family (approximately 63 hours), \$27.06 the contract hand labor, \$3.78 other contract labor, and \$14.86 horse labor (approximately 99 hours). Unpaid man labor was accounted for at 45 cents per hour, unpaid horse labor at 15 cents per hour and all hired labor, both man and horse, at the actual cost.

1. The tabulation of the cost data for the other crops is not completed and can not be included herewith.

TABLE 5. *Cost of producing sugar beets, Twin Falls County, Idaho, 1919.*

Items of Cost	Use of land included			Use of land excluded		
	Total per acre	Cost per ton	Per cent of total cost	Total per acre	Cost per ton	Per cent of total cost
Labor:						
Man (133 hours)	\$ 73.98	\$ 6.78	54.2	\$ 73.98	\$6.78	72.5
Horse (110 hours)						
Materials:						
Manure (12 loads per acre)	3.46	.32	2.5	3.46	.32	3.4
Seed (15 pounds per acre)	2.29	.21	1.7	2.29	.21	2.2
Water	3.15	.29	2.3	3.15	.29	3.1
Other costs:						
Taxes and insurance	3.70	.34	2.7	3.70	.34	3.6
Machinery	7.23	.66	5.3	7.23	.66	7.1
Overhead	8.29	.76	6.1	8.29	.76	8.1
Land	34.29	3.14	25.2
Total of all costs	\$136.39	\$12.50	100.0	\$102.10	\$9.36	100.0

The cost of materials includes the estimated value of manure in the yard, the amount of money paid for manure on a few farms, the expense for beet seed and the water assessments. A few of the beet growers purchased some additional water which raised the water cost from \$3 per acre to \$3.15.

"Other costs" includes taxes, insurance, the use of machinery, overhead expense, and the use of land. These are charges which apply to the whole farm and which were distributed to the different farm enterprises so that each would carry approximately its proper proportion.

Overhead, in this case, equals 10 per cent of the total costs of both labor and materials. On owner farms 8 per cent of the value of land was used as the charge for land. On rented farms the actual rents paid were used. Table 5, it will be noted, shows the cost per acre and per ton with the use of land both included and excluded.

Note, from Table 5, that the total average cost of producing sugar beets, when the use of land is included, was \$136.39 per acre and \$12.50 per ton. Of the total cost per acre, labor was 54.2 per cent, manure 2.5 per cent, seed 1.7 per cent, water 2.3 per cent, taxes and insurance 2.7 per cent, machinery 5.3 per cent, overhead 6.1 per cent and land 25.2 per cent. When the use of land is excluded from the cost items, the average costs were \$102.10 per acre and \$9.36 per ton.

The average yield of beets for the 687 acres was 10.9 tons, the price received per ton was \$11.00, and the total value of the beets per acre (both beets and beet tops), was \$124.88. Since the average cost per acre exclusive of the use of the land was \$102.10, the margin of profit per acre

was \$22.78. At an average valuation of \$442 per acre for the 687 acres, this is a return of 5.15 per cent on the investment.

In considering these cost figures (\$136.39 per acre and \$12.50 per ton) it must be remembered that these men were allowed 8 per cent on the capital invested in the business. They were also allowed 45 cents per hour for their own labor. The cost per ton ranged from a minimum of \$9 to a maximum of \$35. The average yield of the 8 farms having the lowest cost was 15.2 tons per acre. The farm having the highest unit cost, on the other hand, produced only 3 tons per acre. There were 6 farms on which the yield ranged from 3 to 7 tons per acre and on which the cost exceeded \$20 per ton.

2. FARM ORGANIZATION INVESTIGATIONS IN THE NON-IRRIGATED GRAIN PRODUCING COUNTIES OF NORTHERN IDAHO

This project was undertaken on June 1, 1920, in cooperation with the Washington State College and the Office of Farm Management and Farm Economics of the United States Department of Agriculture. The basis for the investigation of this project is also a study of the year's business of some 250 farms. At the time the records of the farm business were taken complete cost of production data were also obtained for all of the crops grown. The area studied embraces a portion of both Whitman County, Washington, and Latah County, Idaho. Each of the co-operating parties furnished two men while taking the 250 records. Owing to the lack of funds for employing the necessary clerical force, the Office of Farm Management and Farm Economics took the records to Washington, D. C., and assumed the responsibility of making the tabulations. The cost figures on wheat will probably be available about March 1st, 1921. It is planned to continue this investigation for one or more years.