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Profitable Systems of Farming for the Idaho Falls Area

By

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Profitable Systems of Farming for the Idaho Falls Area

By

PAUL A. EKE and NEIL W. JOHNSON*

Introduction

IN the early days of American agriculture the produce of the farm satisfied practically all the needs of the farmer and his family. Decisions on the acreage to be planted to each crop and the amount and kind of livestock to be kept were largely governed by the needs of those on the farm. A complete reversal of this situation now makes it necessary for the farmer to assume the much more difficult task of deciding the nature and volume of his farm enterprises on the basis of the probable needs of others. Frequently the ultimate consumer of his produce is thousands of miles from the farm. The farmer, then, must depend largely on Federal and State agencies to prepare for him information on the supply and demand conditions for each commodity, gathered from the four corners of the earth.

Purpose of Study

The chief purpose of this study is to determine the enterprises and the forms of farm organization which are best adapted to the physical and economic conditions of the Idaho Falls area. The study is also designed to yield information for developing farm plans which would be likely to give best results under prevalent conditions, and for adjusting these plans to meet changed price relationships as they arise. To this end interviews were obtained with farmers and business men of the area, published material consulted, and a considerable volume of basic information assembled.

The budget analysis here used illustrates a method which the farmer may use to eliminate much of the guesswork from decisions he must make in planning for the year ahead.

The Area Studied.

The irrigated area adjacent to the city of Idaho Falls in Bonneville county, extending from Shelley on the south to Rigby on the north and including the entire width of the irrigated land east and west, was selected for study. The adjacent Snake River valley south and north resembles this area in many respects, but enough differences exist to make some of the facts and conclusions for the Idaho Falls area inapplicable. In broad outline, however, this study gives a good picture of the type of farming which prevails in this Upper Snake River area. The Idaho Falls section has an elevation of slightly over 4,700 feet, with maximum temperatures averaging 96°F.; minimum, (-) 18 degrees, with an average of 45 degrees for the year. The last killing frost in the spring occurs about June 1 and the first killing frost in the fall about September 7, giving an average growing season of

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124 days. A total precipitation of less than 10 inches, with slightly over half falling during the growing season, is characteristic of the district.

In topography, the area studied is generally level except for the natural slope of the valley to the south and west. In parts of the area the land surface is somewhat cut up by the meandering of numerous creeks finding their way to the Snake river.

The early history of this region seems to date from 1863 when a ferry was built on the Snake river about nine miles above the present site of Idaho Falls. This ferry was on the Lander trail, a pioneer way across the mountains to the west. In 1865 a toll bridge was built and a post office established at Eagle Rock (which is now Idaho Falls) the oldest permanent settlement in the valley. The Utah and Northern railroad (now the Oregon Short Line) was completed as far as Eagle Rock in 1879. The few settlers then in the valley were located at the junction of the North and South Forks of the Snake river and along Willow creek, where hay and pasture were easily grown on sub-irrigated land. Some attention was given to stock raising, but hunting and trapping were the chief sources of income.

Twelve miles of the first irrigation canal (now the People's Progressive) were completed in the spring of 1880, the work being promoted by the business men of Eagle Rock who were beginning to see the agricultural possibilities of the area. About this time groups of Mormon immigrants arrived from Utah, were favorably impressed, and invited others of their number to the area. The year 1880 marks the beginning of the significant agricultural development of the region. It was comparatively easy to divert water from the Snake river for irrigation purposes and farmers clubbed together and built small independent canal systems which are still in operation. In most years an abundance of water is available, and always at very reasonable rates, the annual maintenance charge averaging in many cases less than one dollar per acre. Alfalfa, potatoes, and small grains were early found well adapted to the area, and the production of sugar beets and seed peas has gained prominence.

The Oregon Short Line now serves the entire Upper Snake River valley and an improved highway, (the main connection between the central and southern United States and Yellowstone National Park), extends the entire length of the valley. The main cross roads are gravelled and others are being improved although a number of dirt roads still become troublesome in wet weather.

Nature of the Soil

A cross section of the soils east of the Snake river in the area studied reveals a surface alluvial deposit of varying degrees of fineness and depth, underlaid by a layer of gravel, which in turn rests on a foundation of basaltic rock. This construction provides ample drainage, and very little accumulation of alkali may be expected. One narrow strip of dune sand extends through the valley from the southwest to the northeast and has little agricultural value.

The soil west of the Snake river in the Idaho Falls area is aeolian rather than alluvial and consequently quite uniform in nature. Cracks in the underlying basalt provide good drainage for this district. For the purpose of this study the soils of the area were divided into five easily recognized types. These types arranged in order from coarsest to finest are gravelly loam, sandy loam, New Sweden loam, silt loam, and clay loam. All these types are found east of the Snake river except the New Sweden loam which is the aeolian soil of the western portion of the valley.

Due to the meandering of the small streams crossing the area, most of the farms on the east side of the Snake river include several of these soil types. For the most part, the same crops are grown on all soil types in the

area. Where the soils are sufficiently uniform, however, farmers prefer to utilize the heavier soils for the production of sugar beets and small grains, leaving the lighter soils for the growing of potatoes and seed peas.

Crop Yields Obtained in the Area

Table I presents average yields on the various soil types for the main crops of the area. These yield figures were obtained through interviews with a large number of growers. Each man was asked to give per-acre yields on the various crops he produced on certain fields for each year consecutively as far back as he could remember. This method is open to two main objections: first, the bulk of the yields obtained was for very recent years; and, second, there was a probable tendency for the grower to remember more accurately extremely good or extremely poor yields in the past. The averages obtained from these data were subjected to two careful checks. A number of growers on each soil type were visited and asked to estimate normal yields for the different crops under their own conditions. These normal estimates were then compared with the averages based on actual yields. Finally the average figures shown in Table I were submitted to a number of leading farmers for their criticism before adoption.

Yields used in the balance of this Bulletin are those shown for the sandy loam soil in Table I. This soil type was chosen as the basis for discussion because it is probably more often predominant than any other in the area and because a greater amount of data was gathered on it. The average figures of Table I necessarily imply the presence of many yields above and below those shown. Growers should be able to realize yields well above the average where soils are uniformly good, or where better than average efficiency is used in cultural methods.

The Collection and Presentation of Data.

The data for this study were gathered during the summer of 1931. Large numbers of growers in the Idaho Falls area who were interviewed supplied information on the amount of labor involved in the production of the various crops, and the time at which it should be applied. They detailed the main items of cash expenditure for materials, supplies, hired labor, water maintenance, taxes, and upkeep expenses, and furnished data on the resultant yield of crops.

Local implement dealers gave figures on the cost of farm equipment. Prices on all farm crops except potatoes were obtained from local agencies for each year of the study. Weighted average Russet potato prices were derived from the published annual reports of the Market News Service of the United States Department of Agriculture.

An analysis of the data gathered indicated those cropping rotations most nearly approximated in actual practice in the area. Five 7-year rotations and two 6-year rotations were chosen after consultation with leading farmers, extension workers and the records of the Experiment Substation at Aberdeen. They were chosen because experience has indicated that soil fertility can be maintained by following these rotations. These rotations also contain combinations of cash crops which will permit comparisons of returns of the various crops. The 6-year rotations allow comparisons with the 7-year rotations where alfalfa occupies a smaller percentage of the acreage. They are as follows:

1. System 1:—3 years of alfalfa followed by 2 years of potatoes, 1 year of sugar beets and 1 year of wheat.
2. System 2:—3 years of alfalfa, 1 year of potatoes, 2 years of sugar beets and 1 year of wheat.
3. System 3:—3 years of alfalfa, 2 years of potatoes, 1 year of

TABLE I.

Average Crop Yields on Different Soil Types, Idaho Falls Area, 1930 and Immediately Previous Years.

Crop	Unit	Soil types											
		Gravelly loam		Sandy loam		New Sweden loam		Silt loam		Clay loam		All Soil types	
		No. cases	Yield	No. cases	Yield	No. cases	Yield	No. cases	Yield	No. cases	Yield	No. cases	Yield
Potatoes ¹	Field sacks	78	145.0	168	157.5	119	161.0	52	168.8	35	136.1	452	155.9
Beets	Tons	14	12.2	77	13.9	12	10.7 ²	46	15.1	24	13.7	173	13.8
Peas (perfection, mach. run) ³	Bu.	20	29.4	27	33.9	25	36.2	12	32.7	..	....	84	33.3
Peas (perfection, cleaned) ^{3 4}	Bu.	20	25.7	27	29.7	25	31.7	12	28.6	..	....	84	29.1
Alfalfa	Tons	62	3.0	101	3.3	85	3.5	37	3.0	41	3.2	326	3.2
Wheat (nurse crop)	Bu.	54	38.6	101	42.2	42	44.5	33	43.3	45	43.1	275	43.1 ⁵
Barley (nurse crop) ⁶	Bu.	4	48.8	8	50.0	..	....	9	57.8	9	60.6	30	55.4
Oats (nurse crop)	Bu.	18	51.4	14	58.8	9	60.5	8	58.8	8	65.2	57	57.6 ⁷

¹ Field sack estimated to weigh 110 pounds, allowing for shrinkage.² White fly infestation apparently accounts in large part for relatively low yields west of the Snake River.³ 1930 yields only. Scaled down 12 1/2 per cent (the estimate of yield above normal).⁴ An average of 12 1/2 per cent deducted from machine run yield for screenings and hand picks.⁵ Yields averaged 4.42 bushels per acre higher when wheat was not used as a nurse crop.⁶ Estimates of normal yields as nurse crop as furnished by growers.⁷ Yields averaged 7.10 bushels higher per acre when oats were not used as a nurse crop.

- Perfection peas and 1 year of wheat.
4. System 4:—3 years of alfalfa, 2 years of potatoes, 1 year of sugar beets and 1 year of Perfection peas.
 5. System 5:—3 years of alfalfa, 1 year of potatoes, 1 year of sugar beets, 1 year of Perfection peas and 1 year of wheat.
 6. System 6:—3 years of alfalfa, 2 years of potatoes, and 1 year of Perfection peas.
 7. System 7:—3 years of alfalfa, 2 years of potatoes, and 1 year of wheat.

The feasibility of livestock enterprises is studied by adding to system 1 either a 14-cow dairy, a farm flock of 124 ewes, or a 3-sow-hog unit.

Budgeting the Farm Business

As stated on page 1 the budget method may be used by the farmer to eliminate much of the guesswork from the decisions which he must make in planning his farm business. More specifically, the budget method is an attempt to anticipate the probable returns from each farm enterprise before it is undertaken. Rather vague mental calculations are used by most growers when deciding the kind of crops and the volume in which they will be grown in the new season. These decisions usually are made in a haphazard manner by following "hunches" that certain farm enterprises will pay well the coming year and by otherwise resorting to guesswork measures. It is comparatively easy, by utilizing available sources of information and exercising sound judgment, to decide the farm enterprise that probably will prove most profitable in the coming season. It is more difficult and entirely beyond the realm of "Rule of thumb" methods to decide the proper combination of this most profitable enterprise with other necessary enterprises of the farm to produce the organization which will yield the greatest annual and average long-time net return. The budget method furnishes a simple means of approximating net returns from various proposed organizations of crop and livestock enterprises and affords a safer basis for choosing the ones likely to prove most profitable.

Method of Constructing a Farm Budget

Essentially the budget method involves setting down all the expected expenses which may result from the operation of a certain farm organization, all the expected receipts from the sale of crop and livestock products, and the calculation of the estimated net income for the year. The method though little used by farmers is not new, dating back at least twenty centuries to the admonition to first count the cost before building the house.

The six sections of *Table II* illustrate an easy progression through the tabulation of receipts and expenses to the calculation of the resultant profit or loss. The reader should not take alarm at the amount of work apparently necessary to come to the desired conclusion. The calculations purposely have been separated into quite definite and easily comprehended groupings rather than condensing the process to such a degree that certain important items might be overlooked or confusion result.

The sample budget of *Table II* is based on a rotation of three years of alfalfa, followed by two years of potatoes, one year of sugar beets, and one of wheat. This cropping system is quite common in the Idaho Falls area. It is applied to 80 acres of sandy loam soil farmed by one man with four horses for 1925-30 average yields, costs and prices.

The average amount of land used for waste, farmstead, roads, etc., on 80-acre farms in this area was found to be 11.4 acres, leaving 68.6 acres

to be cropped.

In setting up a crop rotation the farm land usually is divided into as many fields as there are years in the rotation. It is desirable that these fields be of nearly the same size if the farm layout makes this feasible. Accordingly, in *Table II* the crop land is divided into seven fields of 9.8 acres each. Every year three of these fields will be assigned to alfalfa production, two to potatoes, and one each to sugar beets and wheat. Alfalfa will be seeded down with the field of wheat each year and the oldest field of alfalfa plowed up for potato production. As the crops are rotated each field will be in alfalfa for three out of seven years, which should aid in maintaining soil fertility.

Section A of *Table II* shows the contemplated acreage, production and disposal of each crop in System 1. Both per-acre and total yields are given and the amount accounted for in feed, seed, or sales. Care should be taken to use only conservative yields based on the previous yield performances of the farm in question. Possibly the weakest spot in the budget approach is in the necessity of forecasting the probable price of farm products considerably in advance of the time they are sold. Conservative figures should be adopted, based on the current outlook material available from federal and state agencies.¹ During periods of fairly stable price relationships much can be learned about those combinations of crop and livestock enterprises which are most profitable by preparing budgets for previous years, using cost items and returns which need not be estimated but are a matter of record.

Section B of *Table II* pertains to the kind and volume of livestock production in the proposed farming system and supplies the same kind of data for livestock that Section A furnishes for crops. No livestock other than work horses are carried in System 1 but Section B provides for the necessary entries in case one or more livestock enterprises are carried on the farm. Here, as with crops, extreme care should be taken in estimating the probable volume of production and the probable returns.

Section C of *Table II* lists all the direct expenses contemplated in the production of crops. Materials and supplies for each crop are carefully listed and where contract labor is used the estimated charge is entered. Other labor expended in crop production is divided between that which the farmer does himself and that which he must hire done. An important part of the budget analysis is the estimation of the amount of hired labor necessary under different combinations of crops and livestock. It is often a distinct advantage to have the enterprises of the farm so organized as to reduce to a minimum the amount of cash expenditure for hired labor. This is particularly desirable in weathering through lean years. Data were obtained from growers on the time of performance and the amount of man and horse labor used in the main tillage operations. From this material, tabulated in *Tables XVII* and *XVIII* of the appendix, it was possible to approximate the direct man and horse labor required per acre of crop by 15-day periods throughout the growing season.

Having established per-acre requirements throughout the year in the production of a given crop, the total direct labor is easily computed by multiplying by the number of acres in that crop. When this operation is repeated for each crop grown and the results totaled, an approximation is obtained of the total amount of direct labor required by all crops in the rotation during each 15-day period of the season.

"Direct" labor as used in this study may be defined as work other than contract labor which constitutes the usual field operations performed on each crop in normal seasons. As contrasted with direct labor, there is a

¹ Outlook information both State and Federal may be obtained free by writing to the Extension Economist, Extension Office, Boise, Idaho.

TABLE II—SECTION A
Crops: Acreage, Production, and Disposal in Budget for System 1—1925-30 Average Conditions, Idaho Falls Area,
Sandy Loam Soil
(80 Acres, 1 Man, 4 Horses)

Crops	Acres in crop	Unit	Production		Disposal of Products			
			Per acre	Total	Farm Use		Price ² Amount per unit	Sales Value
					Feed	Seed		
Alfalfa	29.4	Ton	3.3	97	16	..	81 Dollars 8.67	702.27
Potatoes	19.6	Cwt.	173.25	3396	..	176	3220 Dollars 1.40	2930.20
No. 1—65%		Cwt.					2093 Dollars .82	580.56
No. 2—22%		Cwt.					708	
Culls—13%		Cwt.					419	
Beets	9.8	Ton	13.9	136	..	..	136 @ .40 per T of beets	983.28
Beet tops								54.40
Wheat	9.8	Bu.	42.2	414	..	19	395 Dollars .99	391.05
	68.6							5641.76

¹ Waste land; farmstead, roads, creek banks, etc., takes up 11.4 acres.
² 1925-30 average prices received by Idaho Falls producers.

TABLE II—SECTION B.
Livestock: Number, Production and Disposal in Budget for System 1—1925-30 Average Conditions
Idaho Falls Area—Sandy Loam Soils.
(80 acres—1 Man—4 horses)—Cont.

Kind of livestock	Number	Unit	Production		Disposal of products			
			Per unit	Total	Farm use		Price Amt. per unit	Value Dollars
					Live- stock	Family		
Workstock	4	head	....	....	....	....	.... Dollars . ....	.....

TABLE II—SECTION C
Crops: Man Labor, Horse Work and Other Production Requirements in Budget for System 1—1925-30 Average
Conditions—Idaho Falls Area—Sandy Loam Soil
(80 Acres—1 Man, 4 Horses)—Cont.

Crop	Materials and Supplies					Labor Requirements								
	Kind	Unit	Amount	Price per unit	Value	General Farm Labor ¹		Contract Labor						
						Man hours	Horse hours	Kind	Unit	Amt.	Price per unit	Value		
				Dollars	Dollars							Dolls.	Dolls.	
Alfalfa (29.4 A.)	Seed	Lbs.	118.0	.27	31.86	691	492							
Potatoes (19.6 A.)	Cert. seed ²	Cwt.	20.0	1.94	38.80	842	1332	Picking up	sacks ³	3087.0	.07	216.09		
	Field sacks	A.	19.6	2.57	50.37			Haul to mkt	Cwt.	3220.0	.05	161.00		
	Formalin	A.	19.6	.11	2.16									
Beets (9.8 A.)	Seed	Lbs.	196.0	.15	29.40	258	412	Thinning	A.	9.8	8.00	78.40		
								Hoeing	A.	9.8	4.00	39.20		
								Top and load	Tons	136.0	.96 1/2	131.24		
								Haul to dump	Tons	136.0	.60	81.60		
Wheat (9.8 A.)	Cop. Carb.	A.	9.8	.10	.98	195	280	Clean seed	Cwt.	11.4	.10	1.14		
	Bind. twine	A.	9.8	.50	4.90			Threshing	Bu.	414.0	.07	28.98		
								Haul to mkt.	Cwt.	237.0	.05	11.85		
Totals	Materials and Supplies					158.47	1986	2516	Contract labor					749.50
									Cash expense for general farm labor					
									 months at \$85.00					
									990 Man hours at 40c					396.00
									 horse hours at 10c					
Total expense, materials and supplies						158.47			Total cash out for labor					1145.50

¹ Includes all direct labor in crop production except contract labor.

² It is assumed that 10 per cent of the seed requirement will be purchased each year and a seed plot planted from which will come the "first year out of certified" seed for the coming season.

³ Field sacks weigh on the average 110 pounds each.

considerable amount of work around the farm such as cleaning main irrigation ditches, planning operations, marketing crops, and making repairs which is difficult to assign to any one particular crop. Other work of an unexpected nature such as additional labor in curing hay and small grains due to unseasonable rains or the sudden invasion of some insect pest makes for increased demands upon the farmer's time. Previous surveys have indicated that direct labor constitutes only about 75 per cent of the actual labor cost on the farm. Work of this nature has been termed "other" labor and is accounted for in this study by increasing the direct labor by one-third. This amounts to making an allowance of 25 per cent of the entire volume of labor for work not easily anticipated at the time of making the budget. The grower is at liberty to vary this estimate if he feels it is too high or too low to suit his own conditions.

By adding the estimates of direct and indirect labor for each 15-day period the total labor requirement in crop and livestock production for the entire season is approximated. The amount of general farm labor which must be hired is computed by subtracting from these totals estimates of the available labor of the farmer and his family by 15-day periods (*See Table XIX of Appendix I*). Inspection of the amount of labor to be hired and the approximate dates on which it will be needed will determine whether day labor or hire by the month is most feasible. Wages paid by the month are usually somewhat cheaper than day rates, provided there is sufficient work to keep the month hand fully employed. More efficient labor also is usually obtained. In normal times month labor may be profitably employed during slack periods in general improvement work around the farm or the farmer may delegate his own duties to the hired hand and enjoy short periods of leisure. When times are hard, the first recourse of many farmers is to reduce cash expenses by turning off month hands and resorting to hired day labor only when absolutely necessary.

Section D of *Table II* lists all the direct expenses anticipated for the livestock enterprises. It is quite similar in form to Section C on crops, and the amounts and prices of feed purchases should be carefully estimated, particularly where these items constitute a sizable bill of expense.

Section E of the table is designed to care for those items of overhead expense, such as land taxes, water maintenance, upkeep of buildings, fences and machinery, which are common to every farm. Many of these items may be estimated quite accurately. Other such as repairs to buildings and equipment are a little more difficult to anticipate. Possibly the most satisfactory method of handling these expenses is to charge off a definite percentage of the original cost each year for repairs and replacements. In System 1, 10 per cent (\$243.20) of the new value of the farm machinery is charged off (*See Table XXI of appendix for estimated costs of necessary equipment on an 80-acre farm*). The overhead charges remain practically the same under any system of cropping a given farm unless extensive livestock enterprises are introduced or unless special equipment is necessary in the production of certain crops. Valid comparisons therefore may be drawn between several similar set-ups for a given farm whether the estimated upkeep charges include both depreciation and repairs or merely the minimum contemplated cash outlay which will need to be made. In this study the entire upkeep charge is included in order that returns may be measured in terms of farm and labor income. A well-kept farm inventory and expense account are of considerable aid in making accurate forecasts of many items of overhead expense.

Section F of *Table II*, from which the farm and labor income measures are derived, brings together all the estimated receipts and expenses computed in the previous sections of the table. These measures are the bases for

TABLE II—SECTION D

Livestock: Man Labor, Horse Work, Feed and Other Production Requirements in Budget for System 1—1925-30
Average Conditions, Idaho Falls Area, Sandy Loam Soil,
(80 Acres, 1 Man, 4 Horses)—Cont.

Livestock	Man hours	Horse hours	Home grown feeds			Purchased feed and other expenses				
			Kind	Unit	Amt.	Kind	Unit	Amt.	Price per unit 1925-30	Value
Workstock (4)			Alfalfa	Ton	16	Oats	Cwt.	20	Dollars 1.40	Dollars 28.00
Cost of purchased feed										28.00
Total cash expense										28.00

TABLE II—SECTION E

Crops and Livestock: Overhead Charges on Entire Budget Set-up in Budget for System 1—1925-30 Average
Conditions, Idaho Falls Area, Sandy Loam Soil
(80 Acres, 1 Man, 4 Horses)—Cont.

Item	Amount	Price per unit 1925-30	Total cost
Taxes:			Dollars
Personal property .....	.....	.16 per acre	12.80
Land	80 acres	2.35 per acre	188.00
Irrigation water:			
Maintenance	80 acres	.77 per acre	61.60
Upkeep expenses:			
Farm buildings .....	.....	.....	107.00
Potato cellar .....	.....	.....	40.00
Fences .....	.....	.....	17.00
Farm machinery .....	.....	10 per cent of new value (\$2432)	243.20
Farm automobile	12 months	.....	130.00
Fire insurance	\$1000	20 cents per \$100	2.00
Telephone	12 months	2.00 per month	24.00
Workstock	4 head	6.50 per head	26.00
			851.60

TABLE II—SECTION F.
Summary of Expenses and Receipts and Measures of Income in Budget for System 1—1925-1930 Average Conditions—Idaho Falls Area—Sandy Loam Soil.
(80 acres—1 man—4 horses)

Expenses		Receipts	
Item	Amount	Item	Amount
	Dollars		Dollars
Crops (Section C)		Crops (Section A)	5641.76
Materials and Supplies	158.4	Livestock (Section B) .....	.....
Contract labor	749.5		
Cash expense, other hired labor	396.0		
Livestock (Section D)			
Purchased feed and other expense	28.0		
Overhead charges (Section E) ...	851.6		
Total expenses	2183.5	Total receipts	5641.76
		Less total expenses	2183.57
		Farm income	3458.19

Interest on capital:

Real estate

80 acres @ \$150—\$12,000 @ 6%..... 720.00

Working capital

Machinery: 8/15 of new value (\$2432)..... \$1297.00

Workstock: 4 horses @ \$65 260.00

Family cows

Total working capital 1557.00

Interest @ 8% on working capital ... 124.56

Total interest on capital..... 844.56 844.56

Labor income 2613.63

For purposes of budgeting it is assumed that the machinery will on the average be half worn out or 8/15 of value new. The average life of horse drawn equipment is about 15 years.

comparing the anticipated profits from several prospective farming plans. Farm income is easily obtained by subtracting total expenses from total receipts. By subtracting from farm income an amount representing interest on the capital invested in the farm, the remainder may be considered a return to the labor of the operator, or labor income. In this study 6 per cent was allowed on the investment in land and 8 per cent on the average investment in equipment and livestock. Here again, in determining the average investment in working capital, a well kept farm inventory would be of material aid.

Limitations and Possibilities in the Budget Method

The budget method has two main fields of usefulness; that of determining the various relationships which operate to make the crop and livestock enterprises of an area hold their respective positions in the competitive scale and, in a more specific sense, applying this knowledge to obtain a combination of enterprises which will yield the greatest profit on a given farm. It is well adapted for use by extension agencies in shaping the agricultural program for an area, and may be even more definitely applied by the farmer to his own conditions.

It is necessarily a method of approximation and the reliability of results obtained will depend primarily on the accuracy attained in estimating the various elements entering into production, the yields which will probably result, the prices at which the products will sell, and the expense involved. The individual farmer, who, through the years has become familiar with the factors of cost and the probable yield of crop and livestock enterprises on his own farm, should experience little difficulty in making close estimates of these items. The greatest chance for error will be in forecasting the probable price for each commodity to be sold.

Research agencies are becoming more familiar with the various factors which influence commodity prices and are gaining ability in forecasting within reasonable limits the probability of high, low, or average returns for the new season. The grower will do well to consider the outlook statements of federal and state agencies in making estimates of the probable returns to be obtained for his products.

The budget analysis is not designed to offer proof of the superiority of one farming system for all farmers in a locality, but when carefully used it does furnish a reliable indication of the probable returns from various contemplated farming plans for any given farm.

When applied to average conditions for an entire area the budget analysis demonstrates the wide variation in income from farming systems in common use. Differences of more than \$1000 in net returns on 80-acre farms are indicated in *Table III* of this study among several of the common cropping systems. Where budgets are based on averages for an area, the farmer should scrutinize carefully the crop yields, cost items, and unit returns to see that they coincide with conditions on his own farm before using them without modification as the basis for planning his own farm program.

Budgets based on prices and costs experienced in previous years are of value in comparing profits which might have occurred under different combinations of crop and livestock enterprises with those actually obtained. Such studies often indicate the farm plan from which best results may be expected in the future. It should be recognized, however, that changing price relationships may materially alter the profit possibilities in a farm plan that has proved highly successful in previous years.

Crop Farming Systems.

Crop farming systems typify the great bulk of the farms on the project. These farms have as their major enterprises, potatoes, sugar beets, wheat, peas and alfalfa. Grain is grown mainly as a nurse crop for alfalfa, red clover, and sweet clover. Besides work stock a few livestock such as three or four cows and enough poultry and hogs for home use are kept. Seasonal surpluses of dairy products, hogs, and eggs are sold to yield a small income. Surplus alfalfa above home feed requirements is usually sold.

In order to simplify the comparisons of different cropping systems, the livestock and poultry kept for home consumption have been left out of the budget calculations. Surplus hay above the needs for work stock is sold, possibly to be fed on the place or to be fed elsewhere on the tract, while the grain is sold for cash in the general market.

A Comparison of Common Systems of Cropping in the Idaho Falls Area

Keeping in mind the limitations placed on the interpretation of budgets based on average conditions, *Table III* is presented to show the estimated average range in incomes from seven of the most commonly used crop rotations in the Idaho Falls area for the years 1925 to 1930 inclusive. The reader is already familiar with System 1 which was used as the sample budget previously discussed. *Table III* shows each field of crop in System 1 matched by a field of the same crop in System 2 except for one field where sugar beets have replaced potatoes. The farm and labor incomes of these two rotations furnish a comparison of the relative profits from potatoes and sugar beets when grown under conditions of Systems 1 and 2 (all fields in the first five systems of *Table III* are the same size, 9.8 acres).

System 1 and System 3 correspond crop for crop except that a field of Perfection peas is substituted in System 3 for the field of sugar beets of System 1. Thus a comparison of the relative profits in Perfection peas and sugar beets is obtained.

Similarly, Systems 1 and 4 correspond in every detail except that Perfection peas are used in System 4 as the nurse crop for alfalfa instead of the wheat used in System 1, affording a comparison between Perfection peas and wheat.

System 5 is similar to System 1 except that one of the fields devoted to potatoes in System 1 is replaced by Perfection peas in System 5, furnishing a comparison between potatoes and peas. Two six-year rotations, Systems 6 and 7, are most commonly used in the New Sweden district of the Idaho Falls area. They are introduced here to furnish a comparison between 6 and 7-year rotations and to see if any significant difference in profit results when wheat or peas are used as the nurse crop for alfalfa.

Table III shows differences of as much as \$1100 among estimated labor incomes resulting from different combinations of the same crops on this 80-acre farm for the years 1925 to 1930 inclusive. When alternative crops differ widely in net returns the difference between failure and success may largely depend on the judgment exercised by the farmer as to the emphasis placed on each crop. It is apparent that variations among cropping systems in the items of expense and interest on capital are comparatively slight. Labor incomes, however, show considerable variation and total receipts among systems differ as much as \$1400.

There is no significant difference in the labor incomes from Systems 1 and 4, which appear to be the two most profitable cropping plans, during the 1925-30 period. Referring to the top of *Table III* for a description of the rotations, it is seen that these two systems differ only in the use of wheat

TABLE III
Comparison of Estimated Incomes From 7 Crop Rotations on the Sandy Loam Soils of the Idaho Falls Area;
1925-30 Average Conditions. (80 acre farms, 1 man, 4 horses).

Item	1	2	3	4	5	6	7
	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields	1 Alfalfa, 3 fields
	Potatoes, 2 fields	Potatoes, 1 field	Potatoes, 2 fields	Potatoes, 2 fields	Potatoes, 1 field	Potatoes, 2 fields	Potatoes, 2 fields
	Beets, 1 field	Beets, 2 fields	Peas, 1 field	Beets, 1 field	Beets, 1 field	Peas, 1 field	Wheat, 1 field
	Wheat, 1 field	Wheat, 1 field	Wheat, 1 field	Peas, 1 field	Peas, 1 field	1 field	
	1 field	1 field	1 field	1 field	Wheat, 1 field		
Capital	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Real estate	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Working capital	1,557.00	1,557.00	1,557.00	1,557.00	1,557.00	1,557.00	1,557.00
Total	13,557.00	13,557.00	13,557.00	13,557.00	13,557.00	13,557.00	13,557.00
Receipts							
Crops	5,641.76	4,924.76	5,098.20	5,744.83	4,381.20	5,499.89	5,378.68
Livestock							
Total	5,641.76	4,924.76	5,098.20	5,744.83	4,381.20	5,499.89	5,378.68
Expenses							
Crops							
Materials & supplies	158.47	142.21	195.86	219.38	180.68	220.26	149.56
Contract labor	749.50	891.43	475.50	763.97	617.43	504.41	487.41
Cash expense for							
general farm labor	396.00	305.40	435.30	446.80	347.10	508.40	448.40
Livestock							
Purchased feed and							
other expense	28.00	28.00	28.00	28.00	28.00	28.00	28.00
Overhead charges	851.60	851.60	851.60	851.60	851.60	851.60	851.60
Total	2,183.57	2,218.64	1,986.26	2,309.75	2,024.81	2,112.67	1,964.97
Farm income	3,458.19	2,706.12	3,111.94	3,435.08	2,356.39	3,387.22	3,413.71
Interest on capital	844.56	844.56	844.56	844.56	844.56	844.56	844.56
Labor income	2,613.63	1,861.56	2,267.38	2,590.52	1,511.83	2,542.66	2,569.15

Each field is 9.8 acres in size (i.e. alfalfa 3 fields equals 9.8 multiplied by 3 equals 29.4 acres).

* Each field is 11.4 acres in size.

† Interest is charged at the rate of 6 per cent on real estate and 8 per cent on working capital.

or Perfection peas as a nurse crop for the seeding of new alfalfa. Under the conditions assumed in the budgets there was apparently little difference in profits from one nurse crop over the other, and the grower would have done well to have selected the one which in his experience produced the best stand of alfalfa. Since the 1925-30 period, however, wheat has taken a drastic drop in price while the contract price for seed peas has remained substantially at the old levels. Under these altered conditions Perfection peas would produce considerably larger returns than wheat as the nurse crop, provided a satisfactory contract for seed pea production could be obtained.

Both these "largest profit" systems during the 1925-30 period have three-sevenths of the land in alfalfa, two-sevenths in potatoes, one-seventh in sugar beets, and one-seventh in wheat or peas.

The two six-year rotations, Systems 6 and 7, having half the land in alfalfa, one-third in potatoes, and one-sixth in Perfection peas or wheat, produce substantially the same labor incomes as Systems 1 and 4 previously discussed. During the 1925-30 period, then, it would appear that any one of these four systems would have given almost equally desirable results. Individual years during this period would probably show certain of these four systems more profitable than others, but for average conditions over the six-year period average profits would appear quite similar. Systems 6 and 7 may maintain the soil fertility somewhat better than Systems 1 or 4 because only three rather than four crops are taken before the land is re-seeded to alfalfa.

It is characteristic of all four of these systems that from one-half to two-thirds of the land devoted to annual crops is producing potatoes each year. The relative yields and prices obtained during the 1925-30 period combined to make Idaho potatoes unquestionably the most profitable cash crop in the area. At different levels of potato prices this relationship is subject to change. During 1931, potato prices were so low that other crops gained the ascendancy, and those cropping systems which gave greater emphasis to the production of sugar beets and peas proved most profitable.

System 3, which differs from System 1 in the substitution of a field of Perfection peas for one of sugar beets, produces a labor income smaller by approximately \$350 than that of System 1. Thus is afforded a comparison of the relative profits from sugar beets and Perfection peas during the 1925-30 period for the conditions laid down in the budgets.

System 2 shows a labor income over \$750 smaller than that of System 1, due to the substitution of a field of sugar beets for one of potatoes.

The smallest labor income is found in System 5 where the practice was to grow only one field of each annual cash crop. Here, only one-fourth of the land producing annual crops was planted to potatoes and the opportunity to realize on their superior income during the 1925-30 period was lost. The very conservatism of this system, however, placed it in a much more favorable light in 1931, when returns from the potato enterprise were unsatisfactory.

In years of prospective low returns, the grower does well to consider carefully those crop and livestock combinations which call for the least cash outlay. In *Table III*, materials and supplies, contract labor, and cash expense for general farm labor are obviously out-of-pocket expenditures. The greatest difference among systems in the cost of materials and supplies is \$78. A variation of \$416 is noted in costs of contract labor, and \$203 in cash expended for general farm labor in the different systems. In the budget analysis consideration should be given, with due regard to good practice, to those farm plans which utilize most the available home labor, thus reducing the amount to be hired to a minimum.

Table IV is similar to *Table III* except that the 1931 year is shown

TABLE IV.

Comparison of Incomes from 7 crop Rotations on the Sandy Loam Soils of the Idaho Falls Area; 1931 Year.
(80-acre farm—1 man—4 horses)

Item	1 1 Alfalfa, 3 fields Potatoes, 2 fields Beets, 1 field Wheat, 1 field	2 1 Alfalfa, 3 fields Potatoes, 1 field Beets, 2 fields Wheat, 1 field	3 1 Alfalfa, 3 fields Potatoes, 2 fields Peas, 1 field Wheat, 1 field	4 1 Alfalfa, 3 fields Potatoes, 2 fields Beets, 1 field Peas, 1 field	5 1 Alfalfa, 3 fields Potatoes, 1 field Beets, 1 field Peas, 1 field Wheat, 1 field	6 2 Alfalfa, 3 fields Potatoes, 2 fields Peas, 1 field	7 2 Alfalfa, 3 fields Potatoes, 2 fields Wheat, 1 field
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Capital:							
Real estate	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Working capital	1,512.00	1,512.00	1,512.00	1,512.00	1,512.00	1,512.00	1,512.00
Total	13,512.00	13,512.00	13,512.00	13,512.00	13,512.00	13,512.00	13,512.00
Receipts:							
Crops	2,553.49	2,924.99	2,170.04	2,895.39	2,541.54	2,383.47	1,984.77
Livestock							
Total	2,553.49	2,924.99	2,170.04	2,895.39	2,541.54	2,383.47	1,984.77
Expenses:							
Crops:							
Materials and supplies	121.54	120.50	157.04	180.56	157.08	175.30	106.79
Contract labor	556.06	706.77	325.72	572.93	476.43	345.31	325.55
Cash expense for general farm labor	272.25	211.40	302.08	307.18	244.48	349.78	308.55
Livestock:							
Purchased feed and other expenses	17.80	17.80	17.80	17.80	17.80	17.80	17.80
Overhead charges	843.10	843.10	843.10	843.10	843.10	843.10	843.10
Total	1,810.75	1,899.57	1,645.74	1,921.57	1,738.89	1,731.29	1,601.79
Farm income	742.74	1,025.42	524.30	973.82	802.65	652.18	382.98
Interest on capital ³	840.96	840.96	840.96	840.96	840.96	840.96	840.96
Labor income	-98.22	184.46	-316.66	132.86	-38.31	-188.78	-457.98

¹ Each field is 9.8 acres in size (i.e. alfalfa 3 fields equals 9.8 acres multiplied by 3 equals 29.4 acres).

² Each field is 11.4 acres in size.

³ Interest charged at the rate of 6 per cent on real estate and 8 per cent on working capital.

rather than the 1925-30 average. In periods when prices of agricultural products are fairly stable and the costs of labor, material, and supplies are not given to violent fluctuations, it may be safe to assume that the farm organization which has been built up through the years is still the most profitable. When levels of prices and costs undergo violent changes, it becomes necessary to consider carefully ways and means of reorganization and recombination of farm enterprises that may mean the difference between failure and success.

Systems that proved most profitable during the 1925-30 period are now superseded by others, and profits are materially reduced or effaced entirely. Of the annual crops; under average yields, prices, and costs for the six-year period 1925-30; potatoes ranked first, sugar beets second, wheat third, and Perfection peas fourth in order of relative profits; while in 1931 sugar beets ranked first, Perfection peas second, potatoes third, and wheat fourth. Those systems which included relatively more of the land in sugar beets and peas and less in potatoes and wheat proved generally more profitable in 1931. Since both sugar beets and seed peas are grown under contract in the Idaho Falls area, the grower had a fair indication of the stability of this condition if it were possible to obtain satisfactory production contracts in 1932.

Table V is of primary interest to the research agency or extension man wishing to correct the labor incomes shown in *Table III* for changed price or cost relationships. It affords an easy method for bringing the budgets of *Table III* quickly up to date. An illustration will serve to make clear the use of the table:

If the price of wheat in 1931 dropped to \$1.00 per hundred-weight, it would be necessary to correct for 66 cents, as the price of wheat used in the budgets of *Table III* was \$1.66 per hundred-weight (see third column of *Table V*). *Table V* indicates that for each change of one cent in the per hundredweight price of wheat a change of \$3.95 is registered on the labor income of System 1. Since this is a 66 cent change, the labor income will be affected by 66 times \$3.95 or \$260.70. As the change was a decrease in price, this amount is subtracted from the labor income of System 1 of \$2614.00 as given at the bottom of the table. Other corrections may be made in like manner.

Year to Year Variations in Income on the Same Farm

In a primarily cash crop area subject to wide variations in yearly returns, it is well to study average incomes from different cropping systems over a period of years. The knowledge of those combinations, taken one year with another, which yield the largest average returns is of considerable value in planning for the new year. Another phase of nearly equal importance in planning is an appreciation of the extent to which receipts and expenses may fluctuate in a given year. Where wide yearly fluctuations may be expected, the grower must build up reserves in years of good returns to meet the exigencies of lean years if he expects to stay in the business. The purchase for cash of equipment which needs replacement, the making of needed repairs when money is available, and otherwise fortifying the position by increasing bank balances and purchasing governmental or other securities carrying but little risk, is eminently more desirable in most cases than the alternative adopted by so many farmers: the assuming of increased obligations through the purchasing of small equities in more land. Fig. 3 *Table VI* shows the estimated year by year returns for the 7-year period 1925-31 on an 80-acre farm following the crop rotation of System 1.

TABLE V

Adjustment to Figures in Table IV for Changes in Prices of Crops and Cost of Contract and Hired Day Labor
For the Systems of Farming Described.

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IDAHO AGRICULTURAL EXPERIMENT STATION

Crop	1925-30 avg.		Amount of change in prices	Add or subtract from labor income as given:						
	price used in budget			System 1	System 2	System 3	System 4	System 5	System 6	System 7
	Unit	Dollars		Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Potatoes										
No. 1's and 2's	cwt.	1.25	.01	28.01	14.01	28.01	28.01	14.01	32.58	32.58
Sugar Beets	ton	7.23	.05	6.80	13.60	.....	6.80	6.80	.....	.....
Beet tops	ton of beets	.40	.01	1.36	2.72	.....	1.36	1.36	.....	.....
Perfection peas	cwt.	2.83	.01	.....	.....	1.75	1.75	1.75	2.03	.....
Alfalfa	ton	8.67	.05	4.05	4.05	4.05	4.05	4.05	4.85	4.85
Wheat	cwt.	1.66	.01	3.95	3.95	3.95	.....	3.95	.....	4.59
Contract labor on crops	1925-30 avg. cost used in budget		Amount of change in cost							
Potatoes										
Picking	sack	.07	.01	30.87	15.44	30.87	30.87	15.44	35.91	35.91
Hauling to market	cwt.	.05	.01	32.20	16.10	32.20	32.20	16.10	37.45	37.45
Beets										
Thinning	acre	8.00	.50	4.90	9.80	.....	4.90	4.90	.....	.....
Hoeing twice	acre	4.00	.25	2.45	4.90	.....	2.45	2.45	.....	.....
Topping and loading	ton	.96 1/2	.01	1.36	2.72	.....	1.36	1.36	.....	.....
Hauling to dump	ton	.60	.01	1.36	2.72	.....	1.36	1.36	.....	.....
Peas										
Threshing	bu.	.14	.01	.....	.....	3.32	3.32	3.32	3.87	.....
Hauling to market	cwt.	.05	.01	.....	.....	1.99	1.99	1.99	2.32	.....
Wheat										
Threshing	bu.	.07	.01	4.14	4.14	4.14	.....	4.14	.....	4.81
Hauling to market	cwt.	.05	.01	2.37	2.37	2.37	.....	2.37	.....	2.76
Hired day labor	hour	.40	.01	9.90	7.52	10.68	11.17	8.21	12.69	11.21
Basic labor income as given				2614.00	1862.00	2267.00	2591.00	1512.00	2543.00	2569.00

TABLE VI

Estimated Yearly Incomes for System 1 on the Sandy Loam Soils of the Idaho Falls Area; 1925-31 Inclusive,
(80-acre farm—1 man—4 horses)

Item	Alfalfa 3 fields—potatoes 2 fields—beets 1 field—wheat 1 field											
	29.4 acres—				19.6 acres—				9.8 acres—			
	1925	1926	1927	1928	1929	1930	1931	1925	1926	1927	1928	1929
Capital												
Real estate	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Working capital	1,577.00	1,557.00	1,577.00	1,557.00	1,557.00	1,577.00	1,512.00	1,577.00	1,557.00	1,577.00	1,577.00	1,512.00
Total	13,577.00	13,577.00	13,577.00	13,557.00	13,557.00	13,577.00	13,512.00	13,577.00	13,557.00	13,577.00	13,577.00	13,512.00
Receipts												
Crops	8,989.27	6,358.90	4,176.41	3,431.77	7,299.83	3,576.70	2,553.49					
Livestock .....	.....	.....	.....	.....	.....	.....	.....					
Total	8,989.27	6,358.90	4,176.41	3,431.77	7,299.83	3,576.70	2,553.49					
Expenses												
Crops												
Materials and supplies	158.35	187.22	170.76	146.29	143.86	157.45	121.54					
Contract labor	775.61	775.61	744.74	754.26	750.12	732.84	556.06					
Cash expense for general farm labor	396.00	396.00	396.00	396.00	396.00	396.00	272.25					
Livestock												
Purchased feed and other expenses	28.20	25.00	31.40	33.00	30.40	19.80	17.80					
Overhead charges	851.60	851.60	851.60	851.60	851.60	851.60	843.10					
Total	2,209.76	2,235.43	2,194.50	2,181.15	2,171.98	2,157.69	1,810.75					
Farm income	6,779.51	4,123.47	1,981.91	1,250.62	5,127.85	1,419.01	742.74					
Interest on capital	844.56	844.56	844.56	844.56	844.56	844.56	840.96					
Labor income	5,934.95	3,278.91	1,137.35	406.06	4,283.29	574.45	-98.22					

Interest charged at the rate of 6 per cent on real estate, 8 per cent on working capital.

The chief significance in *Table VI* is the extreme fluctuation in crop returns when contrasted with the relative stability through the years in both the current and overhead expenses of production. These data are based on strict adherence to a cropping system calling for three fields of alfalfa, two fields of potatoes, and one field each of beets and wheat every year. In actual practice growers are prone to vary widely the acreage in different crops in response to changes in price. Potato growers tend to make marked increases in the potato acreage the year following a season of good prices and tend toward almost as drastic reductions the year following one or two of poor potato prices. It should now be possible by utilization of State and Federal outlook material for the better-than-average farmer to produce his heavy potato crop in the year of good prices with some degree of consistency. The better-than-average farmer, however, sees beyond the immediate gain and is also interested in keeping up soil fertility by the adoption of and adherence to a definite crop rotation. While conditions arising from time to time may dictate the emphasis placed on the competing cash crops within a rotation, the emergency will indeed be great before the soil building crop is sacrificed. The measurement of incomes over a period of years where growers governed crop acreage by a year late response to price changes as contrasted with growing a definitely scheduled amount of each crop each year would probably show that the greatest total income would result in the latter case (See Idaho Experiment Station Bulletin 188, page 29, for this comparison).

In figuring the individual budgets by years for System 1 no account has been taken of the probability of yearly variations in the per cent of number 1's and number 2's in grading the potato crop. There seemed to be no accurate way of measuring the amount of this variable factor, so the average grade of 65 per cent number 1's and 22 per cent number 2's was applied to the budget for each year. In years of small potato supplies there is a tendency to grade less strictly and many potatoes that would grade number 2 when prices are less favorable are allowed in the number 1 grade. The same tendency in grading applies to seed peas. Any arbitrary correction for yearly variations in grade, therefore, would widen still further the yearly fluctuation shown in *Table VI*.

Comparison of Relative Profits in Competing Crops

Alfalfa is grown in the Idaho Falls area as a soil builder and the small grains are used for the most part as nurse crops. This leaves potatoes, sugar beets, and seed peas as the main competing cash crops in the area.

Violent fluctuations in labor incomes from year to year have been demonstrated in *Table VI*. Further analysis has disclosed the fact that extreme variations in the prices received for farm crops are mainly responsible for this situation. It remains to determine which crops in the Idaho Falls area are most subject to violent price changes.

The crop rotations described in *Tables III* and *IV* have been set up to facilitate comparisons among crop enterprises. A field by field comparison of Systems 1 and 2 shows both systems to be alike in all respects except that beets are substituted for potatoes in one field in System 2. Any difference in income between the two systems therefore measures the difference in returns from raising 9.8 acres of beets instead of 9.8 acres of potatoes.

The following direct comparisons may be made among crop Systems 1 to 5, since the fields are all the same size and the organization among systems compared is always the same with the exception of a single crop:—

1. Systems 1 and 2—compare a 9.8 acre field of sugar beets with a

9.8 acre field of potatoes.

2. Systems 1 and 3—compare a 9.8 acre field of sugar beets with a 9.8 acre field of Perfection peas.
3. Systems 1 and 4—compare a 9.8 acre field of wheat with a 9.8 acre field of Perfection peas.
4. Systems 1 and 5—compare a 9.8 acre field of potatoes with a 9.8 acre field of Perfection peas.
5. Systems 3 and 4—compare a 9.8 acre field of wheat with a 9.8 acre field of sugar beets.
6. Systems 4 and 5—compare a 9.8 acre field of potatoes with a 9.8 acre field of wheat.

Having determined the comparisons to be made among cropping systems, the analysis itself is quite simple. The labor income for System 1 during the 1925-30 period averaged \$2613.63 (*See Table III*). The corresponding labor income for System 2 was only \$1861.56. The difference of \$752.07 between these incomes is due to raising 9.8 acres of beets in System 2 instead of 9.8 acres of potatoes. Dividing this difference by 9.8 it is found that beets averaged \$76.74 less per acre than potatoes during the 1925-30 period and under the conditions of this study. Making a positive statement it may be said that on the average the potato enterprise returned \$76.74 more labor income per acre than beets during the six years studied.

Similar calculations from comparisons among the budget systems produce the following approximate relationships which existed among the main competing crops in the Idaho Falls area during the 1925-30 period:—

Potatoes were \$77.00 more profitable per acre than beets.

Potatoes were \$110.00 more profitable per acre than wheat.

Potatoes were \$112.00 more profitable per acre than Perfection peas.

Since the budget method is at best a series of approximations, there is more interest in the relative ranking of the various competing crops than in the dollars and cents values quoted.

It is safe to conclude for conditions assumed in the budgets that potatoes averaged the most profitable during this 6-year period, followed in order by sugar beets, wheat, and Perfection peas.

A similar analysis of the data in *Table IV* for 1931, when price relationships of these crops had undergone drastic changes, discloses an entirely new set of relationships. During 1931, returns on potatoes were so unsatisfactory that they were superseded in profits by both sugar beets and Perfection peas. Relationships existing among the main competing crops in Systems 1 to 5 of this study in 1931 may be expressed as follows:—

Sugar beets were \$22.00 more profitable per acre than Perfection peas.

Sugar beets were \$29.00 more profitable per acre than potatoes.

Sugar beets were \$46.00 more profitable per acre than wheat.

In 1931, therefore, these crops may be ranked in order of profits with sugar beets first, followed in order by Perfection peas, potatoes, and wheat. While these comparisons are necessarily limited to the conditions assumed in cropping Systems 1 to 5 of this study, it is believed that quite similar relationships among competing crops were existent over much of the Idaho Falls area during the two periods under consideration. Farmers who in 1931 gave the same emphasis to potato production as in previous years of more stable conditions paid heavy penalties for this error in judgment.

During the 1925-30 period an average difference in returns of \$112 per acre is shown between the most profitable and least profitable of the

main competing crops. In 1931 this difference had narrowed to \$46 per acre and those crops which averaged less profitable during the six years 1925-30 now ranked as most profitable. This serves to emphasize the necessity of testing the contemplated farm plan at the beginning of each season before assuming its continued superiority over others.

Effects of Labor Distribution on Profits

An important principle in the profitable combination of crops is illustrated in Fig. 1. The highest yields on any crop can be expected only

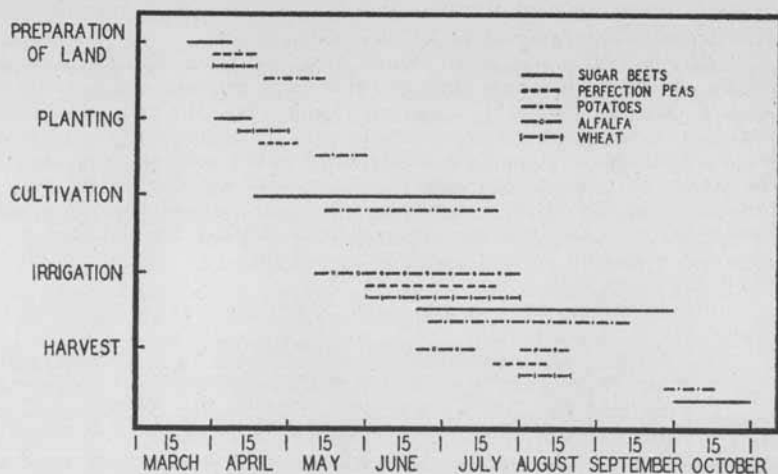


Fig. 1.—Most common range in dates of performing work on crops as estimated by farmers, Idaho Falls area, 1930. The threshing of peas and wheat is excluded from harvest operations as shown since it may be postponed for some little time without injury under normal weather conditions in this locality.

when the ground has been prepared and planted within certain very definite time limits in the spring and the harvesting completed during other equally well defined periods. Inspection of Fig. 1 shows a serious conflict in that the preparation of the ground for planting Perfection peas and wheat occupies the same time in which sugar beets should be planted. It is obvious that any combination of sizable acreages of these three crops will make it necessary to hire additional help with its attendant cash outlay, or one or more crops must be slighted at the expense of the others, resulting in reduced yields on the crops planted late. In the spring every farmer is busy with the rush work of "getting the crops in," and the utilization of exchange labor is not as practical as it becomes later in the growing season.

While there is always a best time for doing each cultural operation, many jobs during the growing season may be postponed for short periods without serious results, in order to permit the performance of work of a more pressing nature. When the harvest season approaches, however, the demands of the individual crop on the time of the grower again become very significant. Fig. 1 indicates a concentration of harvest work during August on the second cutting of alfalfa, the binding of wheat, and the harvesting of Perfection peas. During October, sugar beet and potato harvests demand the same period of time. Since much of the harvest work

on sugar beets and potatoes is performed by contract, this conflict is not as serious as would at first appear.

The impression should not be gotten that one may entirely avoid the concentration of work at certain seasons of the year, or that the necessity of hiring added help at these periods is always a great evil. Fig. 1 is presented merely to emphasize those crops which compete for the farm labor supply under Idaho Falls conditions and to indicate how proper combinations of these crops will result in less cash expenditure for hired labor, higher crop yields, and consequently greater net profits than other less well organized cropping systems.

In organizing a farm for greatest profit, consideration should be given to the maximum utilization of available family labor in an effort to reduce to a minimum the cash outlay for hired labor.

There are only two short periods from the middle of March to the middle of October when the time of one man is not fully employed on the 80-acre farm of System 1. In every month from May through October additional labor in greater or lesser amounts is necessary. While there are many advantages in keeping a well trained and dependable man hired by the month, he could be profitably employed only a portion of the time on this farm. On the whole, it would appear wiser to meet the demands for outside labor in this case by hiring help by the day when needed or by resorting to exchange work; a well developed practice in haying and threshing in the Idaho Falls area.

In judging the merits of day versus month labor two important points should not be overlooked:

1. Day wages are generally somewhat higher than wages by the month. In the Idaho Falls area, during the period 1925-30, a common day wage was 40 cents per hour or \$4.00 per day. At the same time month hands were receiving a total wage (including perquisites) of \$85 per month. Figuring 26 working days per month, the day wage on a month basis would be \$104, or \$19 more than the month wage.
2. Day wages are generally cash while part of the month wage is usually made up of such perquisites as board and lodging.

Effect of Size of Business on Profits

Table VII taken from census data gives an indication of the sizes of

TABLE VII

Per Cent of Farm Land Represented by Farms of Difference Size Groups in Bonneville County, Idaho, by Census Periods.

Size of farms	1920	1925	1930
	Per cent	Per cent	Per cent
Under 3 acres	.41	.72	.13
3-9	1.49	2.86	1.84
10-19	1.49	2.53	2.22
20-49	14.12	15.00	13.57
50-99	27.70	34.61	36.14
100-174	25.41	22.14	23.40
175-259	8.71	6.49	6.53
260-499	16.21	11.04	8.50
500-999	3.85	3.31	4.25
1000-4999	.47	1.04	3.23
5000-and over	.14	.26	.19
Total number of farms	1480	1540	1577

farms most commonly selected by the farmers of Bonneville county. The largest group in each census period is that of farms 50 to 99 acres in size, the majority being 80-acre farms. The next largest class represents farms of 100 to 174 acres in size, most of these being 120-acre farms. A concentration of some importance is found in the grouping of farms 20 to 49 acres in size, mostly 40-acre tracts. The farms shown in the classifications above 260 acres are chiefly dry-land grain farms included in the county. The upper limit in the amount of land which can be operated by one man is reached much more quickly under irrigated than dry farming conditions. In the Idaho Falls area the majority of irrigated farms tend to fall into three size groups of 40, 80, or 120 acres.

A study of the relative profits on farms of these size groups for years of favorable and unfavorable potato prices is presented in *Table VIII*. The same 7-year rotation is carried through on all three farms. The equipment which is necessary to farm 40 acres will be nearly adequate for 80 acres and represents about two-thirds of the investment necessary for equipping 120-acre farms. Working capital as shown in *Table VIII* includes the investments in equipment and workstock. Investments per crop acre in working capital are \$3.58 for the 40-acre farm, \$2.27 for the 80-acre, and \$1.95 on the 120-acre farms. This heavy burden of overhead expense places the smaller farms at a distinct handicap in competing with farms of larger sizes.

A comparison of the items of receipts and expenditures on farms of the same size in 1925 and 1928 shows only slight variations in expenditures but extreme fluctuations in receipts.

In 1925, the year of good potato prices, total expenses were only about 25 per cent of gross receipts. With much reduced incomes in 1928 when potato prices were extremely low, nearly 65 per cent of the gross receipts were needed to pay the expenses of production. If the farm is fully paid for, the grower has, in addition to the labor income, the amount set aside as interest on capital on which to live. The extreme contrast in returns in these two periods strongly emphasizes the necessity for building up reserves in good years to assist in weathering through poor seasons in areas where the main cash crop is subject to violent yearly fluctuations. Within reasonable limits of size the larger farms are more likely to obtain some semblance of a living wage in years of extremely poor returns. Farmers on abnormally small acreages are almost forced to reduce the standard of living to survive the lean years.

As farms increase in size there is a tendency for a larger part of the expenses of production to become cash costs. An approximation of the cash and non-cash expenditures on these farms shows 71, 81, and 85 per cent of the entire cost to be cash outlay on farms of 40, 80, and 120 acres in size. As the acreage is enlarged the amount of hired labor rapidly increases which accounts for most of the difference in cash costs on the larger farms. It is estimated that a total of approximately 137 hours of labor must be hired on the 40-acre farm, 990 hours on the 80-acre, and 1963 hours on the 120-acre farm under discussion.

Since exactly the same rotation is followed on each of these farms and the same amount of family labor is available, a comparison of the amount of hired labor per crop acre will prove of interest. Four hired-man hours per crop acre on the 40, 14 hours on the 80, and 20 hours per crop acre on the 120-acre farm are the estimated amounts. On only one, the 120-acre farm, is the labor demand sufficiently large to justify the hiring of a man by the month for part of the growing season.

The best size of farm will vary for different farmers. In the same type of farming the farm of best size for a grower with two grown sons and \$25,000 to invest will very likely be different than the best size for a single

man with \$5000 capital. Where the farming type calls for heavy investments in equipment, and land is relatively cheap, it usually pays to farm nearly up to the maximum capacity of the equipment. In extreme cases, duplication of certain items of equipment may even be justified. Where land is higher priced and the equipment outlay of relatively minor importance, the proper size may depend on the resources in capital and family labor at the grower's disposal. Chief disadvantages inherent in an insufficient volume of production on small farms of any type are the high burdens of overhead expense and low upper limits of possible returns in even the best years. When the farm is large enough to ameliorate these difficulties, further adjustments in size depend on the grower's managerial ability and resources in family labor, in capital, and in the available supply of suitably located land.

Ways of Maintaining Soil Fertility Under Crop Farming Systems

While the maintenance of soil fertility is generally associated with livestock enterprises on the farm, there are other means of maintaining soil fertility indefinitely. A few growers in the area studied follow the practice of sowing sweet clover with grain or peas. The stand becomes firmly established by fall and is allowed to produce about a foot to a foot and a half growth in the spring, when it is turned under as a green manure crop and potatoes are planted. When only one cultivated crop is grown before reseeding to sweet clover, this plan compares favorably with the plan of growing alfalfa hay three years in a seven-year rotation. This plan of using sweet clover is well adapted to the man who does not like livestock or who is not in a position to keep livestock, but who is proficient in growing grain, peas, and potatoes.

Some growers offer to haul hay and other feeds free if they can induce men to conduct feeding operations on the farm. During the winter months labor is cheap and much valuable manure is obtained in this way. Other growers buy manure piles from those who value a little ready cash more than an increased crop yield in the distant future. Frequently large bands of sheep are wintered in the foothills adjacent to the alfalfa supply of irrigated farms. Such winter feeding quarters often provide much manure to be had for the hauling.

Super-phosphate fertilizer has been used profitably to increase the yield of sugar beets in this area. It may become sound practice to purchase other kinds of commercial fertilizers as their capacity for increasing yields and improving quality on the different soils becomes known.

Crop rotations in irrigated areas are for the most part built around alfalfa as the main soil-improving crop. In a careful study in southern Montana covering a period of 14 years, potatoes were found to yield an average of 220 bushels per acre in a rotation alternating with sugar beets.¹ In a rotation of sugar beets (1 year), alfalfa (2 years), and potatoes (1 year), the potato yield averaged 268 bushels per acre or 22 per cent higher for the same period. Other rotations in which the effect of alfalfa on potato yields was studied gave still more striking results. Similar findings were obtained in studying the effect of alfalfa on the yield of sugar beets.

When alfalfa is cut for hay it is doubtful if the nitrogen fixing properties of the plant and the decay of its large tap roots much more than compensate for the loss of organic matter removed in the hay. Alfalfa cannot be expected to materially add to the soil resources unless the top growth also is returned to the soil. Its ability, however, to contribute sufficient organic matter, even when used as a hay crop, to prevent serious soil depletion and at

¹ United States Department of Agriculture Technical Bulletin 144—Irrigated Crop Rotations in Southern Montana.

TABLE VIII.

Effect of Size of Business on Income in Years of Favorable and Unfavorable Potato Prices. (The same 7-year rotation carried through on 40, 80, and 120 acre Farms on the Sandy Loam Soils of the Idaho Falls Area.)

Item	Alfalfa—3 fields — Potatoes—2 fields Beets—1 field — Wheat—1 field ¹					
	1925			1928		
	Average price of potatoes \$2.43 per cwt. ²			Average price of potatoes \$0.45 per cwt. ²		
	40 acres	80 acres	120 acres	40 acres	80 acres	120 acres
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Capital						
Real Estate	6,000.00	12,000.00	18,000.00	6,000.00	12,000.00	18,000.00
Working capital	1,252.00	1,557.00	1,879.00	1,252.00	1,557.00	1,879.00
Total	7,252.00	13,557.00	19,879.00	7,252.00	13,557.00	19,879.00
Receipts						
Crops	4,551.92	8,989.27	12,648.03	1,716.91	3,431.77	4,822.25
Livestock .....	.....	.....	.....	.....	.....	.....
Total	4,551.92	8,989.27	12,648.03	1,716.91	3,431.77	4,822.25
Expenses						
Crops						
Materials and supplies	80.40	158.35	222.67	74.30	146.29	205.73
Contract labor	400.99	775.61	1,092.81	392.50	754.26	1,062.78
Cash expense for general farm labor	54.00	396.00	709.20	54.00	396.00	709.20
Livestock						
Purchased feed and other expense	21.15	28.20	42.30	24.75	33.00	49.50
Overhead charges	636.48	851.60	1,064.12	636.48	851.60	1,064.12
Total	1,193.02	2,209.76	3,131.10	1,182.03	2,181.15	3,091.33
Farm income	3,358.90	6,779.51	9,516.93	534.88	1,250.62	1,730.92
Interest on capital ³	460.16	844.56	1,230.32	460.16	844.56	1,230.32
Labor income	2,898.74	5,934.95	8,286.61	74.72	406.06	500.60

¹ Acreages in crops were: Alfalfa Potatoes Beets Wheat Waste
40 acre farms 15 10 5 5 5
80 acre farms 29.4 19.6 9.8 9.8 11.4
120 acre farms 41.4 27.6 13.8 13.8 23.4

² Potato prices are average wagon load cash to growers at Idaho Falls from September to May, figuring 65 per cent No. 1 and 22 per cent No. 2 as salable.

³ Interest charged at the rate of 6 per cent on real estate and 8 per cent on working capital.

the same time improve the physical condition of the soil, has earned for it just popularity.

In the Idaho Falls area alfalfa is most commonly left three or four years in a rotation. In view of weevil infestation being more severe in the older stands of alfalfa, a tendency may develop toward plowing up alfalfa after the second or third full year of production. This would permit shortening the common rotations from seven to six years and by reducing the alfalfa acreage one-third would operate to increase the amount of land available for the main cash crops. However, this practice would no doubt reduce yields to some extent.

The seven-year rotation of System 1 as used in this study devotes approximately 43 per cent of the crop land to alfalfa, 29 per cent to potatoes, and 14 per cent each to sugar beets and wheat. The same rotation with one less year of alfalfa would have in round numbers 33 per cent of the crop land in alfalfa, 33 per cent in potatoes, and 17 per cent each in sugar beets and wheat.

Were such a six-year system worked out for comparison with the seven-year rotations used in this study one would expect an increased labor income during the 1925-30 period due to increasing the acreage in what was then the most profitable crop. In 1931 the tables would be reversed and System 1 would show a greater loss than is shown in *Table IV*.

Any farmer adopting a system which devotes one-third of the crop acreage to a crop subject to such extreme fluctuations as Idaho potatoes must check his farm plan very carefully at the beginning of each season to avoid disaster.

Summary and Conclusions for Crop Farming Systems

When seven crop rotations commonly used in the Idaho Falls area were applied to the same 80-acre farm under average costs and returns as calculated from the 1925-30 period, there were variations of as much as \$1100 among the resulting labor incomes.

The same seven rotations subjected to conditions of cost and price prevailing in 1931 gave very different results. The range in labor incomes narrowed to \$663 and crop combinations which proved most profitable in 1931 were frequently those which made the least favorable showings during the 1925-30 period. When price and cost relationships alter measurably, this comparison clearly emphasizes the necessity for readjustment of the farm plan if maximum profits are to be realized.

Assuming an 80-acre farm in the Idaho Falls area, and adopting the cropping plan of System 1, variations of over \$6000 among annual incomes were estimated in a study of the individual years during the 1925-31 period.

Of the three main competing crops in the area, prices of sugar beets and Perfection peas have varied but little. Russet potatoes are, however, subject to violent price changes which are responsible for most of the extreme fluctuations in labor incomes experienced in this area.

In spite of the extreme variability in Russet potato prices during the 1925-30 period, the return per acre of crop on potatoes averaged nearly three times that on sugar beets and far above returns on Perfection peas or wheat. Since it seems logical to continue the production of Russet potatoes as the main crop, growers must adopt the principle of building up reserves in years of good potato prices to aid in weathering through unfavorable years to which the industry will probably always be subject.

In a cash crop area, with prices and costs subject to marked variations, any guide the grower may use in finding some indication of the profits which will probably accrue to various contemplated farming systems should

be of considerable value. The budget method, combined with local interpretations of the outlook information made available in February of each year, should prove an effective tool in planning for the year ahead on any farm. The method illustrated in this bulletin is easily followed by growers familiar with the production requirements and probable yields of crops on their own farms.

While the budget method, when based on carefully prepared averages, will show in a general way those combinations of crop and livestock enterprises best adapted to a given area, it has its greatest use and is most reliable when applied to the specific problems of a single farm.

In addition to indicating profitable combinations of crop and livestock enterprises for the year ahead, the budget analysis furnishes for the farmer's guidance such items of significance as the following:

1. The estimated amount of cash necessary for operating expenses and the different periods during the year at which it will be needed.
2. The way in which labor is distributed during the year, enabling the grower to plan for timely performance of work with maximum utilization of available home labor and the minimum cash outlay for hired help.

The last few decades have been characterized by vast improvements in methods of transportation and in the grading, standardizing, and distributing of farm products. Commodities formerly confined within the boundaries of the county in which they were produced now appear on the tables of consumers on the other side of a continent. The present organization of agricultural production is such that farmers are continually subjected to an increasing pressure of competition. Under such conditions it is believed that budget analyses or other accounting measures must necessarily be adopted by those growers who would continue in production.

General Farming Systems.

The previous section has been devoted to Crop Farming Systems which typify the great bulk of the farms on the project. These farms keep few livestock the year around and the surplus alfalfa above home feed requirements usually is sold to sheepmen or cattle feeders to be fed on the farm or on neighboring farms. Differing from Crop Farming Systems are those shown under this section of General Farming Systems. Here livestock is treated as a year-around farm enterprise and the problems of planning a farm program with livestock are illustrated by the budgets offered.

It would be difficult to find a farm near the Idaho Falls area which does not raise alfalfa as the main soil-building crop. For this reason, all budgets of this study include alfalfa in their rotations. Since alfalfa weevil is prevalent, a quarantine has been placed on the area and no alfalfa hay may be shipped out except in the form of alfalfa meal. So far the market for alfalfa meal has been limited. These conditions confine the potential alfalfa market to the boundaries of the area itself or nearby infested areas. Some form of livestock production or feeding must be carried on or the market for alfalfa would soon disappear. In the latter event, annual legume and green manure crops would be required for soil maintenance to replace most of the alfalfa acreage. Since farmers are familiar with alfalfa production and since there are extensive ranges in this part of Idaho, it is apparent that alfalfa will remain one of the important crops and that some form of livestock production and feeding is desirable in the area.

On most of the farms in this section, the production of livestock has

been confined to a relatively subordinate position. Two or three cows and a small flock of chickens, kept mainly to supply the family needs, are the common practice. Occasionally farmers have intensified the commercial production of dairy products, sheep, hogs, or poultry to a position of relative importance. Allowing for a few exceptional farms, among which are those producing market milk or purebred breeding stock, it has not paid, in recent years, to expand livestock to the point where the maximum long-time production of cash crops has been curtailed. The wintering of range sheep absorbs much of the alfalfa and other feed supplies. The present adjustment of livestock to crop farming, is, in the main, one that is directed by fairly good management and common sense in an area devoted primarily to production of cash crops. One cannot ignore, however, the tendency among some farmers to exhaust the soil by devoting too large a percentage of their available acreage to cash crops. The budgets which follow illustrate the problems involved in budgeting livestock enterprises for crop farms.

Budgeting the Farm Business With a Livestock Enterprise

To make direct comparisons of incomes from different kinds of livestock as simple as possible, enough dairy cattle in the one case and enough sheep in the other have been inserted into Crop System 1¹ to consume all surplus hay and pasture and most of the other available roughages and waste feeds. For further comparison a budget has been calculated with enough hogs to consume approximately all the grain raised as a nurse crop. Crop System 1, where the surplus hay and roughage have been sold, may also be used for comparison of livestock enterprises because most hay and roughages sold are fed to range ewes on the farm. Table IX gives the budget containing dairy cattle for 1925-30 average conditions. The budgets with sheep and hogs may be constructed in the same manner. Crop System 1, where range ewes may be wintered, has been budgeted in Table II for the same period.

Attention is now directed to Section A of Table IX which gives the acreage, production, and disposal of crops for the budget with dairy cattle. The dairy herd is large enough to consume all the hay, pasture, surplus roughages, (except beet tops) and part of the grain from this 80-acre farm. The inclusion of this livestock has involved a shift in Crop System 1; that is, some of the acreage of alfalfa to pasture, and of wheat to barley. It has not been necessary to change acreages of the cash crops—potatoes and sugar beets.

The acreage of alfalfa hay and grass pasture shown in Section A, Table IX, was apportioned to provide hay for the horses and to feed all the dairy cattle, which can be pastured on the land which remains. These acreage requirements may be approximated, but a better method is to follow a system of computations. See page 33 of Idaho Bulletin Number 188 or consult your county agent or write to the Extension Farm Economist, Boise, for detailed directions. These computations will show that 21 acres of alfalfa hay will balance 8.4 acres of mixed grass pasture for dairy cattle (where four horses are provided for by the hay acreage). For a farm flock of sheep the proportion of pasture to hay will be much greater. The feeding rations used also have a direct bearing on the required acreages of hay and pasture. The amounts of feed here used per cow are found in Section D of Table IX and in Table XXII, page 63 of Appendix II. Table XXII also shows the feed used per unit of sheep and hogs. See Table XXIII of Appendix II for other production requirements. The same method and care followed in budgeting Crop System 1 in Table II will apply in budgeting systems which

¹ Crop System 1 has been budgeted on pages 9, 10, 12 and 13 under Crop Farming Systems.

TABLE IX—SECTION A.

Crops: Acreage Production and Disposal in Budget for System 1—1925-30 Average Conditions—Idaho Falls Area—Sandy Loam Soil.

(80 acres—1 man—4 horses)

Livestock: Enough dairy cattle to consume hay, pasture and by-products.

Crop	Acres in crop	Unit	Production		Disposal				
			Per acre	Total	Farm use		Amt.	Sales	
					Feed	Seed		Price per unit 1925-30	Value
								Dollars	Dollars
Alfalfa	21.0	Tons	3.30	69	69	....	....	....	....
Pasture (mixed)	8.4	Acres	(for cows)			....	....	....	....
Potatoes	19.6	Cwt.	173.25	3396		176	3220		
No. 1—65 per cent							2093	1.40	2930.20
No. 2—22 per cent							708	.815	577.02
Culls—13 per cent				419	378			....	....
Beets	9.8	Tons	13.90	136			136	7.22	981.92
Beet tops								40c per ton of beets	54.40
Barley	3.8	Bu.	50.00	190	178 ²	8	4	.56	2.24
Wheat	3.2	Bu.	42.20	135		6	129	.99	127.71
Pasture (seeded alone)	2.8		(late summer and fall pasture)						
Total	68.6 ¹								4673.49

¹ Wasteland-farmstead, road, creek banks, etc. equal 11.4 acres.

² Barley has been calculated at 50 pounds per bushel.

include livestock. Accuracy in calculations and estimates is necessary to obtain useful comparisons of probable income.

Section B of *Table IX* pertains to the kind, number, and production of the livestock. In addition, it supplies the same kind of estimates for livestock which is found in Section A for crops. In this sample budget, productivity of the cows has been assumed to be an average of 300 pounds butterfat per cow per year. One bull has been maintained and enough young stock have been kept to take care of death losses and to provide replacements for the 14-cow dairy. Five heifer calves have been saved to permit the selection of the best four. The other calves have been killed at birth. Three cull cows have been sold on the average each year. Here, as with crops, care should be exercised in estimating the probable production and the probable prices of products in order to arrive at reasonably accurate estimates of returns. See *Table XXIV* of Appendix II for prices received for livestock and livestock products 1925-31.

Section C of *Table IX* gives the direct expenses for the crops in terms of quantities of seed, materials, and labor used, together with the cost of each item and the total cost of all items. To estimate the hired labor requirements for crops in Section C, the same method and care should be used as is described on Page 8 for Section C of *Table II*. Where livestock is important as in this budget under discussion, any labor on the livestock which interferes with the field work of the farmer or which the farmer or family cannot do before or after the hours devoted to field work, should be added to the labor requirements of the crops in arriving at the total labor requirements for the farm. From these figures the necessary amount of hired labor should be estimated. However, in Section C of this budget the extra hired labor costs which have arisen on account of the dairy have been purposely omitted because it is desirable to make a comparison of the additional labor income realized from the extra labor put in on the dairy, sheep, or hog enterprises when they are budgeted for this same 80-acre farm. This latter method will be most desirable where a farmer has enough family labor to render it unnecessary to hire extra labor on account of livestock enterprises.

Section D of *Table IX* lists the feed requirements and miscellaneous expenses for livestock, and separates the feeds raised from those purchased. Care should be used in entering here all expenses on livestock which can be anticipated.

Section E of *Table IX* contains the overhead expenses and taxes, water maintenance, repairs and depreciation of buildings, fences, and machinery. This section also includes insurance, telephone, etc., as well as replacement costs for work stock and bull. All these items are necessary in arriving at the probable farm income and other measures of income.

Section F of *Table IX* is a summary of the estimates of receipts and expenses found in the other sections of the table. In addition, interest is figured on the investment in land, equipment, and livestock. By deducting the interest, which, in this budget amounts to \$1034.40, from the farm income, a balance of \$2989.22 is obtained. Since this dairy budget is, except for the adjustments made necessary by the dairy, the same as Crop System 1, the amount available to pay for labor on the dairy is obtained by deducting the labor income of Crop System 1 from the balance. The result is an average of \$375.59 available per year to pay for the labor on the dairy for the period 1925-30.

The reasons for and the methods used in taking the steps under the various sections have already been covered in more detail in the discussion of *Table II*, pages 7 to 14.

TABLE IX—SECTION B.
 Livestock—Number, Production and Disposal of Products in Budget for System 1—1925-30 Average Conditions
 Idaho Falls Area—Sandy Loam Soil.

(80 acres—1 man—1 horses)

Livestock: Enough dairy cattle to consume hay, pasture and by-products.

Kind of Livestock	No.	Unit	Production		Disposal			Value
			Per Unit	Total	Livestock	Farm Use	Amount	Price per unit 1925-30
								Dollars
Workstock	4	head					....	....
Dairy Cows	14	head					3	45.00
Butterfat ¹		lb.	300	4200	61.5		3787.5	.47
Butterfat ²		lb.					351	.41
Helpers	4	head					....	....
Calves ³	5	head					....	....
Full	1	head					....	....
Total							....	2059.03

¹ A butterfat test of 4.1 per cent is used in these calculations.

² Butterfat sold as cream.

³ Calves commonly killed at birth except helpers for replacements.

TABLE IX—SECTION C.

Crops, Man Labor, Horse Work, and Other Production Requirements in Budget for System 1—1925-30 Average
Conditions—Idaho Falls Area—Sandy Loam Soil
(80 acres—1 man—4 horses).

Livestock: Enough dairy cattle to consume hay, pasture and by-products.

Crops	Materials and supplies					Labor requirements							
	Kind	Unit	Amount	Price per unit	Value	General farm labor		Contract Labor					
						Man hours	Horse hours	Kind	Unit	Amt.	Price per unit 1925-30	Value	
Alfalfa				Dollars	Dollars	494 ¹	351					Dollars	Dollars
Potatoes	Seed	lbs.	84.0	.27	22.68	842	1332	Picking ²	sack	3087.0	.07	216.09	
	cert. seed ²	cwt.	20.0	1.94	38.80			Haul to mkt.	cwt.	3220.0	.05	161.00	
	Field sacks	acre	19.6	2.57	50.37								
	Formalin	acre	19.6	.11	2.16								
Beets						258	412	Thinning	acre	9.8	8.00	78.40	
	Seed	lbs.	196.0	.15	29.40			Hoeing	acre	9.8	4.00	39.20	
								Top and load	tons	136.0	.96 1/2	131.24	
								Haul to dump	tons	136.0	.60	81.60	
Wheat	Copr. carb.	acre	3.2	.10	.32	139	200	Clean seed	cwt.	7.0	.10	.70	
Barley-wheat	Twine	acre	7.0	.50	3.50			Thresh wheat	bu	135.0	.07	9.45	
Pasture	.....	acre	8.4			159		Thresh barley	bu	190.0	.06	11.40	
Pasture	Seed	acre	2.8	6.87	19.24	53		Haul to mkt.	cwt.	78.0	.05	3.90	
Totals	materials and supplies					166.47	1945	2295	Contract labor				732.98
									Cash expense for general				
									farm labor: 908 hrs. @ 40c				363.20
									 Horse hrs. @ 10c				.....
Total expenses, materials and supplies					\$166.47	Total cash out for labor					\$1096.18		

¹ Includes all direct labor in crop production except contract labor.

² It is assumed that 10 per cent of the seed requirement will be purchased each year and a seed plot planted from which will come the "first year out of certified" seed for the coming season.

³ Field sacks weigh on the average 110 pounds each.

TABLE IX—SECTION D.
 Livestock—Man Labor, Horse Work, Feed and Other Production Requirements¹ in Budget for System 1—1925-30
 Average Conditions—Idaho Falls Area—Sandy Loam Soil.
 (80 acres—1 man—4 horses)

Livestock: Enough dairy cows to consume hay, pasture and by-products.

Livestock	Man hours	Horse hours	Home grown feeds			Purchased feed and other expenses				
			Kind	Unit	Amount	Kind	Unit	Amount	Price Per Unit 1925-30	Value
Workstock (4) Dairy Cows (14)			Alfalfa	tons	16.0	Oats	cwt.	20	Dollars 1.40	28.00
			Alfalfa	tons	42.0	Oats or bran	cwt.	56	1.40	78.40
			Barley	cwt.	56.0	Pea meal	cwt.	56	1.50	84.00
			Potatoes	cwt.	378.0	Beet pulp	tons	8	.60	4.80
Heifers (4)			Alfalfa	tons	7.2	Beet pulp	tons	17	.75	12.75
			Barley	cwt.	14.0	Oats or bran	cwt.	14	1.40	19.60
Calves (5)			Alfalfa	tons	1.1	Oats or bran	cwt.	10	1.40	14.00
			Barley	cwt.	10.0					
Bull (1)			Whole milk	cwt.	15.0					
			Skim milk	cwt.	75.0					
			Alfalfa	tons	2.7					
			Barley	cwt.	11.0					
						Salt	cwt.	10	1.00	10.00
					Grind feed	cwt.	185	.10	18.50	
						Haul milk ²	cwt.	924	.15	138.60
Total cash expenses										408.65

¹ The feed requirements here used are estimates of the feed requirements of dairy cows of this productive capacity by the Department of Dairy Husbandry, University of Idaho.

² Calculated on the basis of 3787.5 pounds of 4.1 per cent whole milk, which makes 92.272 pounds of whole milk to be hauled.

A Comparison of Common Livestock Enterprises in the Idaho Falls Area

The comparisons among livestock enterprises made in *Table X* have the limitations of being based on the average prices and expenses that prevailed in the Idaho Falls area from 1925 to 1930 inclusive. However, they serve to illustrate a method of comparison for livestock enterprises and are an aid in choosing the livestock to keep. It should be remembered that reasonably efficient production of both crops and livestock is assumed in making the above comparisons and that for any particular farm and farmer production will vary from these figures. Most farmers are relatively more efficient with some enterprises than with others.

The reader is already familiar with the method used in budgeting the dairy, sheep, and hog enterprises into Crop System 1 of the Crop Farming Systems. Any differences in capital requirements, receipts, expenses, interest, and the various measures of income are due in these budgets, to the effect of including one particular livestock enterprise rather than another. The income returned to labor on livestock in these budgets gives the best comparison of profitability.

The addition of the dairy enterprise for the years 1925 to 1930 inclusive increased the average annual income by \$375.59 over that obtained when no livestock was included in the farm program. From this amount, however, must be deducted the cost of any additional labor which may be necessary to carry the 14-cow dairy enterprise (See *Table X*). Similar \$286.11 of additional income were available in the sheep budget and \$51.56 in the hog budget as returns for the extra labor required. The amount available to pay for labor on the sheep enterprise was \$234.55 greater than that shown in the hog budget, while the wintering of range ewes gave \$286.11 and \$51.56 less respectively than did sheep and hogs. These differences in income are measures of the differences in the amount available to pay for the labor expended upon these classes of livestock. This is true because in these budgets the cost of required hired labor has been allowed for on crops only and not on livestock. With sheep, hogs, and range ewe enterprises, the amount of hired labor required may be negligible, and will no doubt be much less than for dairy cattle. Fourteen high-producing dairy cows will be difficult for the operator to handle without much family labor or a month hand. If, on account of the dairy, a month hand is hired for seven months, it is estimated that the additional labor would add at least \$225 to \$250 above that necessary for the crop enterprises. Indeed, under these conditions the advantage of \$89.48 in the amount available to pay for the labor on the dairy as compared to that available for sheep will obviously fail to make up for the additional labor cost on the dairy enterprise. In fact, only \$125 to \$150 above that obtained for System 1 with no livestock will remain to pay for the operator's and family labor on the dairy as compared to a probably much larger net return from sheep. This gives sheep first place, dairying second, and hogs third, in average returns for the six-year period, 1925 to 1930 inclusive. If production of more than 300 pounds of butter fat per cow was realized the difference in favor of dairying would be increased to more nearly equal, or if sufficiently high to exceed, the returns from sheep. Greater efficiency may, of course, be obtained with hogs and sheep also.

The general practice in this area of keeping only a few dairy cows, which may be cared for without additional hired labor along with a few sheep or in conjunction with the sale of some of the hay, may yield as large or a larger return for the labor expended than will a dairy herd which requires hired labor. A few hogs kept in conjunction with a dairy herd will

TABLE IX—SECTION E.

Crops and Livestock—Overhead Charges in Budget for System 1—1925-30 Average Conditions—Idaho Falls Area—Sandy Loam Soil.

(80 acres—1 man—1 horses).

Livestock: Enough dairy cattle to consume hay, pasture, and by-products.

Item	Amount	Price per unit 1925-30	Total cost
			Dollars
Taxes ¹ :			
Cattle	14 dairy cows	\$1.50 per head	21.00
Personal property	80 acres	.16 per acre	12.80
Land	80 acres	2.35 per acre	188.00
Irrigation water			
Maintenance	80 acres	.77 per acre	61.60
Upkeep expenses:			
Farm buildings ..		\$137.00 per 80 acres	137.00
Potato cellar		40.00 per 80 acres	40.00
Fences		29.00 per 80 acres	29.00
Farm machinery ..	(\$2432) val. new	10 % of new val.	243.20
Farm auto	12 months		130.00
Fire insurance ..	\$1500	20c per \$100	3.00
Telephone	12 months	\$2 per month	24.00
Dairy equipment ..	Depr. and repairs	13 % of new value	37.00
Work stock	4 head	6.50 per head	26.00
Dairy cattle	Vet., med., etc.		35.00
Bull depreciation ..			50.00
Total overhead charges			1037.60

¹ The average amount of taxes paid for the years 1925-30 inclusive is used. Other cost items appearing in this table are average costs for the same years.

probably tend to increase the returns obtained for the labor expended above that realized when hogs are kept alone. Poultry may also be used in a combination with dairy cattle to increase income.

The efficiency assumed here is no doubt higher than the average for the area, although not as high as the production of most herds in the cow testing associations, or flocks of the best flock masters. The hog enterprise cannot be so directly compared to the other two because of the radically different labor and feed requirements, but the estimates indicate that the additional labor income which could have been derived from this source was relatively insignificant and might be accounted for in errors in the estimates. The returns from wintering range ewes by the sale of roughages to sheepmen were still less, being the same as for Crop System 1 with no livestock; but of course no labor was used and little risk is assumed by the farmer on this enterprise. Keeping the manure on the land probably compensates for the bother of having the sheep about the farm.

In budgeting livestock for the future, budgets based upon the average prices and expenses for the last few years are valuable in discovering the natural or economic advantages which any class of livestock may have in a certain area. Future prices, expenses, and other conditions may change but a following of outlook information will assist the farmer in anticipating any significant changes. Budgeting the farm program will direct attention to the need for adjustments to meet such changes.

The experience and likes of the farmer as well as available family labor may be the deciding factors in choosing a livestock enterprise rather

TABLE IX—SECTION F.

Summary of Expenses, Receipts, and Measures of Income in Budget for System 1—1925-30 Average Conditions—Idaho Falls Area—Sandy Loam Soil.

(80 acres—1 man—4 horses).

Livestock: Enough dairy cattle to consume hay, pasture and by-products.

Expenses		Receipts	
Item	Amount	Item	Amount
	Dollars		Dollars
Crops (Section C)		Crops (Section A)	4673.49
Materials and supplies	166.47		
Contract labor	732.98	Livestock (Section B) ..	2059.03
Cash expense, for general farm labor.....	363.20		
Livestock (Section D)			
Purchased feed and other expenses	408.65		
Overhead charges (Section E)	1037.60		
Total expenses	2708.90	Total receipts	6732.52
		Less total expenses	2708.90
		Farm income	4023.62

Interest on capital:

Real estate		
80 acres @ \$150—\$12,000 @ 6%.....		\$720.00
Working capital		
Machinery: 8/15 of new value (\$2432)	\$1297.00	
Work stock: 4 horses @ \$65	260.00	
Dairy cattle	1583.00	
Dairy equipment	290.00	
Dairy shelter	500.00	
Total working capital.....	\$3930.00	
Interest on working capital @ 8%		314.40
Total interest on capital		1034.40
Balance ¹		2989.22
Labor income for Crop System 1 without livestock		2613.63
Amount available to pay labor on dairy.....		375.59

¹ The extra labor costs which have arisen on account of the dairy have been purposely omitted because it is desirable to make a comparison of the additional labor income realized from the extra labor put in on the dairy, sheep, or hog enterprises when they are budgeted for this same 80-acre farm. Therefore the balance \$2989.22 is a little higher than it would be if calculated in the customary manner for labor income.

TABLE X

A Comparison of Estimated Incomes from Crop System 1¹ with Dairy Cattle or Sheep Enough to Consume Hay, Pasture, and Forage, or with Hogs Enough to consume the Grain, or with Range Ewes which are Wintered on the Farm Through Sale of Surplus Hay and Forage to Sheepmen; on an 80-acre Sandy Loam Farm in the Idaho Falls Area; 1925 to 1930 Average Conditions.

Item	DAIRY 14 cows 4 heifers 5 calves 1 bull	SHEEP 25 ewe lambs 124 ewes 3 rams	HOGS 3 brood sows 27 pigs per year	RANGE EWES wintered on farm by sale of surplus hay and forage
	Dollars	Dollars	Dollars	Dollars
Capital				
Real estate	12000.00	12000.00	12000.00	12000.00
Working capital	3930.00	3163.00	1844.00	1557.00
Total ..	15930.00	15163.00	13844.00	13557.00
Receipts				
Crops ..	4673.49	4567.92	5272.09	5641.76
Livestock ..	2059.03	1574.37	593.27	.....
Total ..	6732.52	6142.29	5865.36	5641.76
Expenses				
Crops				
Materials and supplies	166.47	171.97	158.47	158.47
Contract labor	732.98	725.95	739.40	749.50
Cash expense for general farm labor ²	363.20	350.00	396.00	396.00
Livestock				
Purchased feed and other expenses ..	408.65	85.80	185.98	28.00
Overhead charges	1037.60	935.79	752.80	851.60
Total ..	2708.90	2269.51	2332.65	2183.57
Farm income	4023.62	3872.78	3532.71	3458.19

TABLE X. (Continued)

Item	Dairy	Sheep	Hogs	Range ewes
	14 cows 4 heifers 1 bull 5 calves	124 ewes 25 ewe lambs 3 rams	3 brood sows 27 pigs per year	wintered on farm by sale of surplus hay and forage
	Dollars	Dollars	Dollars	Dollars
Interest on capital ¹	1034.40	973.04	867.52	844.56
Balance ⁴	2989.22	2899.74	2665.19	2613.63
Labor income for crop				
System 1 without livestock	2613.63	2613.63	2613.63	2613.63
Amount available to pay				
labor on livestock enterprise	375.59	286.11	51.56	.....

¹ System 1 which was used as the sample budget in Table III has 7 fields of 9.8 acres each of which 3 fields are in alfalfa, 2 fields in potatoes, 1 field in beets and 1 field in small grain.

² The cost of hired labor on the crops only are allowed here in order that the differences in the labor income between the dairy, sheep and hogs budgets may show the differences in the returns for the labor expended on each of these enterprises. Dairying will ordinarily interfere more with the field work and make necessary hiring of more labor than do sheep and hogs. In budgeting particular farms, estimates can be made on the differences which these enterprises will make in the hired labor expense.

³ Interest is charged at the rate of 6 per cent on real estate and 8 per cent on working capital.

⁴ If additional hired labor is necessary, this item cannot be called labor income because no deductions have been made for hired labor on the livestock.

than available feed and equipment. Furthermore, the amount of available capital may be the deciding factor. The development of efficient livestock enterprises is usually a matter of years, dependent upon securing the requisite experience and capital and in developing a good breeding herd. While some areas are better suited to the profitable production of one kind of livestock than another, comparisons by five-year periods of the past decade or two may show marked differences in returns for different kinds of livestock, all of which may be well adapted to the area. A careful study of production cycles and other outlook information will be helpful in selecting the more profitable livestock for the next few years. A gradual diminution in the returns from cash crops may make livestock gradually more profitable in a certain area, or certain cash crops may become so profitable as to make livestock production a supplementary enterprise for the use of waste feeds and unused labor and to supply manure for maintaining high yields. During recent years the potato and sugar beet crops together have tended to force livestock enterprises into this latter position in the Idaho Falls area.

It is most certainly a mistake to arbitrarily choose a livestock enterprise or to omit livestock from the farm program without carefully budgeting to obtain estimates of the relative profitableness of various available livestock enterprises.

*Year to Year Variations in Income on the Same
Farm With Common Livestock Enterprises*

In an area where all of the common livestock enterprises, dairy, sheep, or hogs, can be made supplementary enterprises to cash crops, it is well to estimate the variation of incomes from these combinations for the past few years. The incomes for the years 1925 to 1931 inclusive after allowing for interest and all expenses (except hired labor for the livestock) are found in *Tables XI, XII, and XIII*. These tables show the rather wide variations in incomes which have prevailed for each of these combinations in recent years. From these figures the grower can conclude that wide variations in income from a farm can be expected in the future in the Idaho Falls area, even though livestock is an important part of the farm program. The potato crop has been largely responsible for wide variations in gross receipts, although the gross receipts from the dairy enterprise in *Table XI* show a variation of from \$2,229.96 in 1925 to \$1,204.74 in 1931. Prior to 1930 the gross receipts from the dairy enterprise varied within narrow bounds, but since the beginning of the depression in 1930 they have been cut almost in half. The amount available to pay for the labor on the dairy also has varied widely from \$493.00 in 1929 to a minus \$70.25 in 1931. *Table XII* shows that the decline in gross receipts from sheep was even more marked, falling from \$1,842.06 in 1925 to \$705.08 in 1931. The amount available to pay for the labor on the sheep varied from \$493.88 in 1928 to a loss of \$176.36 in 1931. See *Table XII*. The gross receipts from the hog enterprise as shown in *Table XIII* were much less than from dairying or sheep, but even so the year to year variations were of considerable importance in increasing or diminishing the income for the farm as a whole. In 1926 hogs brought a gross return of \$720.93, but in 1931 this return had fallen to \$366.85. The amount available to pay for the labor on the hogs was \$151.46 in 1926 and \$144.15 in 1930, but fell to almost nothing in 1928. Space does not permit similar comparisons for feeding lambs and beef cattle for market.

Practical comparisons require the average returns for these various livestock enterprises for a period of years, because unlike cash crops it is not feasible to shift from one kind of livestock to another year by year.

TABLE XI

Estimated Yearly Incomes from Crop System 1 with Dairy Cattle Enough to Consume Hay, Pasture and Forage¹ on an 80 Acre Sandy Loam Farm in the Idaho Falls Area; 1925 to 1931, Inclusive.

Item	1925	1926	1927	1928	1929	1930	1931
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Capital							
Real estate	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00
Working capital	3676.00	3809.00	3925.00	4174.00	4257.00	3742.00	3369.00
Total	15676.00	15809.00	15925.00	16174.00	16257.00	15742.00	15369.00
Receipts							
Crops	7895.49	5382.44	3105.69	2455.11	6401.57	2808.58	1894.55
Livestock	2229.96	2038.03	2088.42	2206.68	2142.42	1687.08	1204.74
Total	10125.45	7420.47	5194.11	4661.79	8543.99	4495.66	3099.29
Expenses							
Crops							
Materials and supplies	165.52	195.58	179.46	155.50	151.20	164.59	129.67
Contract labor	759.09	759.09	728.22	737.74	734.49	718.00	546.40
Cash expense for general farm labor	363.20	363.20	363.20	363.20	363.20	363.20	249.70
Livestock							
Purchased feed and other expenses	409.65	393.65	425.65	433.65	420.65	367.65	347.57
Overhead charges	1037.60	1037.60	1037.60	1037.60	1037.60	1027.60	1004.90
Total	2735.06	2749.12	2734.13	2727.69	2707.14	2641.04	2278.24
Farm income	7390.39	4671.35	2459.98	1934.10	5836.85	1854.62	821.05
Interest on capital ²	1014.08	1024.72	1034.00	1053.92	1060.56	1019.36	989.52
Balance ³	6376.31	3646.63	1425.98	880.18	4776.29	835.26	-168.47
Labor income for crop system 1 without livestock	5934.95	3278.91	1137.35	406.06	4283.29	574.45	-98.22
Amount available to pay labor on dairy	441.36	367.72	288.63	474.12	493.00	260.81	-70.25

¹ The dairy herd consists of 14 cows, 4 heifers, 5 calves and 1 bull.

² Interest charged at the rate of 6 per cent on real estate, 8 per cent on working capital.

³ If additional labor beyond that supplied by the operator is necessary, the estimated cost of this item should be deducted from the balance if labor income is desired.

TABLE XII

Estimated Yearly Income for Crop System 1 with Sheep Enough to Consume Hay, Pasture and Forage on an 80-Acre Sandy Loam Farm in the Idaho Falls Area¹; 1925-31 Inclusive.

Item	1925	1926	1927	1928	1929	1930	1931
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Capital							
Real estate	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00
Working capital	3045.00	3045.00	3045.00	3045.00	3045.00	2673.00	2380.00
Total	15045.00	15045.00	15045.00	15045.00	15045.00	14673.00	14380.00
Receipts							
Crops	7765.65	5268.29	2996.20	2341.71	6297.10	2722.93	1827.24
Livestock	1842.06	1672.58	1612.76	1794.44	1571.90	956.46	705.08
Total	9607.71	6940.87	4608.96	4136.15	7869.00	3679.39	2532.32
Expenses							
Crops							
Materials and supplies	170.50	201.32	185.41	161.78	156.29	169.54	135.25
Contract labor	752.06	752.06	721.19	730.71	728.26	711.92	541.32
Cash expense for general farm labor	350.00	350.00	350.00	350.00	350.00	350.00	240.62
Livestock							
Purchased feed and other expenses	86.00	82.80	89.20	90.80	88.20	70.65	68.65
Overhead charges	939.32	939.32	939.32	939.32	939.32	922.16	910.66
Total	2297.88	2325.50	2285.12	2272.61	2262.07	2224.27	1896.50
Farm income	7309.83	4615.37	2323.84	1863.54	5606.93	1455.12	635.82
Interest on capital ²	963.60	963.60	963.60	963.60	963.60	933.84	910.40
Balance ³	6346.23	3651.77	1360.24	899.94	4643.33	521.28	-274.58
Labor income for crop system 1 without livestock	5934.95	3278.91	1137.35	406.06	4283.29	574.45	-98.22
Amount available to pay labor on sheep	411.28	372.86	222.89	493.88	306.04	-53.17	-176.36

¹ The farm flock consists of 134 ewes, 25 ewe lambs and 3 rams in the fall of each year.

² Interest charged at the rate of 6 per cent on real estate and 8 per cent on working capital.

³ If additional labor beyond that supplied by the operator is necessary the estimated cost of this item should be deducted from the balance if labor income is desired.

TABLE XIII
Estimated Yearly Incomes for Crop System 1 with Hogs Enough to Consume the Grain on an 80-Acre Sandy Loam Farm in the Idaho Falls Area,¹ 1925 to 1931 Inclusive.

Item	1925	1926	1927	1928	1929	1930	1931
Capital							
Real estate	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00	12000.00
Working capital	1844.00	1844.00	1844.00	1844.00	1844.00	1844.00	1799.00
Total	13844.00	13844.00	13844.00	13844.00	13844.00	13844.00	13799.00
Receipts							
Crops	8488.21	5957.57	3802.78	3078.99	6947.68	3341.13	2407.54
Livestock	677.94	720.93	581.89	526.59	543.30	531.38	366.85
Total	9166.15	6678.50	4384.67	3605.58	7490.98	3872.51	2774.39
Expenses							
Crops							
Materials and supplies	158.35	187.22	170.76	146.29	143.86	157.45	121.54
Contract labor	765.51	765.51	734.64	744.16	740.00	723.75	550.00
Cash expense for general farm labor	396.00	396.00	396.00	396.00	396.00	396.00	272.25
Livestock							
Purchased feed and other expenses	185.12	179.08	189.41	189.18	183.46	156.39	133.44
Overhead charges	852.80	852.80	852.80	852.80	852.80	852.80	844.30
Total	2357.78	2386.61	2343.61	2328.43	2316.12	2286.39	1921.53

TABLE XIII (Cont.)

Item	1925	1926	1927	1928	1929	1930	1931
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Farm income	6808.37	4297.89	2041.06	1277.15	5174.86	1586.12	852.86
Interest on capital ²	867.52	867.52	867.52	867.52	867.52	867.52	863.92
Balance ³	5940.85	3430.37	1173.54	409.63	4307.34	718.60	-11.06
Labor income for crop system 1 without livestock	5934.95	3278.91	1137.35	406.06	4283.29	574.45	-98.22
Amount available to pay for labor on hogs	6.40	151.46	36.19	3.57	24.03	144.15	87.16

¹ The hog enterprise consists of 3 sows which farrow three litters each before being sold. This plan results in an average of 27 pigs being raised each year.

² Interest charged at the rate of 6 per cent on real estate, 8 per cent on working capital.

³ If additional labor beyond that supplied by the operator is necessary the estimated cost of this item should be deducted from the balance if labor income is desired.

It is of course valuable in managing the farm to trace the variations in returns from year to year in order to make allowances for these wide differences.

In actual practice growers are prone to vary the size of the livestock enterprises as well as their crop enterprises in response to price changes. With available outlook information farmers should be able to make at least minor adjustments of livestock enterprises to obtain larger returns. With a dairy herd, cows may be culled and heifers raised when prices of cows are high as compared to the price of butterfat, and this practice may be curtailed when cows are low in price. With sheep the grower can refrain from keeping many ewe lambs for the breeding herd when prices are near to or have reached the peak of the cycle. With hogs the enterprise can be enlarged or diminished to fit a favorable relation of grain prices to hog prices or to take care of available waste products.

The Importance of Proper Balance Between Crops and Livestock

The budgets which have been presented under General Farming Systems have contained the maximum number of livestock which can be fed on the feeds raised when a seven-year rotation is followed; that is, one field of grain, three fields of alfalfa, two fields of potatoes, and one field of sugar beets each year. It would be possible to budget less than this number and to sell a portion of the available feed. In fact it is usually better to keep livestock numbers low enough to prevent the purchase of too much feed during years of short hay crops. Of course, where hay may be held over from years of plenty to years of scarcity a full capacity herd or flock may be kept as indicated in these budgets. However, if more livestock than 14 cows for the dairy and 124 ewes for the sheep are kept, it will be necessary in years of lower than average production to buy some alfalfa hay or to rent some pasture. Another plan for increasing the size of the livestock enterprise is to shorten the rotation from seven to six years; that is, one field of grain, three fields of alfalfa or pasture, one field of potatoes, and one field of sugar beets. This rotation increases the production of alfalfa and pasture and permits an increase of about twenty per cent in the number of livestock. This shorter rotation along with more available manure will probably increase yields of crops. But, if the former seven-year rotation maintains indefinitely the yields of crops, it is improbable that the increase in yields can offset the decrease in the returns from the decreased acreage of cash crops, even if supplemented by additional returns from livestock.

The problem of balance for a particular farm in a cash crop area resolves itself into the discovery of the length of rotation which will maintain the largest average long-time total production of the most profitable cash crops for the farm as a whole; with adequate provision for the consumption of the alfalfa and pasture which are necessarily a part of the rotation. More livestock than this or less livestock than this will ordinarily decrease the labor income of the farmer. It has been possible to obtain a modest return for the labor used by maintaining a 14-cow dairy herd on an 80-acre farm without purchase of hay, grain, or pasture. But if this herd should be increased to 20 cows the loss occasioned by the six additional cows would no doubt wipe out all gains from the first 14 cows because of the required decrease in the acreage of cash crops. Likewise, if fewer than 14 cows are kept and some of the hay is sold, an opportunity is foregone to add to the labor income. That many farmers in the Idaho Falls area actually have operated in this latter manner has been due no doubt to lack of funds, experience, initiative, dislike, or a feeling that the returns for the

additional labor expended on livestock have not been sufficiently attractive. If returns for crops become less attractive compared to returns from livestock, this latter reason will become less important in choosing farm enterprises. It is of course, possible during some years to keep profitably more livestock than is shown in the budgets by the purchase of hay, grain, or pasture, or of all of these. However, this can never become a general practice on all farms in an area. Increased yields of alfalfa hay and pasture by use of fertilizers and by improved practices will increase both the number of livestock and volume of cash crops which can be raised on a given farm, but the same problem of balance between livestock and crops will exist regardless of improved practices and greater production.

A certain volume of livestock production has been desirable for the maintenance of the family and the reduction of cash expenses for living. Small surpluses of dairy and poultry products over and above family requirements insure a periodic cash return. Regardless of how meager this may be, or how inefficient the production, it frequently represents the only real cash the farm family has available for a good part of the year. Generally the farmer must spend freely when his crop is sold and he is cramped for funds the balance of the year. Only the more thrifty budget their yearly expenditures and carry cash reserves over from good years to care for lean years. If the livestock is fed entirely on hays, grains, pastures, and waste materials produced on the farm, as is the case in many instances, this type of production can continue indefinitely and may be the salvation of the family involved in times of low prices. This accounts in large measure for the common observation that farmers with livestock seem to weather through hard times in better shape than those with none. Livestock production usually calls for additional capital outlays beyond those necessary for producing crops. It is quite probable that many of those farmers keeping livestock during hard times were in a relatively better financial position in normal times than other farmers lacking the funds to add livestock enterprises.

Summary and Conclusions for General Farming Systems

With alfalfa as the main crop for maintaining soil fertility, it is apparent that some degree of livestock production and feeding is desirable in the Idaho Falls area.

On most of the farms in this section the production of livestock has been confined to a relatively subordinate position of two or three cows and a few chickens, although occasionally some farmers have taken up the commercial production of dairy products, sheep, hogs, and poultry. Many farmers dispose of their available feed by sale to men who range sheep and to cattle men who usually feed on or near the farm. A few farmers have used their feed to finish lambs and beef cattle for the market, and there is now a tendency to increase this practice.

Allowing for a few exceptional farms, it has not paid to expand livestock to the point where the maximum long-time production of cash crops has been curtailed.

Three kinds of livestock, dairy cattle, sheep, and hogs, have been budgeted into an 80-acre, sandy-loam, cash crop farm for the Idaho Falls area for the average 1925-31 conditions. During the years from 1925 to 1931 the gross return realized from dairy, sheep or hogs did not vary greatly for any of them until 1930 and 1931. The decline was moderate in 1930 but in 1931 the gross return had shrunk to about one-half.

The average return for a period of years and not the returns for any

one year is needed to make practical comparisons of livestock enterprises.

If the amounts available to pay for the *labor expended* on the livestock enterprises are compared for the years 1925-30, it is seen that dairying holds first place, sheep second, and hogs third, but if due allowance is made for the extra hired labor required for dairying, sheep have first place, dairying second, and hogs third.

It is most certainly a mistake to arbitrarily choose a livestock enterprise or to omit livestock from the farm program without carefully budgeting to obtain estimates of the relative profitableness of various available livestock enterprises.

In actual practice growers are prone to vary the size of their livestock enterprises as well as their crops enterprises in response to price changes. With available outlook information farmers with established livestock enterprises should be able to make at least minor adjustments to obtain larger returns.

The problem of balance between livestock and crops for a particular farm in a cash crop area resolves itself into the discovery of the length of rotation which will maintain the largest long-time production of the most profitable cash crops with adequate provision for the consumption of the legume crops which are necessarily a part of the rotation. More livestock than this or less livestock than this will ordinarily decrease the labor income of the farmer.

A certain volume of livestock production is desirable to maintain the family and to reduce cash expenses for living. This amount of livestock at least should be kept even though lack of funds, experience, initiative, or dislike prevent the development of efficient commercial production to the optimum balance between cash crops and livestock. This practice will permit the farmer to acquire experience and gradually to overcome other handicaps standing in the way of a proper balance of enterprises.

TABLE XIV

Estimated Weighted Averaged Prices Received by Farmers for Crops in the Idaho Falls Area by Years 1925 to 1931.

Year	Russet Potatoes ¹		Sugar beets ²	Sugar beet tops per ton of beets ²	Wheat ³		Barley ³	Oats ³	Alfalfa hay ⁴	Perfection seed peas ⁵
	No. 1	No. 2								
	Dollars cwt.	Dollars cwt.	Dollars ton	Dollars	Dollars bu.	Dollars cwt.	Dollars cwt.	Dollars cwt.	Dollars ton	Dollars cwt.
1925 ..	\$2.65	\$1.78	\$6.28	.40	\$1.38	\$2.30 ⁶	\$1.14	\$1.26	\$9.00	\$2.75
1926 ..	1.69	.97	7.07	.40	1.09	1.81	.99	1.10	8.50	2.75
1927 ..	.80	.32	7.50	.40	.99	1.65 ⁶	1.31	1.42	10.00	2.75
1928 ..	.55	.14	7.50	.45	.94	1.57	1.19	1.50	9.00	2.75
1929 ..	2.02	1.38	7.50	.38	.95	1.59	1.22	1.37	8.00	2.75
1930 ..	.69	.30	7.50	.38	.61	1.02	.82	.84	7.50	3.25
1931 ..	.44	.09	6.00	.35	.35	.59	.58	.74	7.00	2.75
1925-1930 average	1.40	.82	7.23	.40	.99	1.66	1.11	1.25	8.67	2.83

¹ These prices are weighted average wagonload cash to growers prices at Idaho Falls from September to May for each year except the 1931 prices which are preliminary and from September to April. Data were taken from published reports of the Market News Service of U. S. D. A. for Idaho potatoes.

² Prices were furnished by Utah Idaho Sugar Company, Idaho Falls.

³ These prices were furnished by Midland Elevator Company at Sugar City, and by the Great Basin Grain Company at Idaho Falls.

⁴ Prices of hay were supplied by the Utah Idaho Sugar Company, Idaho Falls.

⁵ These are contract prices paid for hand picked Perfection peas by Rogers Seed Company, Idaho Falls.

⁶ Estimated on basis of relative price levels of oats and barley for years, 1928, 1929 and 1930.

TABLE XV
Prices of Expense Items, Idaho Falls Area 1925 to 1931 and 1925-30 Average.

Item	Unit	Price per unit							
		1925	1926	1927	1928	1929	1930	1931	Average 1925-30
		Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Hired labor:									
Day hands ¹	day	4.00	4.00	4.00	4.00	4.00	4.00	2.75	4.00
Month hands ²	month	85.00	85.00	85.00	85.00	85.00	85.00	70.00	85.00
Feed and fertilizer bought:									
Hay (alfalfa)	ton	9.00	8.50	10.00	9.00	8.00	7.50	7.00	8.67
Oats ²	cwt.	1.41	1.25	1.57	1.65	1.52	.99	.89	1.40
Barley ²	cwt.	1.29	1.24	1.46	1.34	1.37	.97	.73	1.26
Bran	cwt.								
Tankage	cwt.	4.25	4.75	4.50	4.25	4.25	4.00	3.00	4.33
Salt (block)	cwt.	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Seed bought: See Table.....									
Contract work:									
Potatoes:									
Cutting seed	cwt.	.20	.20	.15	.15	.15	.15	.12½	.17
Picking	sack	.08	.08	.07	.07	.07	.07	.05	.07
Hauling to cellar	cwt.	.04	.04	.04	.04	.04	.03½	.03	.04
Hauling to market (5 miles or less)	cwt.	.05	.05	.05	.05	.05	.04½	.03	.05
Sugar beets:									
Thinning	acres	8.00	8.00	8.00	8.00	8.00	8.00	7.00	8.00
Hoeing, first	acres	2.50	2.50	2.50	2.50	2.50	2.50	2.00	2.50
Hoeing, second	acres	1.50	1.50	1.50	1.50	1.50	1.50	1.00	1.50
Topping and loading (14 T. yields)	ton	.93	.93	.93	1.00	1.00	1.00	.88	.96½
Hauling to dump (2 miles)	ton	.60	.60	.60	.60	.60	.60	.48	.60
Wheat, oats and barley:									
Cleaning seed	cwt.	.10	.10	.10	.10	.10	.10	.10	.10
Threshing (farmer puts grain to machine)									
Wheat	bu.	.07	.07	.07	.07	.06	.06	.05	.07
Oats	bu.	.06	.06	.06	.06	.05	.05	.04	.06
Barley	bu.	.06	.06	.06	.06	.05	.05	.05	.06

¹ Figures include the cost of meals given.

² Farm price plus a 15 cent dealers margin.

TABLE XV (Cont'd)
Prices of Expense Items, Idaho Falls Area 1925 to 1931 and 1925-30 Average.

Item	Unit	Price per unit										Average 1925-30 Dollars
		1925 Dollars	1926 Dollars	1927 Dollars	1928 Dollars	1929 Dollars	1930 Dollars	1931 Dollars				
Hauling (5 miles and less)	cwt.	.05	.05	.05	.05	.05	.04½	.03	.05			
Binding	acre	1.50	1.50	1.50	1.50	1.50	1.50	1.25	1.50		1.50	
Peas:												
Threshing (farmer puts peas to machine)	bu.	.15	.15	.15	.13½	.13½	.13½	.12	.14		.14	
Hauling to market (5 miles or less)	cwt.	.05	.05	.05	.05	.05	.04½	.03	.05		.05	
Sacks and twine:												
Potato, field sacks	acre	2.70	2.70	2.90	2.65	2.45	2.00	1.67	2.57		2.57	
Binding twine, 3.6 lbs. used per acre of grain	lb.	.14	.14	.14	.14	.14	.12	.14	.14		.14	
Formaldehyde for treat- ing potato seed	acre	.11	.11	.11	.11	.11	.11	.11	.11		.11	
Copper carbonate for grain Fire insurance	acre	.10	.10	.10	.10	.10	.10	.10	.10		.10	
(Farmer's Mutual)	\$1000	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00		2.00	
Telephone	year	24.00	24.00	* 24.00	24.00	24.00	24.00	24.00	24.00		24.00	
Water: ³												
Maintenance	acre	.77	.77	.77	.77	.77	.77	.77	.77		.77	
Taxes:												
Personal property	acre	.16	.16	.16	.16	.16	.16	.16	.16		.16	
Land	acre	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35		2.35	
Upkeep:												
Auto for farm use	year	130.00	130.00	130.00	130.00	130.00	130.00	115.00	130.00		130.00	
Work horses	head	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50		6.50	
Machinery deprec. and repairs: ⁴												
40 A.		205.00	205.00	205.00	205.00	205.00	205.00	197.00	205.00		205.00	
80 A.		246.00	246.00	246.00	246.00	246.00	246.00	237.00	246.00		246.00	
120 A.		278.00	278.00	278.00	278.00	278.00	278.00	267.00	278.00		278.00	

TABLE XV. (Continued)

Item	Unit	Price per unit							
		1925	1926	1927	1928	1929	1930	1931	Average 1925-30
		Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Buildings	40 A.	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
	80 A.	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
	120 A.	124.00	124.00	124.00	124.00	124.00	124.00	124.00	124.00
Fences	40 A.	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
	80 A.	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
	120 A.	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00

² The maintenance charges here listed are the average charges for three irrigation districts comprising 88,400 acres. Construction charges are considered capital investments and are not charged to annual cost.

⁴ The depreciation and repairs of machinery is figured at 10 per cent of cash value of new machinery.

TABLE XVII
Most usual range in dates of performance of field operations on crops
in the Idaho Falls Area, Sandy Loam Soils¹

Crop	Operation	Times		Dates of Performance			
		Over					
Potatoes	Plow	1		Apr. 20	..	May 10	
	Harrow	2		Apr. 20	..	May 10	
	Level	1		Apr. 23	..	May 13	
	Cut and treat seed	1		May 6	..	May 27	
	Plant	1		May 10	..	May 30	
	Plank	1		May 13	..	May 30	
	Harrow	2		May 16	..	June 1	
	Cultivate or list	5	Begin	May 17	End	July 22	
	Irrigate	6	Begin	June 24	End	Sept. 13	
	Dig and pick	1		Sept. 27	..	Oct. 16	
	Haul to cellar	1		Sept. 27	..	Oct. 16	
Perfection							
Seed Peas	Plow	1		Apr. 1	..	Apr. 15	
	Harrow	2 to 4		Apr. 1	..	Apr. 15	
	Level	1		Apr. 3	..	Apr. 13	
	Dike	1		Apr. 3	..	Apr. 18	
	Drill	1		Apr. 18	..	May 3	
	Corrugate	1		Apr. 18	..	May 3	
	Irrigate	3		June 1	..	July 20	
	Mow and roll	1		July 20	..	Aug. 10	
	Bunch	1		July 20	..	Aug. 10	
	Haul to thresher	1		Aug. 1	..	Aug. 30	
Beets	Plow	1		Mar. 20	..	Apr. 5	
	Harrow	4		Mar. 20	..	Apr. 5	
	Level	1		Mar. 23	..	Apr. 8	
	Plant	1		Apr. 1	..	Apr. 15	
	Roll or cultipack	1		Apr. 16	..	May 5	
	Cultivate or						
	furrow	6	Begin	Apr. 20	End	July 20	
	Thin	1		May 1	..	May 20	
	Hoe	2	Begin	June 10	End	July 20	
	Irrigate	7	Begin	June 20	End	Sept. 30	
	Lift	1		Oct. 1	..	Nov. 1	
	Top and load	1		Oct. 1	..	Nov. 1	
Alfalfa	Irrigate	7	Begin	May 10	End:-		
				6th irrigation		July 30	
				7th irrigation		Aug. 20-Sept 6	
	First Crop:						
	Cut	1		June 20	..	July 10	
	Rake	1		June 20	..	July 10	
	Bunch	1		June 20	..	July 10	
	Stack	1		June 23	..	July 13	
	Second Crop:						
	Cut	1		Aug. 1	..	Aug. 15	
	Rake	1		Aug. 1	..	Aug. 15	
	Bunch	1		Aug. 1	..	Aug. 15	
	Stack	1		Aug. 3	..	Aug. 18	
Small Grain	Plow	1		Apr. 1	..	Apr. 15	
	Harrow	2		Apr. 1	..	Apr. 15	
	Level	1		Apr. 3	..	Apr. 13	

TABLE XVII. (Continued)

Crop	Operation	Times Over	Dates of Performance
	Dike	1	Apr. 3 .. Apr. 18
	Drill	1	Apr. 10 .. April 30
	Irrigate	4 Begin	June 1 End:
			3rd irrigation July 30
			4th irrigation Sept. 1-15
	Bind	1	Aug. 1 .. Aug. 20
	Shock	1	Aug. 1 .. Aug. 20
	Haul to thresher	1	Sept. 1 .. Sept. 20

The number and kind of operations on crops varies some from farm to farm on the same soil type, but these production requirements tend to become customary and to have a distinct modal average. The differences in results is more in the skill with which the operations are performed, and in the timeliness of the performance. With the intensity of cultivation relatively fixed in a certain area, it is feasible and safe to use the common kinds and average number of operations in budgeting various enterprise combinations for purposes of comparison. Increasing the intensity of cultivation very often gives insignificant increases in production unless the intensity is increased by a very much greater input. On virgin soil these great increases in input will not often be justified by returns.

TABLE XVIII

Field Operations, Idaho Falls Area: Acres Normally Covered per 10 Hour Day and Hours of Direct Man and Horse Work Required per Acre; Each Operation Performed Once.¹

Operation	Number	Size of imple- ment	Crew		Acres per 10 hour day	Hrs. per acre	
			Men	Horses		Man	Horse
Plowing	331.5	14"	1	3	2.6	3.87	11.61
Plowing	340.5	16"	1	3	2.7	3.78	11.34
Plowing	275.3	16"	1	4	2.9	3.48	13.92
Plowing, alfalfa ^b .....	.....	16"	1	4	1.9	5.26	21.04
Plowing, alfalfa	est.	14"	1	4	1.8	5.39	21.54
Harrowing, spike	1,711.0	2 sec.	1	3	16.1	.62	1.86
Harrowing, spike	2,147.4	2 sec.	1	4	16.6	.60	2.40
Harrowing, spike	2,588.4	3 sec.	1	4	27.0	.37	1.48
Harrowing, spike ² .....	.....	4 sec.	1	6	36.0	.28	1.68
Leveling	639.0	8'	1	4	13.9	.72	2.86
Leveling	368.0	9'	1	4	15.1	.66	2.64
Leveling	647.3	10'	1	4	15.7	.64	2.56
Rolling or cultipacking	134.0	7' & 8'	1	2	13.5	.74	1.48
Rolling or cultipacking	131.8	9' & 10'	1	2	15.1	.66	1.32
Disking	254.0	.....	1	2	.....	.36	.72
Corrugating (for peas & small grains)	311.0	4 & 5 row	1	2	10.0	1.00	2.00
Planking	214.5	.....	1	2	19.0	.53	1.06
Cutting, treat- ing and haul- ing potato seed (est.) ..	.....	.....	.....	.....	.....	4.50	1.00
Planting:							
Potatoes	719.0	1 row	1	2	4.8	2.09	4.18
Sugar beets ..	622.7	4 row	1	2	13.9	.72	1.44
Peas	152.0	6' & 7'	1	3	10.4	.96	2.88
Peas	317.5	6' & 7'	1	4	10.7	.94	3.76
Small grains ..	123.0	6' & 7'	1	3	12.3	.82	2.46
Small grains ..	532.5	6' & 7'	1	4	12.5	.80	3.20
Cultivating or listing pota- toes	1,062.0	1 row	1	2	5.9	1.69	3.38
Cultivating or furrowing beets	655.7	4 row	1	2	11.9	.84	1.68
Irrigating:							
Potatoes	659.5	.....	1	.....	.....	1.91	.....
Sugar beets ..	579.7	.....	1	.....	.....	1.33	.....
Peas	635.0	.....	1	.....	.....	2.11	.....

TABLE XVIII (Cont.)

Field Operations, Idaho Falls Area: Acres Normally Covered per 10 Hour Day and Hours of Direct Man and Horse Work Required per Acre; Each Operation Performed Once.¹

Operation	Number acres aver- aged	Size of imple- ment	Crew		Acres per 10 hour day	Hrs. per acre	
			Men	Horses		Man	Horse
Small grains	925.5	.....	1	....	....	1.52	....
Alfalfa	954.6	.....	1	....	....	1.15	....
Harvesting:							
Potatoes:							
Digging	571.5	1 row	1	4	3.2	3.12	12.48
Hauling to cellar	537.0	.....	....	....	....	6.17	7.65
Sugar beets:							
Lifting	300.4	1 row	1	2	2.2	4.63	9.26
Peas:							
Mowing and rolling	582.0	5'	1	2	6.2	1.61	3.22
Bunching ..	671.0	.....	1	....	3.4	2.94	....
Hauling to thresher ..	667.5		6 to 15	8 to 18	....	6.27	6.69
Small grains:							
Binding	552.0	6'	1	3	10.6	.94	2.82
Shocking ..	913.0	.....	1	....	6.9	1.45	....
Hauling to thresher ..	711.5	.....	7 to 16	8 to 18	....	5.12	4.99
Alfalfa ² :							
Cutting	660.0	5'	1	2	10.0	1.01	2.02
Raking	457.0	10'	1	2	14.5	.69	1.38
Bunching ..	509.0	.....	1	....	6.4	1.57	....
Stacking ..	685.0	.....	2 to 7	2 to 8	....	4.46	4.96

¹ Cleaning ditches and applying manure are not considered because of the extreme variability in amount and kind of work done from farm to farm.

² Taken from Twin Falls study.

³ Average yield of 3.3 tons per acre in two cuttings on Sandy loam soil.

TABLE XIX
Direct Man and Horse Labor Requirements—per Acre by 15-Day Periods—Idaho Falls Area, 1930.
(80 acre farms)

Date	Beets		Peas		Small grains		Systems 1, 3, 4, 6, 7 ¹		Systems 2 and 5 ¹		Alfalfa	
	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
March:												
16 to 30	3.94	13.15	....	....	....	....	....	....	....	....	....	....
April:												
1 to 15	2.68	8.11	5.82	18.93	5.56	17.88	....	....	....	....	....	....
16 to 30	1.17	2.33	1.64	4.82	.76	2.90	3.00	11.01	3.38	13.56	....	....
May:												
1 to 15	1.01	2.03	.37	1.07	....	....	5.64	12.52	6.00	14.82	.50	....
16 to 30	.83	1.66	....	....	....	....	6.91	10.97	6.91	10.97	1.28	....
June:												
1 to 15	.83	1.66	1.90	....	1.14	....	1.92	3.84	1.92	3.84	1.28	....
16 to 30	1.86	1.66	1.90	....	1.14	....	2.92	3.84	2.92	3.84	4.68	3.67
July:												
1 to 15	2.21	1.66	1.90	....	1.14	....	4.07	3.84	4.07	3.84	5.61	4.69
16 to 30	1.66	.56	3.01	1.69	1.14	....	3.05	1.79	3.05	1.79	1.28	....
August:												
1 to 15	1.38	....	5.31	4.88	1.80	2.12	2.15	....	2.15	....	6.89	7.43
16 to 30	1.38	....	3.13	3.34	.59	.70	2.15	....	2.15	....	1.58	.93
September:												
1 to 15	1.38	....	....	....	5.36	3.74	1.86	....	1.86	....	.41	....
16 to 30	1.38	....	....	....	1.28	1.25	1.85	4.03	1.85	4.03	....	....

TABLE XIX (Cont.)
Direct Man and Horse Labor Requirements—Per Acre by 15-Day Periods—Idaho Falls Area, 1930.
(80 Acre Farms)

Date	Beets		Peas		Small grains		Potatoes				Alfalfa	
	Man	Horse	Man	Horse	Man	Horse	Systems 1, 3, 4, 6, 7 ¹		Systems 2 and 5 ¹		Man	Horse
	Hours	Hours	Hours	Hours	Hours	Hours	Man	Horse	Man	Horse	Hours	Hours
October:												
1 to 15	2.32	4.63	....	....	....	....	6.97	15.10	6.97	15.10	....	....
16 to 30	2.31	4.63	....	....	....	....	.47	1.00	.47	1.00	....	....
November:												
1 to 15	....	....	....	....	....	....	....	....	....	....	....	....
Total hours ²	26.34	42.08	24.98	34.73	19.91	28.59	42.96	67.94	43.70	72.79	23.51	16.72

¹ Systems 1, 3, 4, 6, 7 half the potato land plowed out of alfalfa, systems 2 and 5, all potato land plowed out of alfalfa.

² The following work is done by contract in addition to that shown in this table: thinning, hoeing, topping and load-
ing beets; machine work in threshing small grains and peas; picking and grading potatoes; and hauling all crops
to market. Increase each total by 1/3 to approximate total of direct and other labor exclusive of contract work.

TABLE XX
Man Labor Requirements on 29.4 Acres of Alfalfa, 19.6 Acres of Potatoes, and 9.8 Acres Each of Sugar Beets and Wheat as Grown in System 1 on the Sandy Loam Soils of the Idaho Falls Area.¹

PROFITABLE FARMING FOR THE IDAHO FALLS AREA

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Date	Alfalfa	Potatoes	Sugar Beet	Wheat	Total hours direct labor	Total hours other labor ²	Total labor	Avail-able home labor ³	Amount of labor to be hired
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
March:									
16 to 30	.....	.....	38.61	.....	38.61	12.87	51.48	100	.....
April:									
1 to 15	.....	.....	26.26	54.49	80.75	26.92	107.67	100	7.67
16 to 30	.....	58.80	11.47	7.45	77.72	25.91	103.63	100	3.63
May:									
1 to 15	14.70	110.54	9.90	.....	135.14	45.05	180.19	130	50.19
16 to 30	37.63	135.44	8.13	.....	181.20	60.40	241.60	130	111.60
June									
1 to 15	37.63	37.63	8.13	11.17	94.56	31.52	126.08	130	.....
16 to 30	137.59	57.23	18.23	11.17	224.22	74.74	298.96	130	168.96
July:									
1 to 15	164.93	79.77	21.66	11.17	277.53	92.51	370.04	130	240.04
16 to 30	37.63	59.78	16.27	11.17	124.85	41.62	166.47	130	36.47
August:									
1 to 15	202.57	42.14	13.52	17.64	275.87	91.96	367.83	130	237.83
16 to 30	46.45	42.14	13.52	5.78	107.89	35.96	143.85	130	13.85
September:									
1 to 15	12.05	36.46	13.52	52.53	114.56	38.19	152.75	130	22.75
16 to 30	.....	36.26	13.52	12.54	62.32	20.77	83.09	130	.....
October:									
1 to 15	.....	136.61	22.74	.....	159.35	53.12	212.47	115	97.47
16 to 30	.....	9.21	22.64	.....	31.85	10.61	42.46	115	.....
Total hours for season	691.18	842.01	258.12	195.11	1986.42	662.15	2648.57	...	990.46

¹ The following work is done by contract in addition to that shown above:-- thinning, hoeing, topping and loading beets, machine work in threshing grain, picking potatoes and hauling all crops to markets.

² An allowance of one third of the direct labor or 25 per cent of the entire labor is added for such work as farm chores, cleaning irrigation ditches, burning weeds in fence rows, and other work not easily anticipated at the time of making the budget.

³ The labor of the operator only is assumed to be available as follows:--10 days in March; 20 days in April; 26 days in May, June, July, August, and September; 23 days in October; and 15 days in November. Family labor other than the operator was found to be too negligible and too variable a quantity to consider.

TABLE XXI
Estimated Cost of Equipment for an 80 Acre, Horse Powered Farm,
Idaho Falls Area.

Equipment	Number	Size	1931 Prices	1925- 1930 Prices
Plows:				
Two-way	1	16"	\$ 130	\$ 145
Walking	1	14"	22	32
Harrow, spike	1	3 sec.	49	52
Harrow, springtooth	1	5'	45	45
Cultipacker or roller	1	8'	100	100
Planker (homemade)	1	10'	5	5
Corrugator (homemade)	1	10'	10	10
Float (homemade)	1	8' to 10'	15	15
Miskin scraper	½ share		67	67
Slip scraper	1		14	14
Martin ditcher	½ share		30	30
Drills:				
Grain	1	7'	212	212
Potato planter	1	1 row	112	112
Cultivators:				
Potato and attachments	1	1 row	86	86
Beet	1	4 row	133	133
Garden	1	1 row	10	10
Binder, grain	1	6'	237	280
Potato digger	1	22"	165	165
Beet lifter (use cultivator attachment)				
Mower	1	5'	100	100
Dump rake	1	10'	55	60
Derrick, and Jackson fork	1		75	75
Bob-sled	1		50	50
Wagon (farm truck)	1		75	75
Wagon bed (homemade)	1		10	10
Hay rack	1		40	40
Manure spreader	1		190	190
Cream separator	1		105	109
Small tools			50	50
Harness	2 sets		155	160
Total			\$2,347	\$2,432
Work animals, 4 @ \$65 each			\$260	

Note: Not all this machinery is needed unless hay, grain, beets, and potatoes are all grown on the farm.

APPENDIX II—GENERAL FARMING SYSTEMS

TABLE XXII

Feed Requirements per Unit of Dairy Cattle, Sheep and Hogs.

Kind of Feed	Unit	Amount of Feed per Livestock Unit ¹		
		For one 1000 pound Cow giv- ing 300 pounds butterfat per year	For one Ewe with an aver- age of 1.2 lambs per year	For each 100 pounds of liveweight Hog produced ²
Pasture:				
Grass mixture	acres	.5	.11	....
Alfalfa	acres	....	....	.017
Alfalfa hay	tons	3.0	.28½	.019
Wheat	cwt.	....	....	3.340
Barley	cwt.	4.0	.64	....
Oats	cwt.	....	....	.410
Bran	cwt.	....	....	....
Wheat or barley	cwt.	....	....	....
Oats or bran	cwt.	4.0	....	....
Pea meal	cwt.	4.0	....	....
Tankage	cwt.	....	....	.260
Potatoes	cwt.	27.0	2.10	1.200
Salt and minerals	lbs.	50.0	5.00	3.400
Beet pulp	tons	1.7	....	....

¹ These estimates of feed requirements have been made with the assistance of the Department of Dairy Husbandry and the Department of Animal Husbandry, University of Idaho.

² These are the average feed requirements per one hundred pounds of live pork produced when brood sows are kept and pigs farrowed and fed as indicated in budgets used in Table X.

TABLE XXIII

Normal Production, Equipment and Miscellaneous Requirements per
Unit of Dairy Cattle, Sheep and Hogs.
Idaho Falls Area, 1925-30.

Item	Dairy Cattle		Sheep		Hogs	
	Unit	Per year	Unit	Per year	Unit	Per year
Production:						
Butterfat	cow	300 lbs.				
Cull cows	herd	21.4 %				
Requirements for 14-cow dairy herd:						
Taxes	head	\$ 1.50				
Veterinarian and medicine	head	2.50				
Bull depreciation	head	50.00				
Dairy equipment—depr. and repairs	value	13 % of value new				
Dairy shelter; depr., repairs and insurance	herd	\$31.00				
Fence for 80 acres	herd	29.00				
Production:						
Lambs			ewe	1.2 lambs		
Wool			ewe	10 lbs.		
Cull ewes for sale			flock	10 %		
Requirements for flock 124 ewes:						
Taxes			head	\$.24		
Veterinarian and medicine			flock	24.00		
Ram depreciation			head	6.65		
Sheep shelter; depr., repairs and insurance			flock	42.40		
Fences for 80 acres			flock	30.00		
Production:						
Pigs					litter	6 pigs
Litter					sow	3 litters
Requirements for 3-sow hog unit:						
Veterinarian and medicine					herd	\$12.39
Incidentals and taxes					herd	7.42
Boar service					litter	2.00
Death risk					herd	5.02
Hog equipment and fences; depreciation and repairs					herd	18.20

TABLE XXIV

Estimated Average Weighted Prices Received by Farmers for Livestock and Livestock Products in the Idaho Falls Area by Years, 1925-31.

Year	Butterfat ¹		Cull ² dairy cows	Sheep ³			Wool ⁴	Eggs ⁵	Poultry ⁶		Hogs ⁷				
	In	In		Lambs	Cull	Cull			Light	Frys	Light butchers		Packer sows		Stags
	cream	whole milk			Sept.	Oct.			hens		Sept. price	March price	March price	June price	docked 70 lbs. July price
	lb.	lb.	Head	Head	Head	Head	lb.	doz.	Each	Each	cwt.	cwt.	cwt.	cwt.	cwt.
1925	\$.46	\$.52	\$33.00	\$ 9.75	\$ 7.58	\$ 7.50	\$.39	\$.26	\$.45	\$.37	\$11.65	12.14	\$10.68	\$ 9.69	\$10.49
1926	.41	.47	38.00	9.20	6.09	5.60	.33	.22	.52	.44	12.87	12.22	9.22	10.18	.....
1927	.42	.48	41.00	9.14	5.20	4.07	.30	.20	.47	.39	10.34	10.63	8.51	6.38	6.10
1928	.43	.50	54.00	10.06	6.20	3.98	.34	.23	.59	.49	10.66	7.20	5.50	6.28	6.72
1929	.42	.48	59.00	8.80	4.15	4.07	.31	.27	.58	.52	9.30	10.08	6.98	7.29	7.47
1930	.33	.38	44.00	5.22	1.44	1.20	.21	.20	.36	.32	9.54	9.25	6.96	6.64	6.12
1931	.24	.28	20.00	4.05	.69	.69	.14	.17	.34	.39	4.97	6.48	4.64	3.50	3.53

¹ Prices furnished by creameries and dairy manufacturing plants in Idaho Falls area.

² Estimates by local dealers in cows checked with other available market reports.

³ Prices of sheep furnished by E. F. Rinehart, Extension Animal Husbandman, University of Idaho.

⁴ Estimated average farm price of wool for Idaho for the 15th of each month averaged for the year. Taken from crops and markets of the U. S. D. A.

⁵ Prices furnished by the Idaho Egg Producers Association, Caldwell, Idaho.

⁶ Prices furnished by Swift and company, packers at Twin Falls, Idaho.

⁷ These prices of hogs are the prices prevailing on the Ogden market less \$1.00 per hundredweight to take care of freight and handling charges. Prices at Ogden supplied by U. S. D. A.

