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Economic Adjustments on Farms in Southeastern South Dakota

R.H. Rogers

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ECONOMIC ADJUSTMENTS ON
FARMS IN SOUTHEASTERN
SOUTH DAKOTA



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Cooperating with the
Bureau of Agricultural Economics
United States Department of Agriculture

Farms located in Lincoln, Clay and Union counties near Beresford, South Dakota, were studied in detail during 1928. The results of the study furnished the basis for this bulletin. Farms representative of size, practices, tenure and present farming systems were selected so that the data obtained would be of greatest value. Receipts and expenditures, labor, feed and other requirements common on the farms studied have been used in outlining the suggested systems and in making up the budgets included.

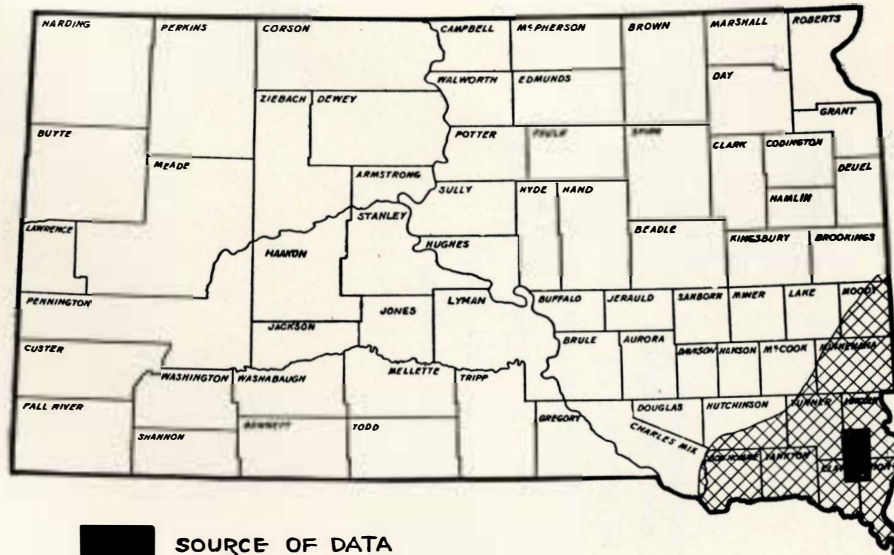
Increased returns are possible on many farms in the southeastern part of the state. The establishment of systematic crop rotations, fertility and soil maintenance, additional livestock to utilize the roughage and feed grains produced, careful practices and livestock sanitation combined with production that meets the demands of the consumer are all factors that must be considered to insure satisfactory returns. Six systems are included in this bulletin which may serve as a guide when economic adjustments on farms are being planned. Such adjustments must be worked out by the individual operator who is familiar with all the essential factors.

In reorganizing a farm business or even when determining upon minor changes to be made, farmers will find it to their advantage to follow the lead of other successful business men in preparing budgets, or plans, to serve as an intelligent guide. A method is presented in this bulletin whereby farmers in South Dakota, especially in the southeastern part, may set up budgets based upon their local situation, and upon the current price prospect. Forms for doing this are included in the appendix.

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SOUTH DAKOTA



SOURCE OF DATA



AREA WHERE MOST APPLICABLE

Economic Adjustments on Farms in Southeastern South Dakota

R. H. Rogers*

This bulletin is based on a year's study of 16 farms in southeastern South Dakota, and is intended as a guide for farmers in that region who may wish to make adjustments in their present farming systems; for young men who plan to farm in that section of the state, and for educators and students of farm management. The study was made to determine systems of farming likely to give good results over a period of years in the area studied. Enterprise combinations which appear advantageous, practices giving good results in the principal enterprises and adjustments between and within enterprises likely to be desirable with changing conditions are presented in this publication.

The 16 farms studied were located in the area in Figure 1. During the year 1928 data showing the man labor, horse work and materials used in growing crops; and man labor, horse work, feed and materials used in producing livestock and livestock products were obtained; also a record of all financial transactions. The route method of obtaining data was used; that is, the farms were visited at regular intervals, and the farmers were assisted in keeping careful and complete records of all farm operations.

Nearly 50 per cent of the farms in this area are quarter section farms, and about 85 per cent of all the farms are approximately 160, 240, 320 or 480 acres in size. The selection of the cooperator farms was influenced by this grouping, and eight of the farms, or 50 per cent, were of the quarter section size. Of the remaining farms studied, two were 240's, four were 320's and two were 480's. Six of the 16 farms included in the survey were operated by owners, four were managed by tenants and six were operated by farmers who owned part and rented part of the land they farmed. Farms that were unusual as to investment, kind or size of machinery, nature of the business, or other features that would render them non-typical, were not included in the study.

The area to which this bulletin is most applicable is characterized by a greater average rainfall and a longer growing season than is found in any other part of the state. The average total precipitation over a number of years has been more than 25 inches, and the average number of frost free days in this area exceeds 140, permitting the growing of corn varieties that are larger than those advisable in other sections. A deep fertile soil, combined with the above mentioned natural factors, make this area an important part of the nation's corn belt. More detailed information concerning production factors in this region may be obtained in S. D. Bulletin 238, "Types of Farming in South Dakota."

*Acknowledgment is due the farmers near Beresford who cooperated in supplying the data upon which this study is based; to Mr. Poul Christophersen, the field man during the study, who also assisted materially in tabulating and interpreting the data; and to colleagues in the Agricultural Economics Department for valuable suggestions and criticisms in the preparation of this bulletin.

Table I

STATEMENT OF RECEIPTS, EXPENSES AND EARNINGS OF FARMS STUDIED

Farm Number	Average Investment	Cash receipts	Value of farm products used	Change In inventory	Total credits	Cash expenses	Value of unpaid labor	Total charges	Farm income*	Operator's labor and management-wage†	Rate earned on investment‡	Size of farm
1.....	\$ 103,825	\$ 21,471	\$ 739	\$ 12,314	\$ 34,524	\$ 23,566	\$ 1,258	\$ 24,824	\$ 9,700	\$ 4,509	% 8.4	Acres 480
14.....	89,820	23,389	275	8,781	32,445	21,090	1,333	22,423	10,022	5,530	10.0	480
16.....	70,300	16,580	456	12,934	29,970	20,538	1,867	22,405	7,565	4,050	9.7	410
6.....	81,373	13,209	582	9,576	23,367	15,155	387	15,542	7,825	3,757	8.4	360
12.....	61,260	10,518	416	6,668	17,602	12,461	647	13,108	4,494	1,431	5.9	350
2.....	58,730	7,550	346	1,231	9,127	3,405	566	3,971	5,156	2,220	7.1	320
13.....	45,920	7,238	357	5,324	12,919	9,231	449	9,680	3,239	944	4.8	240
5.....	43,240	5,993	316	5,276	11,585	5,467	1,212	6,679	4,906	2,744	9.3	231
8.....	36,700	15,016	234	3,008	18,258	13,121	244	13,365	4,893	3,059	10.6	160
10.....	36,900	13,037	584	-618	13,003	10,293	312	10,605	2,398	553	4.0	160
18.....	31,190	5,136	356	6,183	11,675	8,850	597	9,447	2,228	668	4.0	155
15.....	36,870	5,364	288	748	6,400	1,821	829	2,650	3,750	1,906	7.4	156
9.....	37,150	5,652	184	-789	5,047	3,083	387	3,470	1,577	-281	1.5	160
11.....	31,320	4,569	312	832	5,713	1,521	816	2,337	3,376	1,810	7.5	160
3.....	33,670	4,413	197	1,053	5,663	1,883	1,245	3,128	2,535	851	4.6	160
7.....	22,670	2,352	371	-215	2,508	1,242	188	1,430	1,078	-56	.3	158
Weighted Average..	51,310	10,093	376	4,492	14,961	9,545	771	10,316	4,645	2,079	7.1**	260

*Farm income is found by subtracting total charges from total credits.

†Operator's labor and management wage is found by deducting a charge for interest on the average investment from the farm income.

‡Rate earned on investment is found by subtracting an allowance for the operator's labor from the farm income; then dividing the difference by the average investment and multiplying by 100.

**The straight arithmetical average of the rate earned is 6.4 per cent.

This study is the third of a series which has been completed by the Department of Agricultural Economics of South Dakota State College in cooperation with the United States Department of Agriculture. The first of these studies was made in Kingsbury County and the results were reported in Bulletin 226, "Profitable Farming Systems for East-Central South Dakota." The second study was made in Brown County, and some of the results are presented in Bulletin 235, "Profitable Farming Systems for the Intensive Spring Wheat Area in South Dakota." This third study includes parts of Lincoln, Clay and Union counties, near Beresford, in the intensive livestock feeding area described in Bulletin 238, "Types of Farming in South Dakota." A fourth study is now in progress in the north central part of the state.

Enterprise Distribution and Financial Returns of Farms Studied

In Table I is shown a condensed statement of the credits and charges of each farm; the farm income, operator's labor and management wage and the rate earned on the investment.

No personal or household items are included at any place in this bulletin; therefore, the farm dwelling being considered as personal, is not included in the inventory, nor are any charges for upkeep, insurance or taxes on the dwelling included in any calculations.

The average investment varied largely according to acreage, but there were some wide differences. There was a difference of \$14,000 investment in the two 480's, more than \$20,000 between the 350 and 360, and a range of \$13,000 in the 160-acre class of farms.

Generally speaking, both the total credits and the total charges were highest for the largest farms, and less for each smaller size of farm, but the total credits decreased more rapidly than the charges, leaving correspondingly lower incomes for the smaller farms. Both the income per acre and per dollar invested were highest for the larger farms. Among the 160-acre farms, the farm income ranged from \$1,078 to \$4,893, the operator's labor and management wage from -\$281 to \$3,059, and the interest on investment from 0.3 per cent to 10.6 per cent. The farm with the least income had only 23 productive animal units, grew fewer acres of corn than any other farm, had only seven acres of alfalfa, and for pasture depended almost entirely on native grasses. Most of the farms on which beef cattle feeding was an important enterprise made higher returns than would usually be expected, due largely to the unusual prices for beef in 1928. On the other hand, the pork market was lower than normal, especially in the spring when most of the pork was sold. If comparisons are made between these actual returns and those shown later in the suggested systems, it should be remembered that the latter are based upon a more normal price relationship.

The number of productive livestock units and the number of productive crop acres on each farm studied are shown in Table II,

Table II
MEASURES OF SIZE OF BUSINESS ON FARMS STUDIED

Farm Number	Acres in farm	Productive Livestock					Productive Crop Acreage						Percentage of Total Investment				
		Milk cows	Other cattle	Hogs	Poul- try	Total	Corn	Small grain	Alfal- fa hay	Other hay	Seed- ed pas- ture	Na- tive pas- ture	Total	In live- stock	In crop acre- age	In live- stock and crop acre- age	
		A.U.	A.U.	A.U.	A.U.	A.U.	A.	A.	A.	A.	A.	A.	A.	%	%	%	
1.....	480	11.5	117.1	36.7	6.0	171.3	208.5	147.1	17.0		82.0	6.3	460.9	24	59	83	
14.....	480	5.2	70.8	22.1	2.8	100.9	303.3	98.5		3.3	17.9	38.9	461.9	22	60	82	
16.....	410	10.7	42.1	26.3	3.8	82.9	206.3	122.6	12.9	5.6	9.6	32.8	389.8	21	64	85	
6.....	360	6.4	59.9	12.9	2.0	81.2	162.2	95.2	21.0	7.1	44.0	13.8	343.3	21	59	80	
12.....	350	5.8	29.3	19.1	3.8	58.0	172.1	71.4	29.8	25.1	15.8	4.0	318.2	18	64	82	
2.....	320	5.0	13.8	13.0	2.5	34.3	137.0	101.4	27.4		21.5	12.8	300.1	14	65	79	
13.....	240	7.0	27.3	13.5	2.0	49.8	102.7	73.4	6.8		38.0	220.9	21	58	79		
5.....	231	6.0	9.5	17.6	2.4	35.5	141.0	53.0	7.4	4.5	12.9	2.5	221.3	17	65	82	
8.....	160	4.0	39.1	7.3	2.2	52.6	89.3	42.7	3.7		12.0		147.7	26	54	80	
10.....	160	13.7	21.6	6.6	2.4	*48.4	72.3	24.1	34.3		1.5	19.4	151.6	18	52	70	
18.....	155	9.5	11.6	15.6	3.6	†45.2	61.0	30.8	27.2		5.2	18.1	142.7	25	52	77	
15.....	156	10.5	2.0	18.7	5.5	36.7	61.7	36.1	14.8	10.9	3.2		15.2	141.9	16	53	69
9.....	160	5.3	3.9	19.3	2.4	30.9	74.8	53.5				17.0	145.3	16	48	64	
11.....	160	8.0	5.1	12.2	2.6	27.9	78.4	34.1	12.1	1.1	26.6		152.3	16	63	79	
3.....	160	11.2	6.3	6.7	5.0	29.2	102.4	23.0			15.6		151.2	17	57	74	
7.....	158	3.0	10.6	7.3	2.5	23.4	53.1	33.6	6.7	13.8	1.9		24.1	133.2	14	59	73
Average.....		7.7	29.4	15.9	3.2	‡56.8	126.6	65.0	13.8	4.5	16.9	15.8	242.6	20	59	79	

*Includes 4.1 A.U. for sheep.

†Includes 4.9 A.U. for sheep.

‡Includes .6 A.U. for sheep.

arranged according to the productiveness of the enterprise. A wide range of acres of each kind of crop, and of the numbers of each kind of livestock is evident on farms of the same number of acres. Some outstanding differences on the farms of approximately 160 acres are: a range of from 23 to 52 animal units (A.U)* a range of from 53 to 102 acres of corn, 23 to 53 acres of small grain, 0 to 34 acres of alfalfa, and 0 to 26 acres of seeded pasture.

In Table II is also listed for each farm the percentage of the total investment which was in productive livestock and in productive crop acreage. The sum of these two items averages 79 per cent for all farms. This leaves an average of 21 per cent of the investment in buildings, machinery, power, feed, etc. Such items constitute an overhead item of expense, the cost of which must be borne by the productive enterprises. It is, of course, good business to keep such items at a minimum in order to reduce production costs. On farm number 9, it will be noticed that this overhead amounted to 36 per cent of the total investment. On this quarter section farm, all costs were extraordinarily high, reflecting the overcapitalization in good buildings. It is desirable to have adequate shelter and equipment, but from a strictly business point of view, it can be carried to an extreme. On larger farms, or where extra high yields are obtained, such high building investments might be absorbed.

In Table III is shown the total income from each farm, and the percentage that each source of income is of the total. The total credits are largely in proportion to the size of the farm, although there is a great variance in the credits of the farms of approximately 160 acres; the range for farms of that size being from \$2,110 to \$8,104. In general, the farms with the highest percentages of total income coming from beef and pork had the greatest total credits.

The total charges both cash and non-cash against each farm, and the per cent each charge is of the total is shown in Table IV. The total charges run in almost direct proportion to the number of acres in the larger farms, while the charges against the farms of approximately 160 acres ranged from \$3,186 to \$6,065. The average of all cash charges was 29.8 per cent, while the total of the non-cash items, interest on investment, operator's labor, depreciation, family labor and board and room for hired labor, averaged 70.2 per cent of the total charges.

Important Production Factors

The following discussion of the important production factors is given to summarize the practices prevailing on the farms studied and to explain some of the items included in the suggested farming systems:

Power: The cost per hour for power, either horse, tractor, truck or combinations of these, depended with few exceptions upon the total number of hours such power was used during the year.

*An animal unit is a measure used in comparing the livestock handled on different farms. Such a unit is equivalent to one mature horse or cow, 1,000 pounds of beef, pork or mutton, or 50 hens, that are on hand throughout the year.

Table III
PERCENTAGE DISTRIBUTION OF CREDITS ON FARMS STUDIED

Farm Number	Rate earned on investment	Total Net† Credits	Beef*	Pork	Mutton	But-terfat	Eggs and Poultry	Feed Crops	Cash‡ Crops	Misc.	Total	Portion of total Credits	
												Cash	Total
	%	\$	%	%	%	%	%	%	%	%	%	%	%
1.....	8.4	15,718	76.1	26.3		6.7	39.	-23.6		.6	100	24.7	77.7
14.	10.0	15,883	70.8	22.0		3.8	4.0	-.6			100	22.7	71.6
16.....	9.7	13,095	47.4	24.5		10.6	2.5	7.6	3.2	4.2	100	24.0	76.5
6.....	8.4	12,236	59.7	17.0		5.9	2.2	15.2			100	23.9	77.6
12.....	5.9	8,843	35.9	33.6		7.2	5.1	16.9		1.3	100	31.2	94.0
2.....	7.1	8,319	22.3	31.3		6.0	3.6	31.1	5.7		100	23.1	85.2
13.....	4.8	6,256	32.0	37.9		13.4	6.8	9.9			100	32.5	101.3
5.....	9.3	7,975	14.9	42.2		7.1	4.4	30.0	1.3	.1	100	17.2	76.8
8.....	10.6	8,104	90.2	18.2		5.4	4.2	-19.5		1.5	100	33.4	75.0
10.....	4.0	5,271	55.8	9.7	9.0	32.0	5.2	-14.3		2.6	100	42.2	107.2
18.....	4.0	5,024	21.4	62.1	22.6	15.3	13.9	-35.5		.2	100	35.2	106.4
15.....	7.4	6,298	4.1	61.4		17.1	14.6	2.0		.8	100	17.2	86.1
9.....	1.5	4,210	8.9	82.1		13.3	11.7	-16.0			100	39.0	134.0
11.....	7.5	5,439	20.5	50.9		16.9	7.3	4.4			100	15.8	85.6
3.....	4.6	5,187	12.6	20.6		16.3	12.8	34.7		3.0	100	18.5	102.9
7.....	.3	2,110	21.2	70.1		10.6	16.9	-20.7		1.9	100	27.0	151.1
Weighted Average.	7.1	8,124	45.7	33.3	1.2	9.9	5.8	2.3	.8	1.0	100	25.8	86.3

*For beef, pork, mutton and feed crops, the items cover the net amount, that is, sales minus purchases.

†Includes wheat, flax and rye.

‡Total net credits was found by subtracting the sum of the costs of livestock and feeds purchased from the sum of cash sales, value of products used in the home, and increase in value of livestock and feed supplies.

Table IV
PERCENTAGE DISTRIBUTION OF CHARGES ON FARMS STUDIED

Farm Number	Total Net Charges†	Purchasing and Marketing	Veterinary and Medicine	Commercial Feeds	Crop Costs*	Repairs	Fuel and Lubricants	Taxes and Insurance	Hired Labor	Total Cash Charges	Depreciation	Unpaid Family Labor	Board. Room for Hired Labor	Value Operator's Labor	5% Interest on Average Investment	Total
	\$	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
1	12,239	6.4	2.0	1.0	2.8	1.6	3.1	4.3	10.5	31.7	7.3	5.7	4.6	2.3	42.4	100
14	11,373	9.1	1.3	1.6	4.0	2.8	1.0	5.6	6.3	31.7	3.3	5.7	3.2	2.0	39.4	100
16	10,065	8.0	1.4	1.5	2.2	2.4	2.4	7.7	5.6	31.2	5.1	17.6	1.0	10.2	34.9	100
6	9,499	6.0	.7	.9	3.0	1.6	1.3	5.1	12.1	30.7	11.6	2.9	4.1	10.7	42.9	100
12	8,305	4.8	.7	1.4	2.1	3.3	3.3	5.6	11.5	33.2	11.4	2.9	4.9	10.7	36.9	100
2	7,077	1.7	.4	.6	3.3	2.7	1.0	4.9	12.5	27.1	9.6	3.4	4.6	13.8	41.5	100
13	6,332	4.6	3.1	2.3	3.7	3.0	3.5	4.5	7.4	32.1	8.5	2.9	4.2	16.1	36.2	100
5	6,124	3.8	1.6	1.0	1.6	3.6	2.6	7.5	1.8	22.3	8.0	19.2	2.6	14.6	35.3	100
8	6,065	16.0	1.9	7.3	3.6	3.8	1.5	2.9	7.6	44.6	4.4	1.6	2.5	16.8	30.1	100
10	5,653	14.4	1.5	1.5	4.1	2.7	1.1	4.4	9.7	39.4	5.9	.6	5.0	16.7	32.4	100
18	5,334	6.8	1.7	1.0	1.9	3.8	1.1	7.1	9.6	33.0	8.2	6.7	4.5	18.4	29.2	100
15	5,412	3.0	1.3	3.4	2.4	2.7	1.9	4.3	1.0	20.0	11.8	15.3		18.8	34.1	100
9	5,511	2.0	.8	4.2	3.5	4.0	2.8	2.8	9.6	29.7	11.0	3.3	3.8	18.5	33.7	100
11	4,649	3.6	1.1	1.9	3.2	3.7	.7	4.1	.2	18.5	8.4	17.5		21.9	33.7	100
3	5,314	.4	1.7	2.5	2.6	3.3	1.9	5.2	.4	18.0	8.5	23.4		18.4	31.7	100
7	3,186	3.6	1.2	2.0	2.2	1.0	.7	6.6	.6	17.9	8.6	5.7	.1	32.0	35.7	100
Weighted Average	7,009	6.2	1.4	2.0	2.9	2.7	2.0	5.2	7.4	29.8	8.5	8.1	2.9	14.1	36.6	100

*Crop cost includes twine, threshing, seed, grinding, shelling, etc.
†Total net charges include cost of buying and selling livestock, seeds, twine, threshing, repairs on machinery, fuel taxes, all labor, interest on investment and any depreciation on livestock or supplies.

The proportion of crop acreage to the available power on the farm determined to a great extent the amount of time each unit could be employed.

Although there were 11 tractors on the 16 farms studied, the bulk of the draw-bar power was supplied by horses. The work performed by each horse ranged from 527 to 1,089 hours; the average was 783 hours. The cost per hour for the above work was 18 and 9 cents respectively, with the average for all farms being 10.7 cents. The net cost per horse averaged \$84, ranging from \$61.50 to \$99. On farms where horse costs were kept at a low figure, much of the necessary roughage was supplied in the form of oat straw, stubble and corn stalk pasture.

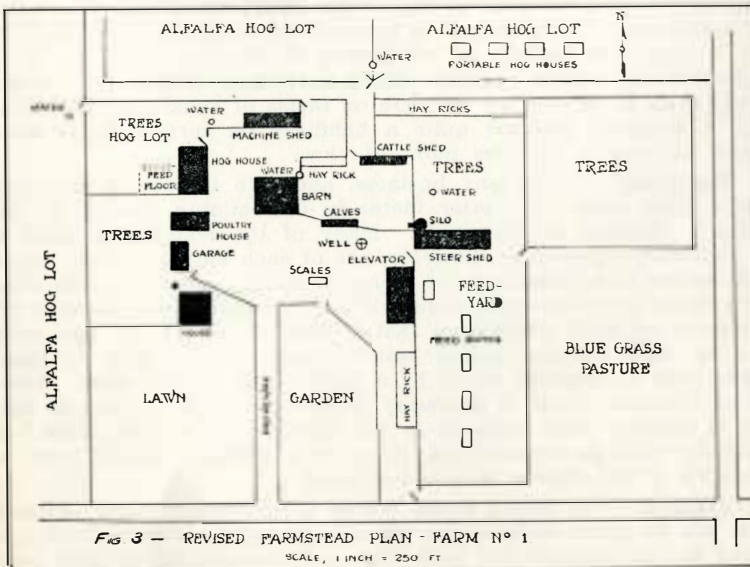
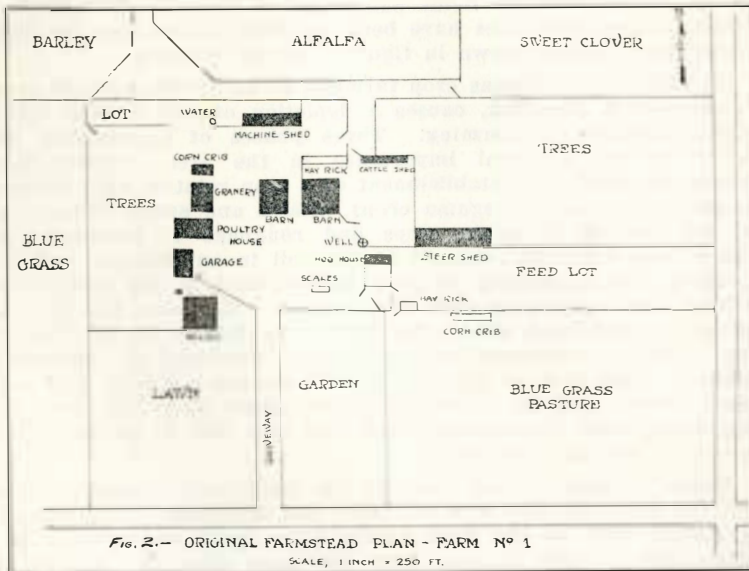
Total tractor costs varied from \$78 to \$407, averaging \$240.50. The hours of tractor work varied from 52 to 451 on the above farms, respectively, with an average on all farms of 236 hours. The average cost per hour was \$1.01 for tractor work as compared to 10.7 cents for horse work. Figuring on a tractor replacement of five horses and the saving in man labor due to about one-third greater speed with a tractor, there is nothing in this study to prove which form of power is more economical. In either case the available power must be used a large number of hours if low cost power is to be obtained. This situation calls for a farming system that provides considerable draw-bar work and, most important of all, it calls for a proper adjustment of available power to the power requirements of the particular farm.

There were five farms having trucks—some old, some new. For economical transportation, this study indicates that hired trucking for these particular farms is advisable. In an area not so well supplied with good trucking service, such may not be the case, however, the convenience of having a truck on the farm may often offset the high cost of a farm owned truck.

Equipment: This study has indicated the advisability of using custom rigs whenever possible, such as grain separators, feed grinders, shellers and trucks, because the rates commonly charged are considerably below the annual cost of owning such equipment. If satisfactory arrangements are possible, a saving can often be made by owning in partnership such equipment as ensiling machinery, corn binders, etc. The farmers who own a side delivery rake think it a decided advantage in putting up a good quality legume hay.

Farmstead: The word farmstead includes the lawn, barnyard, garden, groves and the small feed lots usually found adjacent to the barnlots. Nearly every farmstead offers the opportunity of making some change to simplify chore work by more convenient arrangement of buildings and lots. Before new buildings are put up or new lots fenced in, convenient arrangements for saving time and labor should be considered. The more important items for consideration include convenience for hauling loads in and out, short walking distances, an adequate and handy supply of good water for both the household and livestock, good drainage that will provide dry feed lots and barnlots, concrete feeding floors for hogs, permanent hay bunks (which may also give protection from wind and snow), and shelter belts.

Farmstead arrangements are different on every farm, and only one example of an original plan and a rearranged plan is given. Figure 2 was the actual layout of farm No. 1 and figure 3 is designated to be a satisfactory rearrangement.



Field Layout: In establishing a systematic crop rotation system it is desirable to have fields that are uniform in size. The number of fields in the major rotation will depend upon the length of the rotation that is adopted. For the greatest saving in fencing and crop labor fields should be oblong in shape, and the arrangement so planned that all fields will corner as near the farmstead as possible. These principles have been included in planning the reorganized farm layouts shown in figures 4 to 9, inclusive.

Fertility: Continuous crop farming, or an overbalance of crops as compared to livestock, causes a depletion of soil fertility under ordinary methods of farming. Three phases of maintaining soil fertility are of practical importance in the area. These three methods are, first, the establishment of a crop rotation that includes a considerable area in legume crops, alfalfa and sweet clover; second, the feeding of grain crops and roughage to livestock, the manure from which is returned to the soil in an efficient manner; and third, the application of phosphorus which is the commercial fertilizer most needed on soils in this area. If such a soil fertility program is established before the natural fertility is too greatly run down, it will be necessary only to supply a minimum of commercial fertilizer. Even this, at the rate of 200 pounds per acre, and with present prices, calls for a cash outlay of about \$2.50 per acre, but is far better than the eventual cash cost that will be necessary unless such a system is followed.

Taxes: About 18 per cent of the total cash expenditures on all of the farms studied was for taxes and insurance. This amount was second only to the cash expenditures for hired labor. The greater part of such charges were for taxes since the amount of insurance carried on most of the farms amounted to but very little. The irregularity in tax charges is more striking than the total amount, and is explained largely by variations in the tax levies for local improvements, chiefly schools. Such variations caused tax charges of less than \$1 to over \$2 per acre on farms of equal productiveness. Such a situation imposes quite a handicap on certain farms when looked at from a business point of view.

Financing: As in any business, adequate finance is important and is quite often the major factor in determining whether or not desirable changes can be made. Many of the features included in the following suggestions, however, are of such nature that an immediate outlay of a large sum of money is unnecessary. On the other hand, many of these suggestions will pay for themselves through the saving or increased production that is likely to result. In any event most of such changes should best be made over a term of years, rather than be brought about by a radical and sudden shift. Then, too, if a farmer finds it necessary to secure outside capital to help him in making some changes in his business, it is likely that less difficulty will be encountered if a well planned budget can be presented at the time a loan is requested.

Tenancy: On rented farms where a satisfactory lease arrangement can be made between the owner and renter, the methods presented in this bulletin for budgeting and reorganizing a farm busi-

ness should be as important as to an owner-operator. The relationship between the two parties concerned and the permanency of the partnership must determine whether or not any use can be made of the following suggested farming systems. In passing, it might be

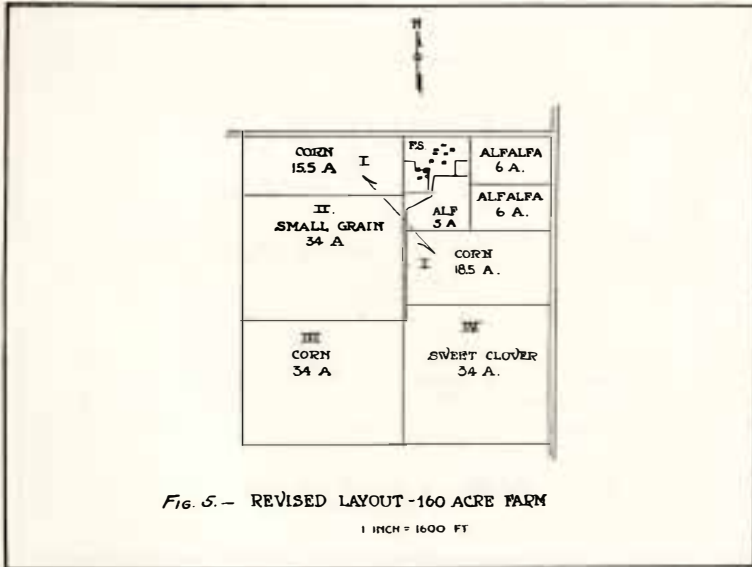


Fig. 5. - REVISED LAYOUT - 160 ACRE FARM

1 INCH = 1600 FT

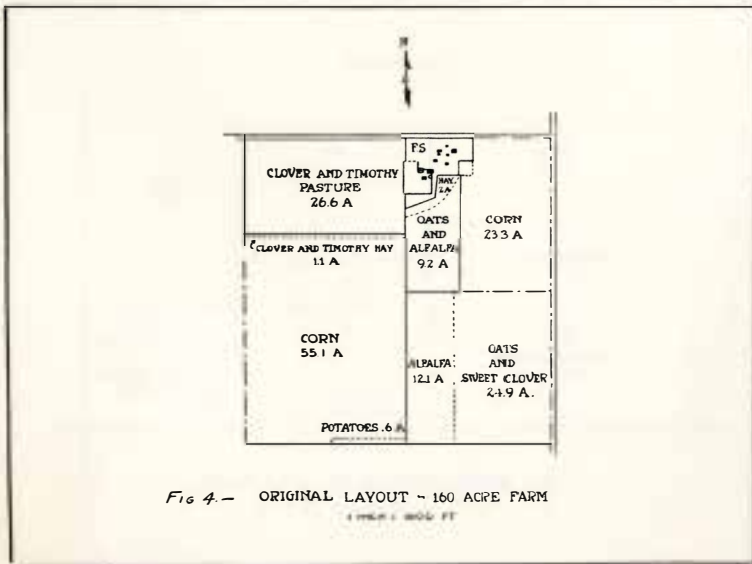
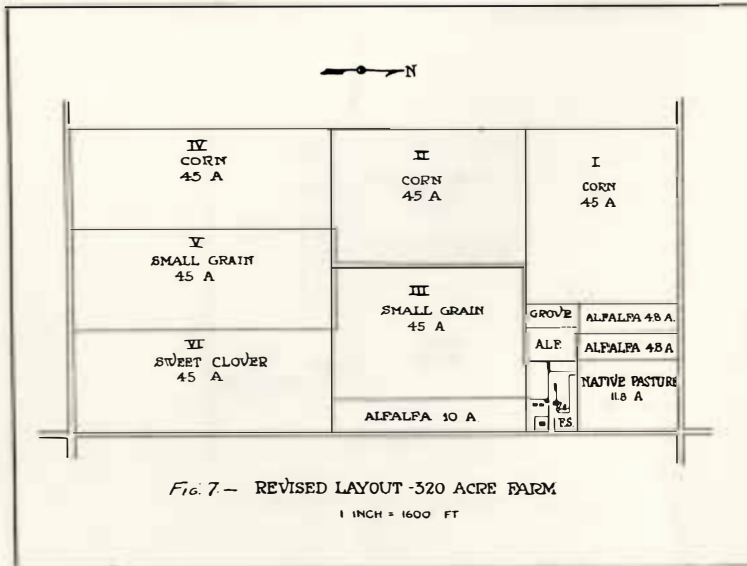
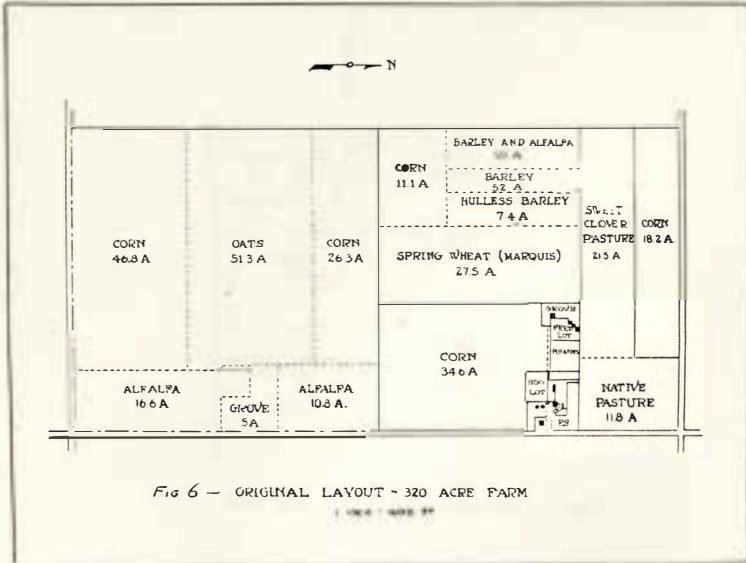


Fig. 4. - ORIGINAL LAYOUT - 160 ACRE FARM

1 INCH = 800 FT

well to point out that efficient and economical production based upon a good farming system must be obtained on tenant farms if a satisfactory return is to be expected when such farms are competing with owner-operated farms run under similar production and marketing conditions.



Standards Used in the Systems Suggested

At the outset of this discussion of suggested farming systems it must be realized that no two farms are organized exactly alike and that these suggestions are to be used only as a guide. Any farmer using them as such will have to apply the specific data from his own business to arrive at the probable returns from any reorganization.

In the discussion that follows, a uniformity in assumed property values has been maintained insofar as possible in order to show that the variations in returns have been caused by the differences in the farming systems. Prices and yields have likewise been kept constant in these comparisons for the same reason. (See Appendix).

Investments and Upkeep: The value for land only (not including buildings or fences) has been placed at \$125 per acre for tillable land and at \$90 per acre for rough land.

Seventy-five cents per rod has been used for fence; it being assumed that new and well constructed woven wire fence would cost around \$1.25 per rod. No barbed wire fence has been considered in view of the fact that all of the suggested systems are based largely upon livestock. A 10 per cent charge on the inventory value has been made for fencing in all cases, for replacement and upkeep.

The inventory values for buildings and equipment have been based throughout on an average investment and the annual charges doubled over the usual rates for new equipment.

A house for the operator's family has not been included as a part of the farm business, as this is considered personal property. Any lighting equipment would also be considered as a personal item.

Each farm has been charged with the inventory value of \$300 for a water system. An annual charge of \$30 has been made to cover all costs except interest.

On the farms studied, it was common to find a barn that was inventoried at \$1500 that provided space for 20 head of horses or cows. This amounts to an investment of \$75 per head. This relationship was quite uniform on the actual farms and has been used in the suggested systems. An annual charge of 5 per cent of the inventory values has been made to cover depreciation and repairs.

For the storage of grain of all kinds, an inventory value of \$20 per 100 bushels has been used with an annual charge of 6 per cent to cover depreciation and upkeep.

Based upon the machinery investment on typical farms that were studied, the following charges per crop acre have been made in budgeting the suggested farming systems:

Acres Per Farm	Machinery Investment Per Crop-Acre
160	\$7.00
240	6.50
320	6.00
480	5.50

A charge of 20 per cent of the total inventory value of the machinery has been made to cover depreciation and cash repairs for

the year. Each farm has been listed with an inventory value of \$300 for machinery shelter on which a 6 per cent annual charge has been made.

Each of the suggested systems includes an inventory value of \$250 as the farm's share of an automobile. An annual charge against the farm business has been made amounting from \$150 to \$200 for depreciation and running expenses.

Horses on all these farms have been valued at \$100 with an additional \$30 for the necessary equipment. An annual charge of \$10 per horse has been made to cover replacement and cash upkeep of harness, etc. Most of the systems have been based upon horses for power in order to keep them comparable. For the 160-acre farms, five horses have been deemed necessary; on the 240's, seven horses; on the 320's, eight horses, and on the 480-acre farms, eight horses and a 10-20 tractor.

The inventory values for cows have been placed on a sliding scale comparable to the customary values and according to production. An additional charge of \$10 per head has been made to take care of the investment in equipment and \$1 per head has been charged for upkeep. On this basis the following values have been used.

Annual Butterfat Production Pounds	Inventory Value Dollars
175	70
200	80
225	90
250	100
275	110
300	120
325	130

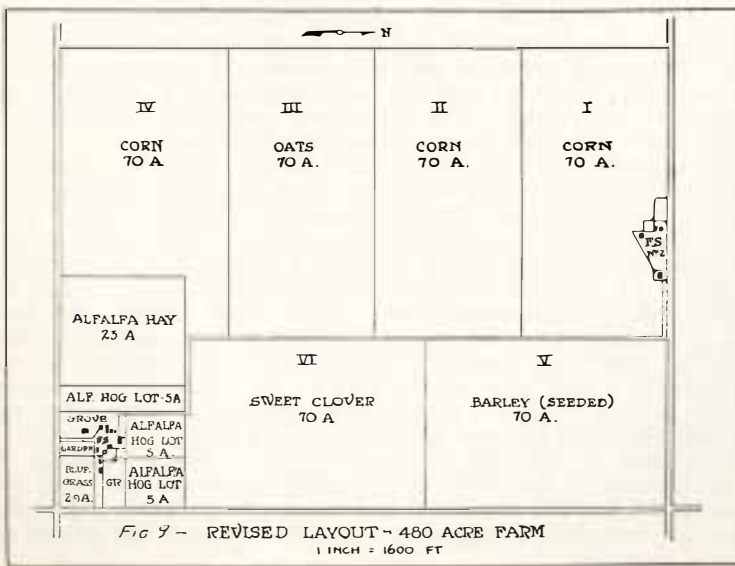
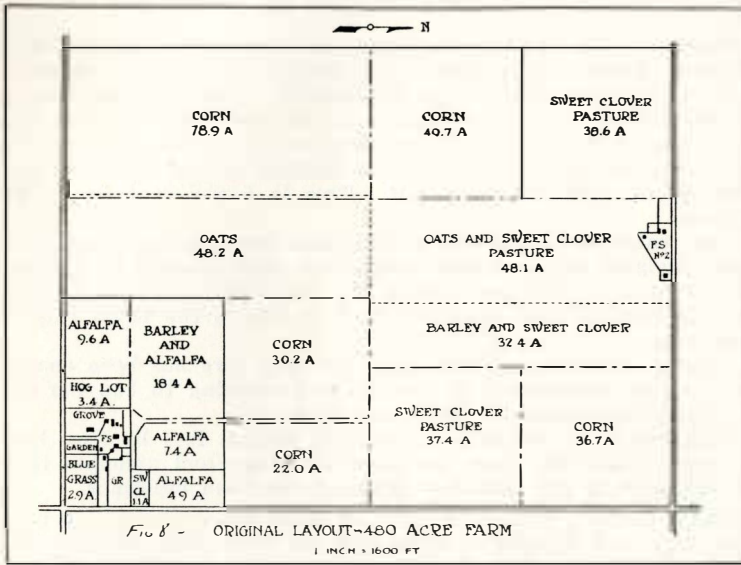
When steer feeding has been included as a part of the business, an inventory value for shelter and equipment amounting to \$5 per head with an annual charge of 20 per cent for depreciation and upkeep has been made.

Although a flat charge per sow for shelter is incorrect, in that a large enterprise should provide cheaper shelter per sow than a small one, such a method has been used in the following budgets in order to simplify the calculations. In cases where only spring litters have been used, a charge for shelter and equipment amounting to \$5.25 per sow has been made. When spring and fall litters have been used (in the ratio of 2 to 1) a charge of \$3.50 per sow-litter has been made. In the inventory, the hog shelter and equipment have been figured at \$45 per sow when only spring litters are handled, or \$30 per sow-litter when spring and fall pigs in the ratio of 2 to 1 are handled.

An inventory figure of \$400 for poultry shelter and equipment per 100 hens has been used on each farm. The annual charge made for depreciation and upkeep amounts to 8 per cent of the inventory value.

To cover miscellaneous overhead items a charge from \$50 to \$100 has been made against each farm in the suggested systems.

Taxes: The tax rate on the farms that were studied were quite variable depending largely upon the local school tax assessments. The figures used for tax charges in the suggested systems that follow approximate an average of the charges on the actual farms.



In each case, the inventory value for land and fencing has been charged with 1 per cent for taxes. The combined valuations of buildings, livestock and equipment have been charged at the rate of one-third of 1 per cent for taxes. This method is somewhat different from that used by assessors and taxing agencies, but it simplifies the calculations, and the total tax charges are about the same.

Interest: On the total inventory investment in land, buildings, equipment, horses, dairy cattle and poultry, an interest charge of 5 per cent has been made. For the number of sows included in the pork enterprise, an interest charge of \$3 per sow-litter has been made. This is at a rate of 5 per cent on the average value of the pork during the year. A four dollar interest charge has been made against each stock cow with calf. This is 5 per cent on an \$80 valuation.

The valuation of feeder cattle, pigs and lambs, based upon average weights and standard prices, has been charged at the rate of 8 per cent interest per annum for the length of time on feed. Eight per cent interest has been used as this is the usual rate for feeder loans.

Interest amounting to 60 cents per crop acre has been charged on an average investment in feed crops amounting to \$12 per crop acre, based upon standard yields and prices.

Insurance: A charge for insurance against loss by fire, lightning and tornado has been made on all farms and amounts to 50 cents per \$100 of the inventory value of the farm buildings.

Labor Costs: A uniform rate for labor has been applied to all of the suggested farming systems and the total labor charges were figured as follows: The total hours of labor performed on each farm were first obtained by applying the standard requirement figures in Tables XVIII, XIX and XX to the crop acreages and livestock. Depending upon the size of business, 15 to 20 per cent of the total was added to care for miscellaneous odd jobs that are necessary on every farm. This result was taken as the total amount of labor to be expended under the particular system.

An allowance of 2,833 hours has been allowed as the operator's labor and the rate of 36 cents per hour has been applied when working out the returns on the investment. On each farm a total of 300 hours of family labor have been included simply to show how and where such an item should be handled in an actual farm budget. The rate of 36 cents per hour for such labor has been used as it has been figured as replacement labor which would have to be hired done, or performed by the operator if family help were not available. The remaining number of hours has been considered as that performed by hired labor at the rate of 36 cents per hour except for corn picking. For the latter, either regular or extra labor has been charged for at the rate of 11 cents per bushel.

The basis of the corn picking rate was 7 cents a bushel for picker's measure. By discounting such measure 20 per cent and adding \$1.20 per day for board and roam, the 11 cents per bushel charge has been used to represent a total picking cost per bushel for standard measure.

The labor rate of 36 cents per hour for labor other than for corn picking has been based upon the usual payment of \$55 per month for hired help. To this has been added \$30 for board and room, making a total of \$85 per month. The results of the study show an average of 235 hours of farm work performed per month throughout the year. These figures, therefore, give an hourly rate of 36 cents for labor that includes board and room.

Prices: The prices that have been used for products to be sold in the suggested farming systems as well as some of the price variations used in the reorganized systems are presented in Table XII. The medium prices only have been used for the suggested systems. These prices are not a forecast of what prices will be but merely a relationship that seems to be normal. Post-war figures were used as a guide in making up this list. The high level and low level prices are likewise arbitrary figures with no attempt made at forecasting. It is realized that there is a multitude of various price combinations, and the three groups shown in the table are used to indicate how the current price level might be used in making up a farm budget.

For feeder stock the differences between the buying and selling prices, the margin has been kept constant under the three price levels that are presented; with beef, for example, this spread has been maintained at 3 cents, which has been the usual spread for the past 10 years. Under low price level conditions, a wider margin is necessary than is the case under high price levels. Likewise, the spread necessary for calves and lightweight stuff need not be so great as for heavy cattle under the same price conditions. The margins indicated in Table XII take into account all these factors and are to be used merely as a guide.

Adjustments for Actual Farms

One of the purposes of this bulletin is to furnish a handbook of information for use as a guide in making out budgets when planning a farm reorganization. The six suggested systems, as has been stated, are presented for that purpose. Tables given in the appendix have been used both for the suggested systems and for the reorganization plans that follow, when budgeting specific farms.

By presenting the following organizations of actual farms, together with reorganized systems for the same farms under various price conditions, it is expected that the methods used will be made more realistic. Three of the most common sizes of farms have been used; namely, a 160-acre farm, a half-section farm and a 480-acre farm. On these farms standardized yields and prices have been used in order to make the returns comparable with the reorganized systems. For this reason, the returns actually made during 1928, and which are given in Table I, do not correspond with the returns shown here in the set-ups for the original systems.

There are a great number of possible price changes, and the reorganizations based upon some such changes are presented to indicate a few of the possible rearrangements that might be made because of such price changes. In order to emphasize this possibility, it has

been assumed in each case that the price change used pertained to the most important enterprise on the farms under consideration.

It should be remembered that the reorganized systems are merely suggestions and are not intended as ideals, even for the particular farms used as illustrations. Should a farm be reorganized based on the principles used herewith, the farm income should be materially increased as a result. With a better system, it should also be possible to increase yields per acre, thus giving still greater returns and to make some saving in cash cost items, especially for labor.

Farm No. 11 (Table V, System A) was the best balanced farm in the group studied. For this reason it was difficult to plan a budget to show much improvement. There are a few weak points, however, in the original system which have been corrected in the

Table V
ACTUAL FARMING SYSTEM ON A 160-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

	Suggested Systems			
	Actual System	A based on medium prices	B based on medium prices	C based on low pork prices
Livestock kept: (numbers)				
Dairy cows	8	8	10	
Dairy heifers, 2 year olds		2	2	
Dairy heifers, yearlings..		2	2	
Dairy calves	7	7	9	
Dairy bull		1	1	
Feeder cattle, home raised drylot fattened to 1000 pounds	8			
Feeder yearlings, home raised, fattened to 900 pounds		5	7	
Feeder yearlings, spring purchased, fattened to 900 pounds		21	26	
Feeder calves, drylot fat- tened to 850 pounds...			14	
Swine, May litters, sold Mar. @ 260 pounds...	15			
Mar. litters sold Sept. @ 220 pounds.....		14		
Sept. litters, sold Mar. @ 220 pounds.....		6		
May litters, sold Mar. @ 320 pounds.....			1	
Crop acres:				
Corn, 2 fields.....		68†	68†	
Small grain, 1 field.....		34	34	
Sweet Clover, 1 field.....		34	34	
Alfalfa	12	17	17	
Net meat production:(pounds)				
Beef	7,130	12,300	20,700	
Pork	29,820	28,400	16,160	
Man labor requirements: (hours)				
Livestock	2,478	2,696	2,850	
Crops, except corn husking.	886	862	862	
Corn husking	461	347	347	
Miscellaneous	765	781	812	
Total labor requirements...	4,590	4,686	4,871	
Average investment:				
Livestock @ 8% for period fed		\$ 938	\$ 1,718	
Other investments @ 5%	31,540	31,328	31,248	

(Continued)

Table V—Continued
ACTUAL FARMING SYSTEM ON A 160-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

Income and Expense Items	Actual Systems		Suggested Systems			
	A		B		C	
	Amount	Value	Amount	Value	Amount	Value
	Dollars		Dollars		Dollars	
Receipts:						
Livestock						
Cows			2	168	2	164
Beef, pounds	7,130	749	22,500	2,475	39,500	4,260
Pork, pounds	29,820	2,823	28,400	2,698	16,160	1,292
Butterfat, pounds ..	2,055	863	1,900	798	2,250	945
Poultry, pounds	742	148	700	140	700	140
Eggs, dozen	1,053	263	600	150	600	150
Crops						
Corn, bushels	500	350				
Total receipts		5,206		6,429		6,951
Expenses:						
Livestock						
Beef, pounds			12,600	945	21,200	1,590
Purchasing, marketing	212			340		388
Veterinary, medicines	39			48		40
Crops						
Seeds	40			54		54
Commercial feeds ..	82			66		42
Oats, bushels					500	200
Twine, threshing	59			63		63
Shelling, grinding, etc.	108			112		96
Labor						
Hired, unpaid family	467			542		609
Corn husking	337			225		224
Replacements, upkeep	782			798		800
Taxes, insurance	256			251		252
Incidentals	50			50		50
Total expenses		2,432		3,494		4,408
Farm income		2,774		2,935		2,543
Operator's labor and management wage		1,197		1,294		843
Rate earned on investment		5.6 %		5.9 %		4.6 %

*Sizes ranged from 27 to 38 acres.

†Size of fields, 34 acres.

reorganized plans. No definite cropping practice was followed and the pork enterprise was somewhat overemphasized. Although dairy production in 1928 was above average, the herd was not handled in a manner conducive to maintain profitableness. A lack of adequate crop shelter and insufficient livestock to utilize the crop produced were other faults on this farm which were taken into consideration in the reorganization.

As pork production is of most importance on many quarter section farms in the area, an additional suggested system is presented for Farm No. 11 which is based upon a low price level for hogs. A return of 4.6 per cent on the investment is likely under the conditions as shown in Table V, System C. Had low pork prices prevailed with the organization as set up in System B, a return of only 4.2 per cent would have been made. On such a farm, even in view of lower prices for pork, it is more economical to reduce the pork enterprise than to eliminate it. This is true for other major enterprises, but such reductions must be met with increases in other enterprises. Occasionally this may necessitate the sale of some

crops for cash as a temporary policy. It is here that a farm budget can perhaps be of greatest value.

On Farm No. 2 (Table VI, System A), a 320-acre farm, two points may be criticized: First, an undesirable cropping plan has been established and second, insufficient livestock is handled for best returns under normal price conditions. Both of these points

Table VI
ACTUAL FARMING SYSTEM ON 320-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

Enterprise factors	Suggested Systems		
	A based on medium prices	B based on medium prices	C
Livestock kept: (numbers)			
Dairy cows	5	8	8
Dairy heifers, 2 year olds	2		
Dairy heifers, yearlings..	1		
Dairy Bull	1		
Stock cows	2	12	12
Stock heifers, 2 year olds		3	3
Stock heifers, yearlings..		4	4
Stock calves	5	18	18
Stock bull		1	1
Feeder cattle, home raised	4	14	14
Feeder yearlings pur- chased, drylot fattened to 950 pounds.....	22	38	
Feeder yearlings spring purchased, pastured, sold October		31	
Feeder calves, winter roughed, pastured, sold October			17
Swine, May litters, sold Mar. @ 300 pounds....	16		
Mar. litters, sold Sept. @ 220 pounds.....		14	10
Sept. litters, sold Mar. @ 220 pounds.....		8	4
Feeder pigs, sold Mar. @ 275 pounds.....		60	
Sheep, Ewes		20	20
Ewe lambs		5	5
Lambs, fattened to 85 pounds		20	20
Ram		1	1
Feeder lambs, fattened to 85 pounds.....			300
Crop Acres:			
Corn, 3 fields.....		135‡	135‡
Small grain, 2 fields....		90	90
Sweet clover	22	45	45
Alfalfa	27	23	23
Native pasture	17	12	12
Net meat production:(pounds)			
Beef	10,655	39,300	23,800
Pork	28,670	38,865	22,720
Mutton		2,200	6,925
Man labor requirements:			
(hours)			
Livestock	2,465	3,641	3,271
Crops, except corn husking.	1,721	1,732	1,772
Corn husking	748	680	680
Miscellaneous	740	908	858
Total man labor require- ments	5,674	6,961	6,581
Average investment:			
Livestock @ 8% for per- iod fed	\$ 750	\$ 3,446	\$ 2,550
Other investment @ 5%.	56,457	56,981	56,699

(Continued)

Table VI—Continued
ACTUAL FARMING SYSTEM ON A 320-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

Income and expense items	Actual Systems		Suggested Systems			
	A		B		C	
	based on medium prices		based on medium prices		*	
	Amount	Value	Amount	Value	Amount	Value
	Dollars		Dollars		Dollars	
Receipts:						
Livestock						
Cows	1	84	5	420	5	420
Beef, pounds	23,755	2,494	69,500	7,432	27,000	2,970
Mutton, pounds			1,700	187	25,925	2,852
Ewes			4	25	4	25
Pork, pounds	28,670	2,724	46,365	4,405	22,720	1,931
Butterfat, pounds	1,116	469	2,000	840	2,000	840
Poultry, pounds	700	140	700	140	700	140
Eggs, dozen	655	164	600	150	600	150
Wool, pounds			225	68	225	68
Crops						
Corn, bushels	2,000	1,400			1,900	1,710
Small grain, bushels	1,530	1,110			1,200	960
Alfalfa, tons	15	188				
Total receipts		8,773		13,667		12,065
Expenses:						
Livestock						
Dairy cows			2	200	2	200
Beef calves			38	1,368	17	782
Beef, pounds	14,300	1,073	18,600	1,395		
Pork, pounds			7,500	788		
Mutton, pounds					19,500	1,755
Purchasing, marketing		331		800		560
Veterinary, medicines		50		82		68
Crops						
Seeds		48		73		73
Commercial feeds		12		37		30
Twine, threshing		193		138		142
Shelling, grinding, etc.		136		152		150
Labor						
Hired, unpaid family		754		1,241		1,105
Corn husking		484		437		437
Replacements, upkeep		1,089		1,138		1,138
Taxes, insurance		471		481		480
Incidentals		75		75		75
Total expenses		4,716		8,405		6,995
Farm income		4,057		5,262		5,071
Operator's labor and management wage		1,174		2,137		2,032
Rate earned on investment		5.3%		7.0%		6.9%

*Based on beef margin two cents narrower, hog prices one cent lower and a high price level for grain crops.

†Size of fields ranged from 25 to 55 acres.

‡Size of fields, 45 acres.

have been considered in the reorganized plan. The owner on this farm is already convinced of the necessity of providing clean hog lots. After the old buildings on the place are removed it will be possible to establish the McLean County system without much difficulty. The non-tillable pasture in the northeast corner of the farm (see figures 6 and 7) furnishes an excellent night pasture and a good place to run calves. In the reorganized plan, the dairy enterprise has been increased in order to more fully utilize the barn room that is available. Such an increase will also provide more chore work for the hired man who will be employed the year round.

Should the outlook indicate a less favorable livestock situation, and an improvement in grain prices, the system given in Table 6, System C, might be established. Should such price changes occur, the return from the system outlined in System B would be 1.4 per cent less than the one given in System C.

Farm No. 1 (Table VII, System A) a 480-acre farm, had an actual return in 1928 of 8.4 per cent on the investment as given in Table I. That this was due very largely to the beef cattle price situation is clearly shown by the 4.3 per cent return from the actual production but with medium prices as shown in Table VII, System B. This farm offers greater possibilities for a profitable reorganization than most of the farms studied. This is not surprising, as weaknesses in a large business are more readily observed. Such a business presents possibilities of large returns or large losses, and for this reason a farm budget is very important. A small farm may have a similar faulty organization but the faults will be less conspicuous in a study of this kind.

A more convenient farmstead arrangement is very desirable on this farm. (See figures 2 and 3). With an additional investment that would more than pay for itself in a short time, a new layout could be established that would provide dryer and more sanitary feed lots for cattle, a convenient feeding arrangement, and a sanitary hog lot system. Inadequate crop storage space was one of the shortcomings on this farm and the loss of grain by waste and rats was one cause for the high feed requirements charged against both hogs and cattle.

Although the field layout on this farm was fairly good, an improvement is possible by establishing a systematic crop rotation as outlined in figure 9. Lack of system in the pork enterprises combined with the impossibility of sanitary practices, presents the possibility of improvements which have been included in the reorganized plan. Both the dairy and poultry enterprises were too large, demanding too much chore labor on a farm with so much other feeding to do as this one had.

One more important weakness on this farm was the inferior grade of some of the purchased feeder cattle. It was partly because of such feeders that the feed requirements on this farm were considerably higher than the average.

It will be noticed that the reorganized system does not necessitate the purchase of any feed. On the other hand, more meat is produced than in the original system. This is possible because of a more efficient utilization of home grown feeds which results from using thrifty livestock. This in truth is brought about by sanitation provided in the new farmstead arrangement.

Lamb production is introduced in the suggested systems to utilize roughage that would otherwise be wasted. Should beef prices turn downward the mutton and pork enterprises might well be increased and the purchase of feeder cattle reduced. Such a system is outlined in Table VII, System C.

Suggested Farming Systems

It is impossible to give suitable suggestions for every farmer because each farm has problems that are peculiar to itself, and in the suggested farming systems that follow the intention is to show methods of budgeting that may serve as a guide to anyone who attempts to set up a budget for a particular farm. When making a budget one should use data which apply to his own specific business if possible.

In each of the following six cases, the yields, requirements, costs and prices have been kept at the same unit figures to make direct comparisons possible. These systems are not intended as ideal organizations for the different sizes of farms used, but merely as helps for making out budgets for farming systems that are similar, and certain enterprise combinations have been employed that have merit. Dairying has been given more prominence on the smaller farms, while feeding enterprises mark the systems on the larger farms. This system was followed so as to utilize labor that might otherwise be unemployed on the smaller farms, and to utilize the roughage produced on the larger farms.

Since larger returns, more economical use of labor and equipment, and the maintenance of soil fertility can best be accomplished on farms in this area where grains and roughage are marketed through livestock, only one system is shown where a surplus of grains is disposed of by cash sales. With a price level different from the one used in working up these systems, such a system could be modified without much trouble so as to become a livestock farm.

A brief discussion of the six suggested systems is given here to set up the assumed circumstances on each farm. It is possible that a farmer with a half section farm, 80 per cent of which is tillable, might use System C, Table VIII, as a guide in making out a budget, although System C is for a quarter section farm.

System A: A 160-acre farm having all land tillable on which a four year rotation is to be established. It is planned to have enough livestock to utilize all feed produced and to avoid the purchasing of feed other than protein supplements. This may be termed a well balanced farm, Table VIII.

System B: A 160-acre farm having all land tillable on which a four year rotation is suggested. Unlike System A the livestock in this plan will necessitate the purchase of additional feed. A silo is suggested, and the dairy and pork enterprises predominate. Table VIII.

System C: A 160-acre farm with only 80 per cent of the land tillable, with 25 acres in native grass. A three-year rotation is suggested with stock cows and feeder lambs to utilize the available roughage. Table VIII.

System D: A 240-acre farm that is 80 per cent tillable, having 38 acres in native grass. A four-year rotation is suggested and an overbalance of livestock which necessitates the purchase of additional feeds. Pork and beef are the important enterprises in this system. Table IX.

System E: A 320-acre, all tillable farming system that provides for a surplus and cash sale of some crops. A six-year rotation is suggested. This system is flexible and provides an excellent opportunity to take advantage of price changes for either crops or livestock. Table IX.

System F: A 480-acre farm that is 80 per cent tillable for which a six-year rotation is suggested. With 72 acres of native

Table VII
ACTUAL FARMING SYSTEM ON A 480-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

Enterprise factors	Actual System			Suggested Systems		
	A based on medium prices	B based on medium prices	C based on low beef prices	A based on medium prices	B based on medium prices	C based on low beef prices
Livestock kept: (numbers)						
Dairy cows	12	8	8			
Dairy calves	12					
Stock cows	40	40	30			
Heifers, 2 year	3	10	8			
Heifers, yearlings	5	11	9			
Calves	38	45	34			
Bulls	1	1	2			
Feeder cattle, home raised	33	33	25			
Yearlings, fall purchased, drylot fattened to 1000 pounds		100				
Calves, purchased, drylot fattened to 880 pounds	87		52			
Swine, Mar. litters, sold Sept. @ 220 pounds...	32	16	20			
May litters, sold Mar. @ 320 pounds		8				
Sept. litters, sold Mar. @ 220 pounds			16			
Feeder pigs, sold Mar. @ 275 pounds	62	105				
Feeder pigs, sold Mar. @ 325 pounds			160			
Sheep, ewes		40	40			
Ewe lambs		10	10			
Lambs, fattened to 85 pounds		40	40			
Rams		1	1			
Feeder lambs fattened to 85 pounds			300			
Crop acres:						
Corn, 3 fields		210†	210†			
Small grain, 2 fields		140	140			
Sweet clover, 1 field		70	70			
Alfalfa	17	38	38			
Net meat production: (pounds)						
Beef	64,500	74,100	45,900			
Pork	61,900	53,255	79,870			
Mutton		4,400	8,125			
Man labor requirements:						
(hours)						
Livestock	5,371	4,980	4,886			
Crops, except corn husking	2,496	2,894	2,894			
Corn husking	760	952	952			
Miscellaneous	1,294	1,324	1,310			
Total man labor	9,921	10,150	10,042			
Average investment:						
Livestock @ 8% for per- iod fed	\$ 6,474	\$ 4,791	\$ 3,975			
Other farm investment @ 5%	87,335	90,321	89,876			

(Continued)

Table VII—Continued
ACTUAL FARMING SYSTEM ON A 480-ACRE FARM COMPARED
WITH TWO SUGGESTED SYSTEMS

Income and expense items	Actual System		Suggested Systems			
	A based on medium prices		B based on medium prices		C based on low beef prices	
	Amount	Value Dollars	Amount	Value Dollars	Amount	Value Dollars
Receipts:						
Livestock						
Cows			12	1,008	10	600
Beef, pounds	104,400	10,962	100,000	10,500	67,500	6,075
Baby beef, pounds..			29,700	3,416		
Mutton, pounds			3,400	374	27,625	3,039
Ewes			8	50	8	50
Pork, pounds	69,650	6,617	66,380	6,306	99,890	9,487
Butterfat, pounds ..	2,592	1,089	2,000	840	2,000	840
Poultry, pounds	2,136	427	1,400	280	1,400	280
Eggs, dozen	1,000	250	1,200	300	1,200	300
Wool, pounds			450	135	450	135
Total receipts		19,345		23,209		20,806
Expenses:						
Livestock						
Dairy cows			2	200	2	180
Beef, pounds	39,900	2,992	67,600	5,070	31,200	1,872
Pork, pounds	7,750	814	13,125	1,378	20,000	2,100
Mutton, pounds					19,500	1,755
Purchasing, marketing		1,101		1,395		1,349
Veterinary, medicines		134		124		134
Crops						
Seeds		105		114		114
Commercial feeds		115		840		420
Corn, bushels 4,700.		3,290				
Twine, threshing		283		215		215
Shelling, grinding, etc.		216		218		242
Labor						
Hired, unpaid family		2,278		2,291		2,253
Corn husking		492		616		616
Replacement, upkeep...		1,645		2,121		2,121
Taxes, insurance		715		731		728
Incidentals		100		100		100
Total expenses		14,280		15,413		14,199
Farm income		5,065		7,796		6,607
Operator's labor and management wage		180		2,897		1,795
Rate earned on investment		4.3%		7.1%		6.0%

*Five fields in corn, three in small grains and two in sweet clover; sizes, 22 to 48 acres.

†Size of fields, 70 acres.

grass, a large stock-cow herd is planned for and beef and pork are major sources of income. The use of only home grown feeds has been arranged for. Table IX.

For each suggested system a complete budget was made on forms like those shown in the appendix. Only a summary of these budgets is given in this bulletin in order to conserve space. Standards used in making up the budgets are also given in the appendix.

The yields used in those systems are very conservative, being but slightly higher than the average obtained on the farms studied. It is entirely probable that many good farmers could get better yields

than those used in the budgets, especially after operating a few years under a reorganized plan that includes a good crop rotation, efficient handling of manure, fertility maintenance, livestock sanitation and other profitable farming practices. To indicate the importance of securing better than average yields and cheaper gains, System A is used as an example. With a 10 per cent increase in crop yields and a 10 per cent increase in feeding efficiency, on such a farm, the following surplus would result:

Four hundred sixty-nine bushels shelled corn; 117 bushels oats; 69 bushels barley and approximately 8 tons of alfalfa. At medium

Table VIII
SUGGESTED FARMING SYSTEMS FOR 160-ACRE FARMS

Enterprise Factors	System A all tillable	System B all tillable	System C 80% tillable
Livestock kept: (numbers)			
Dairy cows	8	12	8
Heifers, 2-year	2	3	2
Heifers, yearlings	2	4	2
Calves	7	10	
Bull	1	1	1
Stock cows			12
Heifers, 2 year			3
Heifers, yearlings			4
Calves			18
Feeder cattle, home raised, drylot fattened to 850 pounds			12
Yearlings, purchased, pas- tured, drylot fed to 1,150 pounds	16	21	
Yearlings, home raised, pastured, drylot fed to 1,150 pounds	5	6	
Swine, Mar. litters, sold Sept. @ 220 pounds...	10		
Sept. litters, sold Mar. @ 220 pounds	4		
May litters, sold Mar. @ 320 pounds		16	8
Sheep, ewes	20		
Ewe lambs	5		
Rams	20		
Feeder lambs fattened to 85 pounds			300
Crops: (acres)			
Corn, 2 fields.....	67	67	63
Small grain	33	33	33
Sweet Clover	33	33	33*
Alfalfa	18	18	31
Native Pasture			25
Net meat production:(pounds)			
Beef	16,400	20,900	16,200
Pork	19,880	32,320	16,160
Mutton	2,200		4,650
Man labor requirements:			
(hours)			
Livestock	2,785	3,131	2,628
Crops, except corn husking.	880	1,029	840
Corn husking	350	228	320
Miscellaneous	803	878	758
Total man labor.....	4,818	5,266	4,546
Average investment:			
Livestock @ 8% for per- iod fed	\$ 1,820	\$ 2,366	\$ 600
Other farm investment @ 5%	30,779	33,115	31,114

(Continued)

Table VIII—Continued

SUGGESTED FARMING SYSTEMS FOR 160-ACRE FARMS

Income and expense items	System A		System B		System C	
	Amount	Value	Amount	Value	Amount	Value
Receipts:		Dollars		Dollars		Dollars
Livestock						
Cows	2	168	3	252	5	420
Beef, pounds	23,000	2,415	29,900	3,140	10,200	1,071
Mutton, pounds	1,700	187			25,650	2,822
Ewes	4	25				
Pork, pounds	19,880	1,889	32,320	3,070	16,160	1,535
Butterfat, pounds ..	1,900	798	3,450	1,449	2,000	840
Poultry, pounds	700	140	700	140	700	140
Eggs, dozen	600	150	600	150	600	150
Wool, pounds	225	67				
Total receipts		5,839		8,201		6,978
Expenses:						
Livestock						
Beef, pounds	9,000	675	12,600	945		
Mutton, pounds					21,000	1,890
Purchasing, marketing		294		404		391
Veterinary, miscel. ..		50		53		46
Crops						
Seeds		53		53		63
Commercial feeds ..		48		225		42
Twine, threshing ..		65		70		58
Shelling, grinding ..		91		155		79
Corn, bushels			1,550	1,085		
Labor						
Hired and unpaid						
family		589		794		501
Corn husking		226		147		207
Replacement, upkeep...		773		906		786
Taxes, insurance.....		250		266		239
Incidentals.....		50		50		50
Total expenses		3,164		5,153		4,352
Farm income		2,675		3,048		2,626
Operator's labor and						
management wage		990		1,203		1,022
Rate earned on investment		5.1%		5.7%		5.1%

*One field of small grain seeded to sweet clover for green manure.

prices, this surplus would amount to about \$516, which is better than 1½ per cent on the investment. If this surplus were marketed in the form of pork, the increased return would amount to about \$725, or better than 2 per cent on the investment.

Table IX
SUGGESTED FARMING SYSTEMS FOR 240-ACRE FARMS

Enterprise Factors	System D 80% tillable	System E all tillable	System F 80% tillable
Livestock kept: (numbers)			
Dairy cows	8	8	4
Dairy heifers, 2-year olds	2	2	
Dairy heifers, yearlings..	2	2	
Dairy calves	7		
Dairy bull	1	1	
Stock cows		20	50
Stock heifers, 2 year olds		5	12
Stock heifers, yearlings..		6	13
Stock calves		25	52
Stock bulls			2
Feeder cattle, home raised	5	17	39
Feeder calves, purchased in fall, winter roughed, pastured, fed to 1,000 pounds	10		
Feeder yearlings, pur- chased following fall, fed to 1,000 pounds....	37		
Feeder calves, drylot fat- tened to 850 pounds....		25	35
Feeder yearlings pur- chased in spring, pas- tured, fed to 975 pounds			42
Swine, Mar. litters, sold			
Sept. @ 220 pounds....	12	12	20
Sept. litters, sold Mar. @ 220 pounds.....	8		10
Feeder pigs, sold Mar. @ 275 pounds.....		42	
Sheep, ewes	40		20
Ewe lambs	10		5
Lambs fattened to 85 pounds	40		20
Rams	1		1
Crop acres.			
Corn	76	141	180
Small grain	76	94	120
Sweet Clover	38*	47	60
Alfalfa	38	24	30
Native pasture	38		72
Net meat production:(pounds)			
Beef	24,350	32,400	73,700
Pork	28,400	22,790	42,600
Mutton	4,400		2,200
Man labor requirements:			
(hours)			
Livestock	3,260	3,221	3,357
Crops, except corn husking.	1,258	1,771	2,410
Corn husking	360	799	816
Miscellaneous	976	1,158	987
Total labor requirements.	5,854	6,949	7,570
Average investment:			
Livestock @ 8% for per- iod fed	\$ 2,063	\$ 905	\$ 4,330
Other investment @ 5%..	41,594	60,048	83,120

(Continued)

Table IX—Continued

SUGGESTED FARMING SYSTEMS FOR 240-ACRE FARMS

Income and expense items	System D 80% tillable		System E all tillable		System F 80% tillable	
	Amount	Value	Amount	Value	Amount	Value
Receipts:						
	Dollars		Dollars		Dollars	
Livestock						
Cows	2	168	7	588	13	1,092
Beef, pounds	50,000	5,250	34,000	3,570	98,500	10,342
Mutton, pounds	3,400	374			1,700	187
Ewes	8	50			4	25
Pork, pounds	28,400	2,698	28,040	2,664	42,600	4,047
Butterfat, pounds ..	1,900	798	2,000	840	1,000	420
Poultry, pounds	700	140	700	140	700	140
Eggs, dozen	600	150	600	150	600	150
Wool, pounds	450	135			225	68
Crops						
Corn, bushels			2,000	1,400		
Barley, bushels			1,300	780		
Total receipts		9,763		10,132		16,471
Expenses:						
Livestock						
Dairy cows					1	100
Beef, pounds	28,050	2,104			25,200	1,890
Beef calves			25	900	35	1,260
Pork, pounds			5,250	551		
Purchasing, marketing		560		440		1,039
Veterinary, medicines		70		65		131
Crops						
Seeds		76		76		96
Commercial feeds ..		60		48		60
Corn, bushels 1000..		700				
Twine, threshing ..		117		139		198
Shelling, grinding, etc.		116		156		178
Labor						
Hired, unpaid family		958		1,194		1,412
Corn husking		233		517		528
Replacements, upkeep..		980		1,195		1,845
Taxes, insurance.....		345		481		690
Incidentals.....		60		80		100
Total expenses		6,379		5,842		9,527
Farm income		3,384		4,290		6,944
Operator's labor and management wage ...		1,139		1,215		2,442
Rate earned on investment		5.4%		5.4%		6.8%

*One field seeded to sweet clover for green manure.

Appendix

In the text, reference has been made to the forms and standards that were used in setting up and testing out the farming systems that have been suggested. A complete set of these are given in the following tables with brief instructions as to the use of each one. These tables giving standards apply more specifically to farming systems in the area studied, but with modification they may be used as a guide for making up farm business adjustments in other type-of-farming areas.

It is repeated here that more than one budget will likely be necessary before a satisfactory organization can be decided upon. Should a new plan necessitate a radical change from the present system, in all probability such adjustments could most economically be made over a period of from two to five or more years instead of a single season. In such a case, intermediate budgets that will promote the final plan in a systematic manner may well be considered. Even while a reorganization is being developed, price changes or other factors may make certain alterations in the original plans advisable. Such situations would merely emphasize the need of well planned budgets for profitable returns.

When beginning to plan adjustments, blank forms similar to those in the following pages should be made. Items listed in the

Table X
BLANK FOR COMPARING DESCRIPTIONS OF PROPOSED FARMING SYSTEMS

Item	Number, Acres or Other Description		
	Original Plan	First New Plan	Second New Plan
Livestock:			
Work horses			
Dairy: cows			
2-year heifers			
Yearling heifers			
Heifer calves			
Stock cattle			
Cows			
Yearling heifers			
Yearling steers			
Other Cattle			
Bulls			
Ewes			
Lambs			
Sow litters, spring			
Fall			
Feeder pigs			
Poultry			
Crops:			
Corn, husked			
Fodder			
Silage			
Pasture			
Oats			
Barley			
Wheat			
Flax			
Alfalfa hay			
pasture			
Other hay			
Pasture			
Man labor requirements			
Investment:			
at 5 per cent			
at 8 per cent			

Table XI

STANDARD PRODUCTION PER ANIMAL UNIT, CASH COSTS AND PRODUCTION SEASONS FOR LIVESTOCK USED IN PLANNING ADJUSTMENTS ON FARMS

Livestock Unit	Production Weights		Net Production Per Unit	Cash Cost Per Unit			Production Season	Days on Farm	Animal Unit
	Initial	Final		Purchasing	Marketing	Miscl.*			
Work horse			1,000 hrs.			.75		365	1.
Dairy cow†					7.20	1.00		365	1.
	Pounds		Pounds Gain						
Heifer, 2-year	700	1,000	300					365	.75
Heifer, yearlings	400	700	300					365	.55
Heifer calf	80	400	160					365	.25
Veal calf	80	160	80		1.00			70	
Stock cow and calf.....			340		7.20	1.00		365	1.20
Baby Beef	400	900	500	1.00	5.40	.10	Oct.-May	210	.40
Steer calf	400	850	450	1.00	5.10	.10	Oct.-June	225	.40
Steer, yearling	650	1,000	350	1.30	6.00	.10	Oct.-Apr.	180	.41
Steer, medium heavy.....	850	1,150	300	1.70	6.90	.10	Oct.-Mar.	135	.37
Steer, winter roughed.....	500	675	175	1.00			Oct.-Apr.	180	.29
Summered pastured	675	850	175	1.35			Apr.-Oct.	180	.38
Summer fattened	600	900	300	1.20	5.40	.10	Apr.-Oct.	180	.38
Ewe† .....						.25		365	.18
Feeder lamb	65	85	20				Oct.-Jan.		
Sow litter, 6 pigs.....			2,020**		9.60	1.50	May-Mar.	300	.92
			1,420		8.60	1.50	Sept.-Mar.	200	.46
Feeder pig	125	275	150	.25	1.35		Dec.-Mar.	100	.06
Feeder pig	125	325	200	.25	1.60		Oct.-Mar.	165	.10
100 hens, meat			700			5.00		365	2.
Eggs			600 doz.						

*Includes all veterinary and medicine, shoeing, castrating, vaccinating, shearing, etc.

†Production, 175 to 325 pounds butterfat, 4 per cent milk; 5 per cent deduction for calves fed whole milk. Cream gathered on route and cost of gathering deducted from gross returns.

‡Production, 105 pounds mutton, 9 pounds wool and 1.25 lamb.

**Production, 320 pounds for May-June pigs, 220 pounds for September pigs, 100 pounds gain per sow.

left hand column of each table given herewith, which will not be included in the proposed farming system should be omitted from the home made forms to save time, space and confusion, and other items should be added if needed. If each home made table is numbered so as to correspond with the forms in the bulletin, it will be much easier to follow instructions. Large sheets of paper should be used so each blank space will be large enough for figures made with a dull pencil. Carbon paper enables one to make several copies of each form at one time.

A description of the important items of a farming system may be listed on a form similar to Table X. Such descriptions will be useful in comparing one plan with another before any single plan is chosen as the one best suited to existing conditions.

Table XII
STANDARD NET PRICES FOR LIVESTOCK AND CROPS USED IN
PLANNING ADJUSTMENTS ON FARMS

Item	Season	Unit	Prices Used*		
			Low	Medium	High
Buying Prices:					
Feeder calves	.....Fall	1 Calf	26.00	36.00	46.00
Feeder Steers	.....Fall	100 lbs.	5.00	7.50	10.00
Feeder pigs	.....Winter	100 lbs.	8.00	10.50	13.00
Feeder lambs	.....Fall	100 lbs.	6.00	9.00	12.00
Corn, shelled	.....Winter	100 bus.	45.00	65.00	85.00
Alfalfa hay	.....	1 ton	10.00	12.50	15.00
Wild hay	.....	1 ton	8.00	9.00	10.00
Protein supplements..	.....	100 lbs.		3.00	
Alfalfa seed	.....	100 lbs.		40.00	
Sweet clover seed....	.....	100 lbs.		10.00	
Twine	.....	100 lbs.		13.00	
Selling Price:					
Beef†	.....Spring	100 lbs.	8.00	10.50	13.00
Pork	.....Sep.-Mar.	100 lbs.	7.00	9.50	12.00
Mutton	.....Winter	100 lbs.	8.00	11.00	14.00
Cows	.....	1 Cow	60.00	84.00	108.00
Ewes	.....	100 lbs.	3.00	5.00	7.00
Poultry	.....	100 lbs.		20.00	
Butterfat	.....	100 lbs.	37.00	42.00	47.00
Wool	.....	100 lbs.	20.00	30.00	40.00
Eggs	.....	100 doz.	20.00	25.00	30.00
Corn, shelled	.....Spring	100 bus.	50.00	70.00	90.00
Oats	.....	100 bus.	28.00	40.00	52.00
Barley	.....	100 bus.	40.00	60.00	80.00
Alfalfa hay	.....	1 ton	10.00	12.50	15.00
Sweet clover hay ....	.....	1 ton	8.00	9.00	10.00

*Where only medium prices are listed, the commodities are of more constant value and the same valuation is used throughout. These prices are to represent quoted prices and do not include purchasing and marketing costs.

†For baby beef add a premium of \$1.00. For beef marketed in October add 50 cents to above values.

To make a summary of net production, gross receipts from net production and cash costs of livestock, a blank form like Table XIII may be used. The numbers of livestock may be taken from Table X and entered in column 1. An expected net production per animal, or standards taken from Table XI should be entered in column 2, after which the total net production figures can be calculated and entered in column 3. The current or estimated price or per pound (or other unit) should then be entered in column 4 and calculations made to secure the totals for column 5. Next the net cost of any feeder livestock purchased should be entered in columns 6 and 7 and any purchasing and marketing costs entered in columns 8 to 11. These and any miscellaneous costs may be based on experience or on figures taken from Table XI. Columns 5, 7, 9, 11 and 13 should be totalled for use in making a summary of the whole farm business.

Table XIII
BLANK FOR MAKING SUMMARY OF NET PRODUCTION AND SALES, AND CASH COSTS OF LIVESTOCK

Column number	Number		Gross Receipts		Cash Costs								
	Live-stock	Net Production		from Net Production		Net Cost of Feeders		Purchasing		Marketing		Miscellaneous	
		Units	Per Unit	Total	Per Unit	Total	Per Unit	Total	Per Unit	Total	Per Unit	Total	Per Unit	Total
	1	2	3	4	5	6	7	8	9	10	11	12	13
LIVESTOCK unit		Pounds	Pounds	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Work horse		X	X	X	X								
Dairy cow													
Heifer, 2-year													
Heifer, yearling													
Heifer calf													
Veal calf													
Stock cattle													
Ewe, mutton													
Wool													
Lambs													
Sow litter													
Feeder pigs													
Poultry													
Meat													
Eggs													
Totals	X	X	X	X		X		X		X		X	

Table XIV
STANDARD FEED REQUIREMENTS FOR LIVESTOCK USED IN PLANNING ADJUSTMENTS ON FARMS

Livestock	Production	Corn	Oats	Barley	Legume	Other rough- age	Silage	Com- mercial protein supple- ment	Pas- ture	Skim milk	Whole milk	A.U.	
												days*	lbs.
1 Work horse.....	1,000 hours	14.3	68.7	bus.		.75	.75					75	
1 Dairy cow*.....	175 lbs. B. F.	21.4	21.9			1.05	.5					170	
	200 lbs. B. F.	19.6	25.	2.1		1.15	.45		5			165	
	225 lbs. B. F.	17.9	28.1	4.2		1.25	.4		10			160	
	250 lbs. B. F.	16.1	31.2	6.3		1.35	.35		15			155	
	275 lbs. B. F.	14.3	34.4	8.3		1.45	.3		20			150	
	300 lbs. B. F.	12.5	37.5	10.4		1.55	.25		25			145	
	325 lbs. B. F.	10.7	40.6	12.5		1.65	.2		30			140	
1 Veal Calf.....	80 lbs. gain												700
1 Dairy calf.....	320 lbs. gain	2.7	9.4	3.1		.45			35	1680		316	
1 Yearling heifer.....	300 lbs. gain	3.6	12.5	4.2		.60	.45		90				
1 2-year old heifer.....	300 lbs. gain	5.4	18.7	6.3		.90	.6		144				
1 Stock cow and calf.....							1.5						
1 Steer calf.....	450 lbs. gain	36.2	28.1			.67							
1 Yearling steer.....	350 lbs. gain	43.8	10.9			.61							
1 Medium heavy steer.....	300 lbs. gain	45.5				.60							
1 Steer calf.....	450 lbs. gain	28.1	21.1			.33		.56	198				
1 Yearling steer.....	350 lbs. gain	32.8	8.2			.30		.79	175				
1 Medium heavy steer.....	300 lbs. gain	34.8				.27		.97	156				
1 Baby beef.....	500 lbs. gain	39.0	29.0			.35		1.	220				
1 Winter roughed yearling.....	175 lbs. gain	3.0					1.5						
1 Summer pastured yearling.....	175 lbs. gain						1.			133			
1 Summer fattened yearling.....	300 lbs. gain	25.7				.32		2.20	149	124			
1 Ewe and get.....		.7	2.2			.27				26			
1 Feeder lamb.....	20 lbs. gain	2.0				.02							
1 Sow litter, March.....	1420 lbs. pork	93.8	17.7	11.8					71	54		568	
1 Sow litter, May-June.....	2020 lbs. pork	133.5	25.2	16.8					121	54		606	
1 Sow litter, September.....	1420 lbs. pork	93.8	17.7	11.8		.21			128			710	
1 Feeder pig.....	150 lbs. gain	12.0							8				
1 Feeder pig.....	200 lbs. gain	16.0							11				
100 Hens.....	700 lbs. 600 doz.	89.3	62.5	20.8					300			5000	

*Based on Table 8, S. D. Bulletin 235, and modified by data from this study.

†Corn stubble not included.

‡Includes feed for breeding herd and for fattening sow after pigs are weaned.

The numbers of livestock listed in Table X should be copied in the first blank column of a form similar to Table XV and be multiplied by the feed requirements given in Table XIV to give the total requirements for each class of stock. Then totals should be made of each kind of feed needed. To secure a balanced system it is best to first plan for the disposal of roughage by feeding to cattle or sheep. Hogs are usually best for consuming concentrates. Other feed requirements than those given in Table XIV may be used so as to meet each farmer's standards. Barley may be substituted for corn, in part, at a ratio of 1.1 pounds of barley for 1. pound of corn. Approximately 300 pounds of silage and 5 pounds of protein feed will replace 100 pounds of legume hay. Eight to nine per cent of corn fed to cattle is not digested and may be used as hog feed.

Table XV
BLANK FOR MAKING SUMMARY OF FEED REQUIREMENTS OF LIVESTOCK

Livestock	Number	Corn bus.	Oats bus.	Barley bus.	Legume hay lbs.	Wild hay Acres	Fodder Acres	Silage lbs.	Sw.Cl. pasture Acres	Native pasture Acres	Protein feeds lbs.	Milk gals.
Horses												
Dairy cows												
3-year olds												
Yearlings												
Calves												
Hull												
Stock cows												
Feeders												
Winter roughed												
Summer pastured												
Ewes												
Feeder lambs												
Hogs												
litters												
litters												
Feeder pigs												
Hens												
Total												

Table XVI

STANDARDS OF PRODUCTION AND REQUIREMENTS OF CROPS USED
IN PLANNING ADJUSTMENTS ON FARMS*

Crop	Production per acre	Seed per acre	Twine per acre	Harvesting cash costs
Grain:				
Corn, husked	40	bus.	8 lbs.	5 lbs. 11c bu.
Oats	50	bus.	3 bus.	3 lbs. 3c bu.
Barley	35	bus.	2 bus.	3 lbs. 4c bu.
Roughage:				
Alfalfa hay	2	ton	10 lbs.	
Sweet clover hay	2½	ton	12 lbs.	
Other hay	1	ton		
Corn cut for fodder	2½	ton	10 lbs.	
Silage	8	ton	10 lbs.	35c ton†
Pasture: (animal unit days)				
Alfalfa	300			
Sweet clover, 1st year.....	90			
Sweet clover, 2nd year‡.....	225‡			
Other pasture	105			

*Other cash costs: custom plowing \$2.75 per acre for one man, including board, with tractor and 2-bottom plow; feed grinding 15c per cwt.; shelling 2½c per bushel.

†Cost for equipment and fuel.

‡If one ton of hay is cut, 135 A.U. days of pasture remains.

The acreage of different crops listed in Table X should be copied in column 1 of a form like Table XVII, and expected yields, or the standard yields per acre given in Table XVI should be placed in column 2. The total yield can then be calculated and entered in column 3. Seed required for the next crop should be listed in columns 4 and 5, and feed requirements should be copied from Table XV in column 6. The totals of these two requirements should then be subtracted from the total production, entering the balance of each crop in column 7. In a similar manner the amounts and cost of twine, the amounts and costs of any seed purchased, and the costs of threshing can be entered in columns 8 to 15, and columns 9, 11, 13 and 15 should be totaled for use in Table XXIV.

Table XVII

BLANK FOR MAKING SUMMARY OF PRODUCTION, SEED AND FEED REQUIREMENTS AND CASH COSTS OF CROPS

	Num- ber acres	Production		Seedrequired		Feed re- quired for live- stock	Bal- ance of crop	Twine required		Cash Costs					
		Per acre	Total	Per acre	Total			Per acre	Total	Twine		Seed		Threshing	
										Perlb.	Total	Per unit	Total	Per unit	Total
Column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										Dol- lars		Dol- lars		Dol- lars	
Crops															
Corn, husked															
Fodder															
Silage															
Pasture															
Oats															
Barley															
Wheat															
Alfalfa, hay															
pasture															
Sweet clover, hay															
pasture															
Other hay															
Other pasture															
Other crops															
Total		X	X	X	X	X	X	X		X		X		X	

Table XVIII
STANDARD MAN LABOR REQUIREMENTS FOR LIVESTOCK USED IN
PLANNING ADJUSTMENTS ON FARMS

Livestock	Days on Farm	Number in Herd	Man Labor Per Unit	Total Man Labor
Work horses	365	5	55.	275
		7	55.	385
		8	55.	440
		10	55.	550
Dairy cows*, (250 lbs. B.F.).....	365	4	175.	700
		8	157.	1,256
		12	140.	1,680
		16	122.	1,952
Stock cows and calves.....	365	40	12.5	500
Steers in feedlot, (6 months).....	180	40	9.	360
		60	7.5	450
		80	6.4	510
		100	5.4	540
Steers, winter roughed.....	180	40	7.5	300
Steers, summer pastured.....	180	40	2.	80
Steers, summer fattened.....	180	40	4.	160
Sheep and lambs.....	365	40	2.5	100
Feeder lambs	90	300	.6	180
Sow litters, spring farrowed.....	365	4	50.	200
		8	47.5	380
		12	43.3	520
		16	38.7	620
		20	34.	680
2/3 spring, 1/3 fall farrowed.....		12	50.	600
		18	42.2	760
		24	35.	840
		30	30.	900
Feeder pigs	120		1.	
Poultry, (100 hens, 20 settings).....	365	100	225.	225

*Includes bull and young stock necessary for replacement (1 heifer a year per 4 cows). Labor requirement based on hand milking only and cows freshened two-thirds in fall and one-third in spring.

Table XIX
STANDARD SEASONAL LABOR REQUIREMENTS OF CROPS, USED IN
PLANNING ADJUSTMENTS ON FARMS*

Field Operations	Per Acre		Season	Week Days Available
	Man Labor	Horse Work		
Corn:				
Fall plowing	1.05	5.25	Aug. 4-Oct. 27	62 @ 8 hrs.
Spring work	3.	13.05	Apr. 15-May 26	35 @ 8 hrs.
Cultivating	2.25	9.	May 27-July 7	27 @ 9 hrs.
Cutting, shocking for silage..	4.5	4.5	Aug. 19-Sept. 8	19 @ 9 hrs.
Snapping and husking.....	6.8	13.6	Sept. 23-Dec. 24	62 @ 8 hrs.
Small grain:				
Spring work	1.25	5.5	Mar. 18-Apr. 14	15 @ 8 hrs.
Cutting and shock threshing..	4.15	7.6	July 15-Aug. 18	25 @ 10 hrs.
Alfalfa:				
1st cutting	3.65	7.4	Jun. 10-Jun. 30	11 @ 9 hrs.
2nd cutting	3.15	6.3	July 8-Aug. 4	16 @ 10 hrs.
3rd cutting	2.5	4.9	Aug. 19-Sep. 15	19 @ 9 hrs.

*Based on actual data from the study in 1928.

Table XX

STANDARD LABOR AND EQUIPMENT REQUIREMENTS PER ACRE OF CROPS USED IN PLANNING ADJUSTMENTS ON FARMS

Field Operations	Size of Equipment	Number of Horses	Times Over	Man Labor	Horse Work	Acreage Covered by One Man in:			
						hrs.	hrs.	8 hrs.	9 hrs. 10 hrs.
Seedbed Labor:									
Fall plowing	28"	5	1	2.1	10.5	3.8			
Spring Plowing	28"	5	1	2.	10.	4.			
	16"	3	1	3.8	11.4	2.1			
Discing	10'	5	1	.4	2.	20.			
	8'	4	1	.5	2.	16.			
Harrowing	26'	5	1	.2	1.	40.			
	20'	4	1	.25	1.	32.			
Cultivating	2-Row	4	1	.75	3.		12.		
	1-Row	2	1	1.4	2.8		6.4		
Corn, 40 bushel yield:									
Fall plowing	28"	5	1 1/2	1.05	5.25	3.8			
Spring Plowing	28"	5	1 1/2	1.	5.	4.			
Discing	10'	5	1 1/2	.6	3.	20.			
Harrowing	26'	5	2 1/2	.75	3.75	40.			
Planting	2-Row	2		.65	1.3		13.8		
Cultivating	2-Row	4		2.25	9.		12.		
Total up to harvesting				6.3	27.3				
Hand husking		2		6.8	13.6	1.2	1.3		
Cutting, 2 1/2 ton yield	1-Row	3		1.5	4.5		6.		
Shocking				3.			3.		
Silo filling, 8 ton yield				15.	20.				
Total for hand husking				13.1	40.9				
Small grain, 50 bushel oats yield:									
Discing	10'	2		.8	4.	20.			
Harrowing	26'	5	1	.2	1.	40.			
Seeding, endgate seeder		2		.25		32.			
Cutting	8'	4		.65	2.6		15.4		
Shocking				1.			10.		
Shock threshing		2		2.5	5.				
Stacking		2		2.6	5.2				
Stack threshing		1		1.	1.				
Total for shock threshing				5.4	13.1				
Total for stack threshing				6.5	14.3				
Alfalfa, 2-ton yield in 3 cuttings									
Cutting	6'	2	5	2.7	5.4	10.	11.1		
Raking	10'	2	3	1.2	2.4	22.5	25.		
Stacking		2	3	5.4	10.8				
Total				9.3	18.6				
Sweet clover, 1-ton yield in 1 cutting									
cutting				3.65	7.3				
Road hay per ton				3.	6.				

Labor requirements of both man and horses can be calculated on a form like Table XXI using the number of units given in Table X and the standards given in Tables XVIII, XIX and XX. From the total man hours should be subtracted 3000 hours which represents a farm operator's time for a year, and as many more hours of unpaid family labor as may be expected from the family in the production of crops and livestock. The remainder will represent the amount of hired labor that will be required for the adjusted farming system.

If horses are to be replaced by a 10-20 tractor, the man hours will be reduced approximately 30 per cent.

Table XXI

BLANK FOR MAKING SUMMARY OF MAN AND HORSE LABOR REQUIREMENTS

Enterprise	Number		Man Labor Hours		Horse Labor Hrs.	
	Units	Per Unit	Total	Per Unit	Total	
Horses						
Dairy cows						
Stock cows and calves.....						
Sheep and lambs						
Feeder lambs						
Sow litters						
Feeder pigs						
Poultry						
Corn, to harvest.....						
Harvesting						
Oats						
Barley						
Wheat						
Alfalfa hay						
Sweet clover hay.....						
Other hay						
Total.....	X	X		X		

A form like that of Table XXII is to be used to summarize any items of cash expenses which are not included in any other blanks.

Table XXII

BLANK FOR MAKING SUMMARY OF MISCELLANEOUS CASH COSTS AND CROP RECEIPTS

Item	Number Units	Charge Per Unit	Total Charges Dollars
Shelling			
Grinding			
Gas and oil.....			
Protein feeds			
Grains			
Hay			
Extra labor			
Miscellaneous			
Total costs	X	X	
		Receipts Per Unit	Total Receipts
Grain sold:			
Wheat			
Corn			
Total receipts	X	X	

Table XXIII

STANDARD CHARGES MADE FOR INVESTMENTS, REPLACEMENTS,
UPKEEP, TAXES, INTEREST AND INSURANCE USED
IN PLANNING ADJUSTMENTS ON FARMS

Unit	Investment per unit	Replacement and upkeep
	Dollars	Per Cent
Land, tillable* .....acre	125.	
Non-tillable* .....acre	100.	
Fencing .....rod	.75	10
Water system .....farm	300.	10
Barn .....cow, horse or 1000 lb. small stock	75.	5
Shelter and equipment for.		
steer or cow	5.	20
sow	45.	12
100 hens	400.	8
lamb	1.	20
Silo .....silo	400.	5
Grain storage .....100 bushels	20.	6
Machinery shelter .....farm	300.	6
Tractor .....farm	450.	15
Automobile .....farm	250.	20
Machinery:		
160-acre farm .....crop acre	7.	20
240-acre farm .....crop acre	6.50	20
320-acre farm .....crop acre	6.	20
480-acre farm .....crop acre	5.50	20
Horse equipment .....horse	30.	16
Cow equipment .....cow	10.	10
Work horses .....head	100.	5
Dairy cows .....head	†	
Stock cows .....cow and calf	80.	
Bulls .....head	150.	
Dairy, young stock .....cwt.	10.	
Beef cattle .....head	†	
Hogs .....sow litter	†	
Feeder lambs .....head	†	
Ewes .....head	10.	
Poultry .....100 hens	100.	
Feed Crops .....crop acre	12.	

Tax charge: One per cent of land and fence investment, one-third per cent of other property except feeder stock and feed crops.

Insurance charge: One-half of one per cent of building investments.

Interest charge: Eight per cent on investment in feeder stock for period fed, and five per cent on all other farm property.

*Land only.

†Value ranged from \$70 to \$130 based on butterfat production ranging from 175 to 325 pounds.

‡Value based on average prices and weights used.

• Charges for repairs, upkeep, interest, taxes and insurance of all farm property may be made on a form similar to Table XXIV, using standards given in Table XXIII or any others suiting the farm on which adjustments are planned.

Table XXIV

BLANK FOR MAKING SUMMARY OF CHARGES MADE FOR INVESTMENTS

Farm Property	Unit	Number Units	Invest- ment Per Unit	Total Invest- ment	Charges	
					Rate	Total
			Dollars	Dollars	Per Cent	Dollars
Land, tillable	acre				X	X
Non-tillable	acre				X	X
Fencing, woven wire..	rod					
Barbed wire	rod					
Water system	farm					
Barn						
Shelter and equipment	cattle					
	hogs					
	poultry					
	lambs					
Silo	silo					
Grain storage	100 bu.					
Machinery shelter						
Other buildings						
Tractor						
Truck						
Automobile						
Machinery						
Horse equipment						
Cow equipment						
Other equipment						
Dairy cows					X	X
Stock cows					X	X
Bulls					X	X
Dairy, young stock					X	X
Beef cattle					X	X
Hogs					X	X
Sheep					X	X
Poultry					X	X
Feed crops					X	X
Total		X	X		X	
Taxes		X	X	X		
Insurance		X	X	X		
Interest		X	X	X		
Other Items						
Totals		X	X		X	

A summary of receipts and expenses should be made as the final step in planning farm adjustments. Totals of receipts and expenses should be transferred from forms already filled out to a form similar to Table XXV and calculations made to learn what farm income, operator's labor and management wage and rate of interest on investment may be expected from each newly planned farming system.

Table XXV

BLANK FOR MAKING SUMMARY OF RECEIPTS, EXPENSES AND INCOME OF FARM

	Reference		Amount in Dollars	
	Table	Column	1st Plan	2nd Plan
Receipts:				
Net sales livestock.....	XIII	5		
Cows				
Beef				
Ewes				
Mutton				
Pork				
Butterfat				
Poultry				
Eggs				
Wool				
Crops	XXII	3		
Wheat				
Flax				
Other				
Total receipts				
Expenses				
Livestock	XIII	7		
Cows				
Beef				
Pork				
Lambs				
Purchasing	XIII	9		
Marketing	XIII	11		
Miscellaneous	XIII	13		
Crops				
Twine	XVII	11		
Seed	XVII	13		
Threshing	XVII	15		
Miscellaneous	XXII	3		
Labor, hired and unpaid family.....	XXI	notes		
Replacements, taxes, insurance.....	XXIV	6		
Total expenses				
Farm income (receipts less expenses)....				
Interest on feeder stock @ 8%.....	XXIII			
Interest on other investment @ 5%.....				
Operator's labor and management wage... (Farm income less interest)				
Rate earned on investment.....				