UNIVERSITY OF MINNESOTA
Department of Agriculture
and the
United States Department of Agriculture
Soil Conservation Service

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Second Annual Report of the Farm Management Service for Farmers in Soil Erosion Control Demonstration Areas for the year 1936 (April 1936 to March 1937)

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Second Annual Report of the Farm Management Service for Farmers in Soil Erosion Control Demonstration Areas

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Introduction

Through a joint agreement between the Division of Agricultural Economics of the University of Minnesota and the Soil Conservation Service of the United States Department of Agriculture, a complete farm record service has been made available to farmers in the Erosion Control Demonstration Areas of Minnesota. Farmers in the Gilmore Creek Area at Winona, the Beaver Creek Area at Caledonia, and the Deer-Bear Creek Area at Spring Valley, who were cooperating with the Soil Conservation Service and operating their farms under a complete erosion control program, had the opportunity to keep records. Eighty-one farmers in the three areas completed books in 1936, 25 of these farmers in Gilmore and Deer-Bear Creek Areas having completed their second year of record keeping. A few new cooperators have started keeping record books but they are few in number, and it is to be expected that the number of record keepers will remain about the same.

The work of supervising these records is taken care of by James C. Jensen of Spring Valley, Minnesota, and Austin B. Sanford of Winona, Minnesota, both on the staff of the Soil Conservation Service. The summary and analysis are under the direction of G. A. Pond and W. P. Ranney of the Department of Agricultural Economics of the University of Minnesota. The record books were furnished by the Division of Agricultural Extension, University of Minnesota, which is also cooperating in this study.

Note: Completion of this project was made possible by workers supplied on Federal Students' Work Project, 1936-37, Project No. 41-100, and Project No. 813-120, Minnesota Works Progress Administration. Sponsor: University of Minnesota.

Full cooperation has been given during the past year by members of the several sections of the Division of Operations, Soil Conservation Service, and the Division of Agricultural Extension, University of Minnesota, as well as county agricultural agents in the locality.

Records Kept

The records kept by the cooperators included inventories at the beginning and end of the year, cash receipts and expenses, a report of feed fed to the various classes of livestock, and a record of farm produce used by the family. Supplementary information was also secured during the year regarding crop and livestock production practices.

The cooperators were assisted and supervised in keeping their records by the fieldmen from the Soil Conservation Service, who visited each farm several times during the year. In addition to securing the supplementary information, the fieldmen's duties included numerous services, viz., helping the farmer place uniform values on real estate and equipment, checking the cash and feed records, answering any questions that might arise as to how the entries should be made in the account book, and helping with farm management problems which came up due to changes brought about by the introduction of a complete erosion control program.

At the end of the year, the books were taken to the central office at the University Farm where they were checked for completeness and accuracy. Then the fieldman of the Soil Conservation Service visited each cooperator and asked for corrections and secured any data which had been omitted.

Sixty-eight of the books contained complete household statements which were summarized and tabulated on page 20. This portion of the summary was an extra service given in addition to the regular farm accounts and it was entirely up to the cooperator as to whether he kept that portion of the record or not.

Topography, Soils, Climate

The Gilmore Creek Area, in which 14 records were completed, is located at the southwestern edge of the city of Winona, in Winona county. The valley and side coulees are very narrow with steep sides. The ridges are narrow, varying from a few rods to usually less than one-fourth of a mile in width. The upland soils fall mainly into two types, Clinton silt loam, a forest soil developed on loess, and Dubuque silt loam, a forest soil developed on residual limestone. The valley slopes fall in the Boone Series and soils on the valley floor are mostly included in the Genesee Series. A considerable portion of the steep valley slopes is classified as rough, stony land. Serious sheet and gully erosion has taken place over the area. The annual rainfall of this area is approximately 34 inches and is distributed throughout the year satisfactorily for crop production; approximately 70 per cent occurs between April first and September thirtieth. The winters are cold, and followed by short but warm summers; the annual mean temperature is 46 degrees. Droughts may endure for short periods; or unusual precipitation, with heavy water and soil losses may occur; but these unusual periods are not frequent.

The Beaver Creek Area in which 35 of the records were kept is located in Houston county in the southeastern portion of the state. The area may be divided into two parts, the gently undulating to moderately rolling prairie region of the upper one-third of the watershed, and the undulating to hilly region of the lower two-thirds of the area.

In the upper portion of the area the greatest agricultural development has taken place, since the land is more level, less cut up by ravines, and has a lower degree of erosion all of which permit more land in cultivation and much larger fields. The soil in this section is predominantly a deep prairie soil (Tama Silt Loam) which is high in organic matter, but needs lime for the best production of alfalfa or sweet clover.

The lower two-thirds of the area is composed of a main valley with accompanying tributary valleys surrounded by high steep ridges. The bottom of the valley is excellent corn land but due to annual overflow is not adaptable to other crops. A broad terrace on either side affords excellent soil for cultivated fields many of which extend part way up the lower slopes of the adjoining ridges. Due to the steep character of the ridge slopes about 25 per cent of the area is on land too steep for crops or pasture so is predominantly in woods. On the ridge tops we again find fields with soil very similar to that of the soils on the lower slopes of the ridges. This is a forest soil (Fayette Silt Loam), low in nitrogen, shows a marked response to barnyard manure or legumes in rotation and needs lime for the best growth of alfalfa or sweet clover. Sheet erosion has taken a severe toll and many of the old fields have less than three inches of topsoil remaining.

The Deer-Bear Creek Area, in which 32 records were completed, is located in Fillmore and Mower counties and is drained by the middle branch of the Root River. The topography varies from very gently rolling to almost level land, in the upper part of the area, to very steep, hilly and rough land in the lower end. In many cases the upper end of the area lacks sufficient undulation of surface to allow proper drainage, in contrast to the lower, where creeks have cut deeply into the underlying limestone. The entire area has been glaciated almost equally between soils composed of drift material and of loessial mantle overdrift. Carrington, and Lindley, silt loam soils with glacial drift derivation and Toma, Clinton, silt loams with loess derivation are among the more important soil types of the area. Erosion varies from slight amounts of sheet erosion in the upper reaches of the drainage areas to severe sheet and gully erosion in the middle and lower parts of the area. The mean annual temperature for the area is 45 degrees Fahrenheit, with a range of -37 to 108 degrees, occurring in January and July, respectively. The average growing season is around 150 days with an annual precipitation of 32 to 33 inches well distributed throughout the growing season.

Type of Farming

Agriculture in the three areas covered by this report centers primarily around the dairy enterprise with smaller proportions of hogs, poultry and sheep included. In the Deer-Bear Creek and Beaver Creek Areas a few farmers have both dairy cattle and beef cattle enterprises. Dairy products were sold principally as cream altho a few farmers had an outlet for whole milk. In those cases where cream was sold, the skimmilk was fed to calves, hogs, and poultry.

The principal crops grown are oats, barley, hay, and corn. The proportion of total farm land devoted to crop production and rotation pasture land varies from 40 per cent on some of the rougher farms in the Gilmore Creek Area to more than 80 per cent on some of the Deer-Bear Creek farms, with an average of 59 per cent for all farms studied. Approximately 20 per cent of the areas is devoted to permanent pasture, with twice as much woodland in the Gilmore Creek Area as in the Deer-Bear Creek Area, and an average of 12 per cent of all the farms being handled as protected timber areas.

Purpose of the Project

The farm management section of the Operations Division of the Soil Conservation Service has three main objectives; first enabling the cooperator to know the returns he is getting for his labor and management, second to secure information which when compared with similar data secured on other farms will enable the cooperator to increase his efficiency and organize his farm on a more profitable basis and third to rebalance the farm business in light of economic conditions after the establishment of the erosion control program.

Since success under our present economic order is measured in terms of dollars and cents, and since the profit motive is the governing factor in our modern agriculture, it is important that both the cooperator and the soil conservationist know what returns the farmer is obtaining for his capital, management, and labor. In other words, the farmer's income is the yardstick by which we measure the success of his enterprise and if the soil conservation program is to succeed it must increase or at least maintain the farmer's income. This information may be obtained through farm account books and furnish a common basis from which the conservationist and the farmer may build a better erosion control program for that farm.

In any community we find certain farms above the average yet almost adjoining it will be a farm far below the community standard. Sometimes physical conditions will make it impossible to change the situation, but frequently it is a question of inefficiency and poor management.

Through the records kept for the farm management service, each cooperator furnishes data dealing with the operation of his farm or affecting its income. By comparing this data with that obtained on the most profitable farms the operator can often find many ways of operating his farm more efficiently.

Farms cannot be operated efficiently if the soil has been allowed to become so badly eroded as to reduce crop yields. In order to prevent this, very decided changes have been made in the field plans of the individual farm and in the crop rotations. These changes are bound to upset the fine balance formerly existing on a well-managed farm. Readjustment of labor and livestock is bound to follow and the sooner these readjustments are made the easier it will be. By means of farm account books both the cooperator and the fieldman can see just how the income is being affected and take steps to improve the situation. At the same time, the fieldman is able to get the information which he can apply on other farms in the locality and know that he has concrete evidence to back his statements.

Fortunately most practices which make for efficient farm management are also important measures in good erosion control. In this section of the country livestock farming is in practically every case the most profitable type of operation, but it requires efficient handling if the full benefits are to be received. Good quality pasture throughout the grazing season, high quality roughages for the feeding season, and above all a balanced ration. Good erosion control requires fencing out of very steep hillsides to woods, to prevent silting and gullying of fertile land lower down the slope. Other land that is not so steep but too rough to cultivate makes excellent permanent hayfields and pasture. Of our various permanent hay crops alfalfa is one of the best and without question it is the best roughage we have for dairy cattle. Well balanced rotations make for higher crop yields and at the same time are important factors in good erosion control. In other words, good farm management and good erosion control in this area call for efficient livestock farming, good land utilization and all done with a minimum of labor.

Analysis of the Farm Business

On pages eight and nine are presented financial summaries of the year's business, showing the average results for the 81 farms on which the work was completed for the twelve months' period, April 1936 to March 1937, the average results for the highest one-fifth of the farms in respect to Operator's Labor Earnings, and the average for the lowest one-fifth. In the "your farm" column, in the copy sent to the farmer, the results of his individual farm business are inserted in order that he may compare his figures with the averages of the various groups.

The data on pages 10 to 23 should suggest to each cooperator some possibilities for improvement in his production, control of expenses, and in his organization of the various enterprises and of the business as a whole. There are some variations in soil and climatic conditions and available markets in this area, which, of course, affect the choice of crops and classes of livestock. Each farm is an individual problem and has its particular advantages and limitations in respect to natural resources and markets. However, it is significant that the same general factors account for financial success in both of the soil conservation areas.

Capital Investment in Farm Business

The data on page 7 shows that the average size of the farms in this report was 190 acres. The average farm inventory was $14,060. This does not include the value of the house in which the operator lived. In 1936, 50 per cent of the average farm inventory consisted of land; 22 per cent of permanent improvements; 5 per cent of feeds and supplies; 8 per cent of machinery and equipment; and 15 per cent of livestock, of which about one-third or an average of $692 was the average inventory value of milk cows.

Returns to Operators for Their Labor and Management
(See page 8)

The average cash receipts per farm were $3,077. In addition, farm produce to the value of $361 was consumed by the farm family and there was an average inventory increase of $254 per farm. The total average receipts per farm were the sum of these three items, $3,692. The average total expense per farm, $1,741, includes $1,654 cash expense and an estimated allowance of $87 for board of hired labor. The difference between the total income and total expense figure is $1,951. This is the return which the farmer received for his own labor and management, the services of members of his family and the use of his capital. After deducting a charge of 5 per cent on the average inventory valuation, $703, for the services of capital, there remains $1,248 for the services of the farmer and his family. The average value of family labor used, if computed at hired man's wages, was $241. The average operator's labor earnings are the family earnings less their allowance of $241, or $1,007. This is the return to the farmer for his labor and management over and above a 5 per cent return for his capital and going wages for other members of the family.

The average total value of farm produce used in the house, $361, represents an important item in the farmer's income. This produce is figured at farm prices; if it was purchased at retail prices, the total value would be approximately double this figure. On many farms a saving could be made if more produce were raised on the farm rather than purchased. The table on page 20 shows the average amounts and values for each item included in the total of farm produce used in the house.

Household and Personal Expenses

In the case of a farm with no debt, the family has, besides the operator's labor earnings, two other sources of income to expend for living and personal expense. One is the amount charged as interest on investment, and the other is the amount allowed for family labor. On the other hand, a farm with a heavy debt must pay interest and in most cases at a higher rate than the 5 per cent charged. In these cases, the Operator's Labor Earnings and the allowance for family labor constitute practically the only sources of funds for family living; and if in these cases the farm shows a minus Operator's Labor Earnings more than enough to offset the allowance for family labor, it means that there is no income for family living expenses outside of the farm produce furnished by the farm for the household. These farmers and others, whose family incomes are not sufficient to cover household and personal cash expenses, must go deeper and deeper in debt, in order to meet these expenses.

It is important to know the family income and the reasons why it is not higher. It is also worth-while to know the household and personal expenses and whether they are within the family income. Sixty-eight farmers included in this report kept a detailed record of personal and household expenses. The distribution of these expenses is shown on page 20, with averages for the 68 farms, and for the 14 most profitable and 14 least profitable in this group.

Taking into consideration the number of members (adult equivalents)* in his family and the number in the average family, each farmer can compare his item of expense with those of the average.

*All members of the family including women and children are reduced to a full man equivalent on the basis of relative food consumption; the "other" adult equivalents as shown in table on page 20, are the hired help boarded. They must be added to the adult equivalents as shown for the family in studying the food expense per adult persons.

Summary of Farm Inventories

Items	Your farm	Average of 81 farms	16 most profitable farms	16 least profitable farms
Size of farm (acres)	_____	190	242	186
Size of business (days of prod.work) (1)	_____	550	769	413
Average farm inventory (without house)	_____	$14,060	$17,861	$12,970
Land	_____	6,990	9,099	7,253
Farm improvements	_____	3,049	3,470	2,658
Machinery and equipment (total)	_____	1,205	1,443	975
General machinery and equipment	_____	854	918	789
Tractor	_____	174	295	44
Truck	_____	44	44	14
Auto (farm share)	_____	93	126	71
Gas engine (farm share)	_____	10	10	9
Electrical equipment (farm share)	_____	30	51	49
Feeds and seeds	_____	640	1,006	429
Miscellaneous supplies	_____	26	27	11
Horses (total)	_____	465	526	474
Horses	_____	411	454	416
Colts	_____	54	72	59
Productive livestock (total)	_____	1,685	2,289	1,170
Cows	_____	692	825	605
Other cattle	_____	432	558	226
Hogs	_____	302	487	187
Sheep	_____	168	325	53
Poultry	_____	90	94	98

(1) Explanation of term: "Days of Productive Work".

The total "Days of Productive Work" for any one farm are a measure of size of that farm business. The average number of "ten-hour days" of man labor required per head of productive livestock and per acre of crops is used in combining the crops and the livestock in one single measure of size of business.

The number of days of productive work for each animal and each acre of crops, computed from data presented in Minnesota Technical Bulletin 44, "A Study of Dairy Farm Organization in Southeastern Minnesota", are listed as follows:

Item	Per	No. of days of prod.work	Item	Per	No. of days of prod.work
Cows	Cow	16.6	Corn for grain (husked)	Acre	2.1
Other cattle	Animal unit*	7.6			
Sheep	Animal unit*	2.7	Corn for grain (husk.& shred.)	"	2.8
Poultry	100 hens	20.1			
Hogs	100 lbs.hogs produced	.55	Corn for silage	"	2.6
			Corn hogged	"	1.25
Alfalfa	Acre	1.5	Corn for fodder	"	1.8
Tame & wild hay	"	.6	Sweet corn	"	3.0
Small grain & flax	"	1.0	Potatoes	"	6.4
Small grain hogged	"	.4	Sugar beets	"	4.0
Canning peas	"	2.5			

*Animal Unit represents one cow, one bull, two head of young cattle, seven head of sheep, fourteen lambs, five hogs, ten pigs, or 100 hens.

Summary of Farm Earnings

Items	Your farm	Average of 81 farms	16 most profitable farms	16 least profitable farms
CASH EXPENSES				
Tractor (new & exp.)	$_____	$117	$300	$ 19
Truck (new & exp.)	_____	42	75	11
Auto (new & exp.) (farm share)	_____	92	136	70
Gas engine (new & exp.) (farm share)	_____	5	9	3
Electricity (new & exp.) (farm share)	_____	9	6	9
Machinery and equipment (new)	_____	139	194	69
Machinery and equipment (exp.)	_____	36	52	27
Buildings, fences, tiling (new)	_____	96	263	85
Buildings, fences, tiling (exp.)	_____	39	67	22
Hired labor	_____	167	300	76
Feed for livestock	_____	271	324	265
Other expense for livestock	_____	30	38	32
Horses bought	_____	42	29	42
Cows bought	_____	39	72	58
Other cattle bought	_____	75	33	21
Hogs bought	_____	51	94	8
Sheep bought	_____	43	37	0
Poultry bought	_____	30	27	34
Crop (seed, twine, spray)	_____	108	144	77
Taxes and insurance	_____	204	251	185
General farm	_____	19	37	21
(1) Total cash expense	_____	1,654	2,488	1,134
(2) Decrease in farm inventory	_____	-	-	182
(3) Board for hired labor	_____	87	147	63
(4) Total expense (sum of (1),(2)& (3)	_____	1,741	2,635	1,379
CASH RECEIPTS				
Horses	_____	25	33	18
Cows	_____	122	129	94
Dairy products	_____	812	1,164	615
Other cattle	_____	258	304	121
Hogs	_____	802	1,126	407
Sheep	_____	159	216	46
Poultry	_____	142	69	270
Eggs	_____	136	158	69
Small grain	_____	183	472	62
Corn	_____	8	33	1
Hay	_____	16	18	14
Root crops	_____	24	5	32
Other crops	_____	62	142	10
Miscellaneous	_____	115	268	48
Income from work off the farm	_____	82	188	35
Agricultural Conservation payments	_____	131	168	100
(5) Total cash receipts	_____	3,077	4,493	1,942
(6) Increase in farm inventory	_____	254	1,284	-
(7) Farm produce used in house	_____	361	371	307
(8) Total receipts (sum of (5) & (6)	_____	3,692	6,148	2,249
Total expenses (4)	_____	1,741	2,635	1,379
(9) Ret.to cap. & fam.labor (8)minus(4)	_____	1,951	3,513	870
(10) Interest on farm inventory	_____	703	893	649
(11) Family labor earnings (9)minus (10)	_____	1,248	2,620	221
(12) Unpaid family labor	_____	241	175	308
(13) Oper.labor earnings (11) minus (12)	_____	1,007	2,445	-87

Summary of Farm Earnings (A)

Items	Your farm	Average of 81 farms	16 most profitable farms	16 least profitable farms
EXPENSES AND NET DECREASES				
Total power	$_____	$ 368	$ 470	$ 257
Hired	_____	42	69	23
Tractor	_____	48	78	16
Truck	_____	14	24	15
Auto (farm share)	_____	55	48	41
Gas engine (farm share)	_____	6	9	5
Elec. plant or current (farm share)	_____	7	10	6
Horses	_____	196	232	151
General machinery and equipment	_____	128	136	106
Buildings, fencing, tiling	_____	108	98	116
Productive livestock misc. expense	_____	14	15	18
Crop	_____	80	104	66
Real estate taxes	_____	157	194	144
Personal property tax	_____	23	29	23
Insurance	_____	24	28	18
General farm	_____	14	12	21
Hired labor & board, & unpaid family labor	_____	495	622	447
Interest on farm inventory	_____	703	893	649
(1) Total	_____	2,114	2,601	1,865
RETURNS AND NET INCREASES				
All productive livestock	_____	2,645	3,775	1,744
Cows	_____	1,028	1,421	757
Other cattle	_____	401	562	219
Hogs	_____	813	1,326	400
Sheep	_____	115	206	26
Poultry	_____	288	260	342
Crops, feed, vegetables and fuel	_____	238	827	-106
Agricultural Conservation payments	_____	131	168	100
Miscellaneous	_____	11	32	4
Income from work off the farm	_____	96	244	36
(2) Total	_____	3,121	5,046	1,778
Total expenses (1)	_____	2,114	2,601	1,865
(3) Oper. labor earnings (2) minus (1)	_____	1,007	2,445	-87

(A) Cash receipts and expenses are adjusted for changes in inventory for each enterprise and for each item of expense in order to show total receipts and net increases, and total expenses and net decreases. The operator's labor earnings are the same as those on page 8.

Analysis of the Reasons for Differences in Operator's Earnings

The financial statement on the preceding pages showsthat there is a wide range in earnings. The average operator's labor earnings for the sixteen most profitable farms was $2,445, and for the sixteen least profitable farms -$87. The difference between the averages for these two groups was $2,632. Some of the causes for these differences in earnings may be beyond the control of the farmer. It is significant, however, that the data secured from the records on these 81 farms indicate that there are several very definite factors that enable some farmers to make substantial earnings on these farms that are subject to rather serious erosion, while others fail to meet expenses. These factors and their relationship with earnings are the following:

Table 1. Relation of Dairy Production to Farm Earnings.

Lbs. butterfat per cow Group	Average	No. of Farms	Average Earnings
Below 150	119	23	$773
150 - 199	177	32	993
200 and above	240	25	1281

High production per cow tends to lower the cost of producing a pound of butterfat. This is very important on those farms on which butterfat sales are the major source of income.

Table 2. Relation of Returns Above Feed for Other Productive Livestock to Farm Earnings.

Returns above feed per animal unit of prod. livestock other than cows Group	Average	No. of Farms	Average Earnings
Below $20	$4	26	$762
$20 - 39	29	35	1081
40 and above	59	20	1129

These farms have, in addition to the dairy herd, quite an investment in other classes of productive livestock, as young cattle, hogs, sheep, or poultry. Most or all of the feed raised is fed, and considerable additional feed is purchased. Feed is the major item of cost in livestock production. High returns from livestock above the value of feed usually accompanies greater profits from the livestock. This means another addition to the farm earnings.

Table 3. Relation of Amount of Productive Livestock to Farm Earnings

Productive livestock units per 100 A. Group	Average	No. of Farms	Average Earnings
Below 11.5	11.8	23	$661
11.5 to 16.4	17.0	38	1176
16.5 and above	25.3	20	1084

On some farms the returns from livestock are so low that they do not cover feed and other costs. Such livestock is unprofitable, especially if there is more than enough to utilize what would otherwise be waste feed. This was especially true during the winter of 1936-1937, when feed prices were very high.

If the livestock is yielding a net return, an increased amount of livestock adds to size of business and the opportunity to increase the farm earnings. Livestock produces manure and aids in keeping up the fertility of the land, and utilizes waste products on the farm. Livestock also helps to provide productive employment throughout the year. Any method that aids in utilizing the available resources to full and efficient capacity should add to the farm income.

Table 4. Relation of Crop Yields to Farm Earnings.

Per cent crop yields were of the average for all the 81 farms Group	Average	No. of Farms	Average Earnings
Below 85	70	21	$570
85 - 114	100	39	871
115 and above	130	21	1698

High production per acre, up to certain limits, tends to lower the cost per bushel of grain or per ton of hay. Any possible method of management that will increase crop yields and therefore lower cost of production more than the extra expense incurred in securing the higher yields should be given consideration. As a rule, plowing under legumes and manure and control of erosion tend to increase crop yields on these farms.

Table 5. Relation of Choice of Crops to Farm Earnings.

Per cent of tillable land in high return crops* Group	Average	No. of Farms	Average Earnings
Below 30.0	25.9	25	$941
30.0 - 39.9	33.5	26	983
40.0 and above	48.5	30	1083

*Crops are marked on page 15 as (A), (B), (C), (D). All of acres in (A) crops, one-half of acres in (B) crops, and one-fourth of acres in (C) crops are used in calculating per cent of tillable land in high return crops.

As a rule, on these farms, such crops as alfalfa, sweet clover, red clover, corn, barley, winter wheat, and flax bring a higher net return per acre than other crops usually grown. Additions can be made to earnings by putting a greater percentage of the tillable land into these higher return crops.

Soil erosion and fertility maintenance are vital problems on the farms included in this study. Biennial and perennial legumes, especially alfalfa and sweet clover, form a sod that helps to check erosion, conserve humus and soil fertility. If properly inoculated they tend to increase the nitrogen content of the soil. Legume hays and pastures are also valuable for feed, for they lessen the necessity to purchase high-priced protein feeds. Alfalfa is undoubtedly the most profitable crop available for these farms.

Table 6. Relation of Size of Business (days of productive work) to Farm Earnings.

Days of productive work Group	Average	No. of Farms	Average Earnings
Below 400	328	24	$550
400 to 699	554	42	909
700 and above	897	15	2018

Average farm earnings tend to increase with an increase in size of business where size of business is measured by days of productive work. However, for those farmers who are operating their farms at a loss, the larger the volume of business the larger will be the loss. On the other hand, a farmer who is making a profit, could make a larger profit if he increased his size of business, providing that in so doing he does not lower materially the efficiency in some one or more important branches of his business. Those farmers who have large businesses usually have more flexibility of their organization than does the man with a small business, and can utilize more efficiently and to better advantage available labor, power, machinery and buildings.

Table 7. Relation of Amount of Work Accomplished per Worker to Farm Earnings.

Days of productive work per worker Group	Average	No. of Farms	Average Earnings
Below 250	201	25	$453
250 - 349	297	39	931
350 and above	458	17	1996

More days of productive work accomplished per worker reduce the labor charge per unit of business. Higher labor accomplishment can be secured in several ways. In the first place the business must be large enough so that there will be at least sufficient work available for the family labor. The farm should be so organized that the labor requirements are well distributed throughout the year. Handling pastures in an efficient manner, in such a way that as large a proportion as possible of the year's feed for livestock may be obtained from them, helps to reduce labor requirements. Proper planning of the farm work, economical use of labor saving machinery, etc., help to increase the work accomplished per worker.

Table 8. Relation of Power, Machinery and Building Expense to Farm Earnings.*

Expense per day of productive work Group	Average	No. of Farms	Average Earnings
$1.40 and above	$1.62	23	$691
.90 to 1.39	1.10	35	1006
Below .90	.69	23	1322

*Includes building, fencing, and all machinery expense, horse feed, and miscellaneous horse expense.

The expense factor shows a higher relation with earnings when prices are very low than when they are high. Some farms are under-equipped. On a few farms, excessive expenses constitute the main factor causing earnings to be very low. Some of the cash expenses can be kept down by careful management. Oftentimes necessary repairs and improvements can be made by using the available farm labor rather than by hiring extra help. Repairs and overhauling should be done before spring work begins insofar as possible; or on rainy days or in other spare time during the summer. Reducing the number of horses to the minimum required for efficient operation of the farm, helps reduce the power expense. In some cases farmers can offset some or all of the power and machinery expense by using their equipment for outside work.

Effect of Well Balanced Efficiency on Farm Profits

It is quite evident from this report that few farmers have a monopoly on efficiency. Quite often farm operators show efficient management in one part of the farm business, which is offset by poor results in other phases. These farmers get medium returns while those who fall down all along the line get the lowest returns, and on the other hand those few who can manage to attain high efficiency in all parts of their organization receive returns well above the average. This is well illustrated in Table 9.

Table 9. Relation of Operator's Labor Earnings to the Number of Factors in Which the Farmer Is Above the Average

No. of factors in which farm excels	No. of Farms	Your Farm	The length of the shaded lines are in proportion to the average operator's labor earnings	Average Operator's
Seven or eight	6	_____	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	$2339
Six	8	_____	xxxxxxxxxxxxxxxxxxxx	1542
Five	12	_____	xxxxxxxxxxxxxxxxx	1311
Four	21	_____	xxxxxxxxxxxxxx	1154
Three	13	_____	xxxxxxxxx	682
Two	15	_____	xxxxx	337
One or none	6	_____	xxx	220

The array in Table 9 indicates that it will be worth-while for each cooperator to study carefully his ranking on pages 13 and 14, and learn his standing in respect to each of the above factors and the elements of strength and weakness in his farm business.

Measures of Farm Organization and Management Efficiency

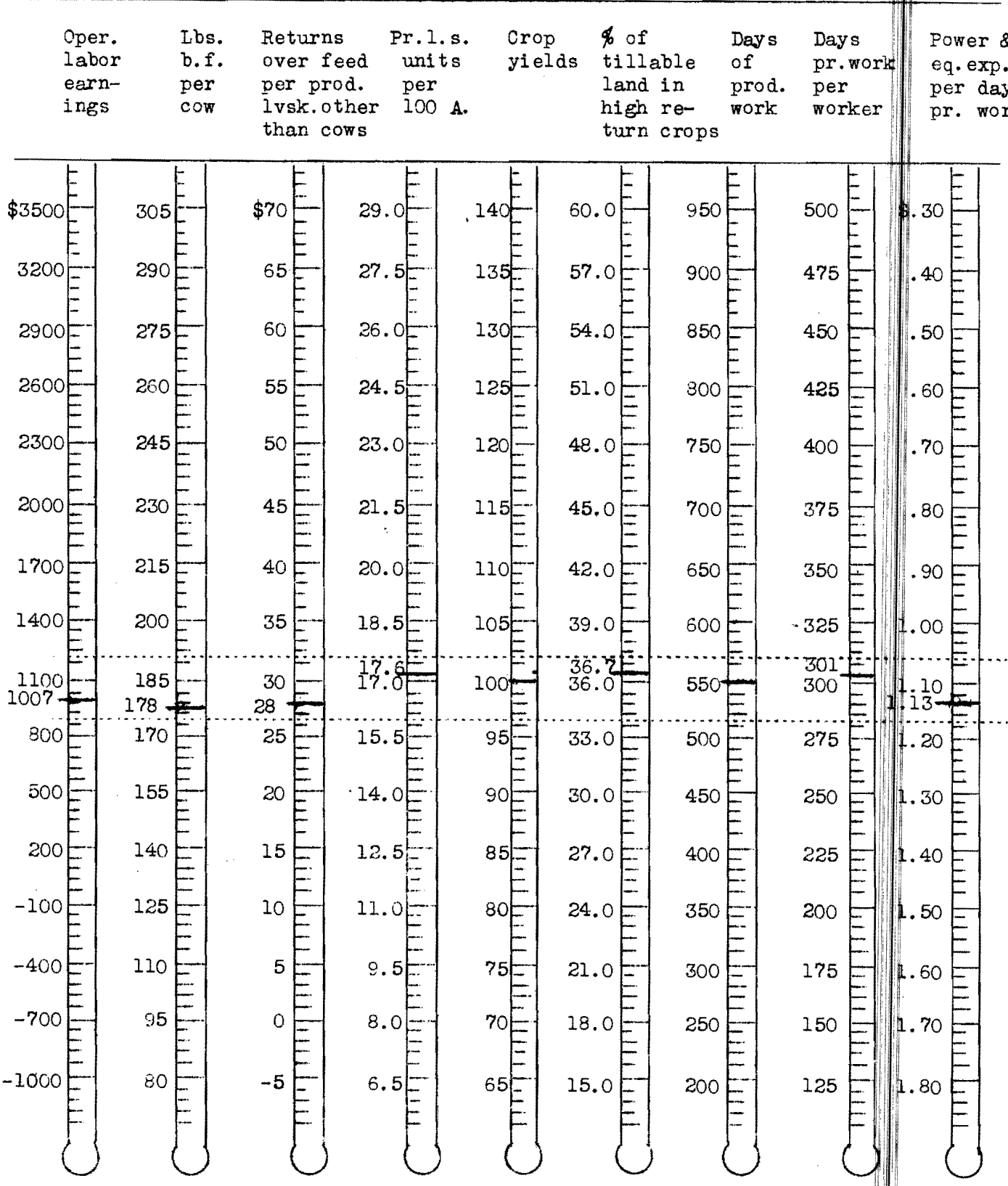
Measures used in chart on page 14.		Your Farm	Average of 81 farms	16 most profitable farms	16 least profitable farms
Operator's Labor Earnings	$		$1,007	$2,445	$ -87
(1) Pounds of butterfat per cow			178	184	146
(2) Return over feed(pr.lvst.other than cows)*	$		28	32	23
(3) Productive livestock units per 100 acres			17.6	16.5	14.2
(4) Crop yields**			100	103	77
(5) % of tillable land in high return crops***			36.7	37.7	34.9
(6) Size of business--days of productive work			550	769	413
(7) Days of productive work per worker			301	414	233
(8) Power and eq. exp. per day of prod. work	$		1.13	.95	1.23
Measures and items related to some of the above measures:					
(2) Return over feed per head other cattle	$		$4.01	$7.41	$1.55
Return over feed per 100 lbs.hogs prod.			2.33	2.71	2.88
Return over feed per hen			1.20	.67	.62
Return over feed per head sheep			2.20	3.30	1.05
(6) Days of productive work on crops			136	210	100
Days of productive work on prod.livestock			382	478	301
Days of other productive work			32	81	12
(7) Total number of workers			1.9	2.0	1.9
Number of family workers			1.5	1.4	1.5
Number of hired workers			.4	.6	.4
(8) Power expense per day of productive work	$		$.68	$.64	$.69
Mach. & equip. exp. per day of prod. work			.23	.18	.25
Bldg. & fencing exp. per day of prod. work			.22	.13	.29

*Given as returns over feed cost per animal unit of productive livestock other than cows.

**Given as a percentage of the average.

***Crops are marked on page 15 as (A), (B), (C), (D). All of the acres in (A) crops, one-half of acres in (B) crops, and one-fourth of acres in (C) crops are used in calculating per cent of tillable land in high return crops.

Using your figures from page 13, locate your standing with respect to the various measures of farm organization and management efficiency. The averages for 81 farms included in this summary are located between the two dotted lines across the center of this page.



Distribution of Acres in Farm

Crop (A) (B) (C) (D) refer to ranking used in calculating % of tillable land in High Return Crops (see page 11).		No. of farms growing this crop	Your Farm	Aver. of 81 farms	16 most profitable farms	16 least profitable farms
Winter wheat	(B)	15	_____	1.8	2.1	.0
Spring wheat	(C)	17	_____	1.7	1.2	3.9
Oats	(D)	48	_____	13.8	20.6	10.6
Barley	(B)	44	_____	9.9	23.4	8.3
Rye	(D)	4	_____	.5	.8	1.3
Flax	(B)	7	_____	1.7	4.5	.0
Wheat and oats	(C)	9	_____	2.6	6.6	.0
Oats and barley	(C)	31	_____	9.1	9.8	8.5
Miscellaneous	(C)	3	_____	.2	.4	.0
Total grain			_____	41.3	69.4	32.6
Corn, grain	(B)	69	_____	13.2	23.8	6.2
Corn, silage	(C)	64	_____	10.8	13.4	7.2
Corn, fodder	(D)	7	_____	1.1	3.2	1.6
Potatoes	(A)	31	_____	.7	.5	.7
Total cultivated crops			_____	25.8	40.9	15.7
Alfalfa	(A)	64	_____	14.2	21.6	10.8
Red clover	(B)	30	_____	4.4	4.0	6.6
Other legumes & mixtures	(C)	45	_____	8.8	9.9	10.5
Timothy	(D)	23	_____	2.5	2.2	1.1
Annual hay (millet, Sudan grass, sm. grain, etc.)	(D)	8	_____	.5	1.3	.1
Miscellaneous hays and seed crops	(C)	17	_____	3.0	6.2	1.3
Wild hay (non-tillable land)			_____	.2	.0	.0
Total hay			_____	33.6	45.2	30.4
Total crop acreage			_____	100.7	155.5	78.7
Sweet clover pasture	(B)		_____	1.5	3.9	.1
Alfalfa pasture	(A)		_____	.2	.3	.1
Red clover or rape pasture (hogs)	(B)		_____	.3	.0	.6
Miscellaneous legume pasture	(C)		_____	4.0	4.0	1.0
Other tillable pasture	(D)		_____	8.7	11.5	7.3
Non-tillable pasture			_____	40.0	32.3	57.4
Total pasture			_____	54.7	52.0	66.5
Tillable land not cropped			_____	2.8	2.2	3.0
Timber (not pastured)			_____	22.8	19.9	30.2
Roads and waste			_____	4.1	6.3	3.9
Farmstead			_____	4.8	6.5	3.6
Total acres in farm			_____	189.9	242.4	185.9
% of land tillable			_____	62.	75.	47.
% of tillable land in high return crops			_____	36.7	37.7	34.9

Yield of Crops

Yield of crops per acre	Your farm	Average 81 farms	16 most profitable farms	16 least profitable farms
Winter wheat, bu.	_____	17.4	17.4	-
Spring wheat, bu.	_____	10.3	13.1	5.3
Oats, bu.	_____	20.8	23.6	10.9
Barley, bu.	_____	18.1	21.5	9.9
Rye, bu.	_____	12.6	18.0	9.6
Flax, bu.	_____	3.8	4.2	-
Wheat and oats, bu.	_____	23.7	21.6	-
Oats and barley, bu.	_____	22.3	22.1	17.0
Corn, grain, bu.	_____	30.1	29.4	18.1
Corn, silage, tons	_____	5.7	5.5	4.3
Corn, fodder, tons	_____	1.8	1.3	1.6
Potatoes, bu.	_____	83.5	66.1	106.1
Alfalfa, tons	_____	1.8	1.9	1.9
Red clover, tons	_____	2.1	1.7	2.1
Clover and timothy, tons	_____	1.7	1.5	1.6
Timothy hay, tons	_____	1.3	1.1	1.8
Miscellaneous crops	_____	_____		
	_____	_____		

Summary of Amount of Livestock

Items	Your farm	Average 81 farms	16 most profitable farms	16 least profitable farms
No. of horses	_____	4.2	4.8	4.0
No. of colts	_____	.9	1.0	.8
No. of cows	_____	13.9	16.2	12.7
No. of cows per worker	_____	7.6	8.4	7.0
Head of other cattle	_____	17.2	21.1	9.7
Litters of pigs raised	_____	7.6	10.1	3.9
Pounds of hogs produced	_____	8404	15030	4608
Head of sheep (2 lambs equal 1 head)	_____	23.7	39.5	7.3
No. of hens	_____	78.9	109.6	99.5
Total no. of prod. livestock animal units	_____	31.2	39.8	22.8
% of tot. prod. lvst. units that are cows	_____	48.2	43.9	57.1
% of tot. prod. lvst. units that are other cattle	_____	27.6	28.2	22.5
% of tot. prod. lvst. units that are hogs	_____	12.8	14.5	12.1
% of tot. prod. lvst. units that are sheep	_____	7.2	10.2	4.0
% of tot. prod. lvst. units that are hens	_____	4.2	3.2	4.3

Factors of Cost and Return in Dairy Production

Items	Your Farm	Average 81 farms	16 farms highest in B.F. per cow	16 farms lowest in B.F. per cow
COWS				
Pounds of butterfat per cow	_____	178	258	107
Feeds per cow, lbs.:				
Corn	_____	77	99	47
Small grain	_____	350	479	168
Com. feeds - under 25% protein	_____	35	53	34
Com. feeds - over 25% protein	_____	8	15	4
Tame hay	_____	1601	1463	1359
Alfalfa	_____	2448	3302	1851
Wild hay	_____	60	0	99
Corn fodder	_____	241	419	194
Silage	_____	6086	8359	4456
Total concentrates	_____	470	646	253
Total dry roughage	_____	4350	5184	3503
Feed cost per cow:				
Concentrates	$_____	$ 6.27	$ 8.51	$ 4.33
Roughages	_____	25.63	32.03	19.25
Pasture	_____	5.63	6.13	5.48
TOTAL FEED COSTS	$_____	$37.53	$46.67	$29.06
TOTAL VALUE OF PRODUCT	$_____	$74.59	$99.70	$49.19
RETURNS ABOVE FEED COST PER COW	$_____	$37.06	$53.03	$20.13
Price received per lb. B.F. sold:				
As manufacturing cream	$_____	$ .31	$ .30	$ .29
Feed cost per lb. B.F.	_____	.21	.18	.27
Number of cows	_____	13.9	11.8	14.4
YOUNG CATTLE				
Feeds used per head, lbs.:				
Concentrates	_____	132	243	53
Hay and fodder	_____	1979	1966	1725
Silage	_____	2840	2421	1773
Whole milk	_____	473	315	540
Skimmilk	_____	1107	1119	984
Feed cost per head:				
Concentrates	$_____	$ 2.02	$ 3.49	$ .75
Roughages	_____	10.92	10.16	9.41
Milk	_____	8.36	6.89	10.14
Pasture	_____	2.62	2.26	2.35
TOTAL	$_____	$23.92	$22.80	$22.65
RETURNS PER HEAD	$_____	$26.80	$26.55	$24.20
RETURNS ABOVE FEED COST PER HEAD	$_____	$ 2.88	$ 3.75	$ 1.55
Number of head of young cattle	_____	17.2	21.1	9.7

Feed Costs and Returns for Hogs

Items	Your farm	Average 80 farms	16 farms highest in returns above feed	16 farms lowest in returns above feed
Lbs. of feed per 100 lbs. hogs produced:				
Corn	_____	237	162	293
Small grain	_____	170	98	231
Commercial grain feeds	_____	15	8	35
Total grain and commercial feeds	_____	422	268	559
Tankage	_____	18	19	14
Skimmilk	_____	370	315	478
Cost of feed per 100 lbs. hogs produced:				
Grain and commercial feeds	$_____	$5.76	$3.65	$7.46
Tankage and skimmilk	_____	.72	.60	.92
Pasture	_____	.21	.14	.26
Total Feed Cost per 100 lbs. Hogs Prod.	$_____	$6.69	$4.39	$8.64
RETURNS PER 100 LBS. HOGS PRODUCED	$_____	$9.00	$9.80	$7.13
RET. ABOVE FEED COST PER 100# HOGS PROD.	$_____	$2.31	$5.41	- $1.51
Price received per 100# hogs sold	$_____	$9.22	$9.99	$8.66
Total no. of litters	_____	7.7	5.1	6.3
Total no. of pigs weaned per litter	_____	5.6	5.6	5.3
Pounds of hogs produced	_____	9048	6516	7766

Feed Costs and Returns for Poultry

Items	Your farm	Average 81 farms	16 farms highest in returns above feed per hen	16 farms lowest in returns above feed per hen
Lbs. of feed per hen:				
Concentrates	_____	95	121	143
Skimmilk	_____	46	50	73
Cost of feed per hen:				
Concentrates	$_____	$1.46	$1.80	$2.18
Skimmilk	_____	.08	.09	.12
TOTAL	$_____	$1.54	$1.89	$2.30
Value of product per hen	$_____	$2.32	$5.12	$1.33
RETURNS ABOVE FEED COST PER HEN	$_____	$ .78	$3.23	- $.97
Price received per doz. eggs sold (cents)	_____	18.	19.	15.
Eggs laid per hen	_____	102.	158.	84.
No. of hens	_____	79.	72.	88.

Feed Costs and Returns For Sheep

Items	Your farm	Average of 34 farms	7 farms highest in returns above feed	7 farms lowest in returns above feed
Feeds used per head,* lbs.:				
Concentrates	_____	53	107	49
Tame hay	_____	136	187	125
Alfalfa	_____	153	24	139
Corn fodder and wild hay	_____	59	78	0
Silage	_____	100	41	220
Feed cost per head:				
Concentrates	$_____	$.67	$1.39	$.67
Roughages	_____	1.36	.88	1.40
Pasture	_____	.80	.99	.77
TOTAL	$_____	$2.83	$3.26	$2.84
Value of production per head:	$_____	$5.10	$10.35	- $.28
RETURNS ABOVE FEED COST PER HEAD	$_____	$2.27	$7.09	- $3.12
Number of head of sheep*	_____	53	31	19

*Two lambs under six-months' old considered as one head.

Feed Costs per Horse and Other Power Expense Items

Farms with tractors	Your farm	Average of 81 farms	16 most profitable farms	16 least profitable farms
Feed per horse,* lbs.:				
Grain	_____	1433	1618	1130
Tame hay and alfalfa	_____	4891	4973	4460
Wild hay and fodder	_____	1719	123	563
Feed costs per horse:				
Grain	$_____	$17.70	$20.19	$15.03
Roughage	_____	19.97	18.82	20.82
Pasture	_____	3.01	2.90	3.15
TOTAL	$_____	$40.69	$41.91	$39.00
Number of work horses	_____	4.2	4.8	4.0
Number of colts	_____	.9	1.0	.8
Total acres in farm	_____	190	242	186
Crop acres per horse	_____	25	34	20
Tractor and horse exp. per crop acre	$_____	$2.74	$2.04	$2.72
Farm power exp. per day prod. work	_____	.68	.64	.69

*Two colts equal one horse.

Distribution of Farm Produce Used in House

	Quantities		Values	
	Your farm	Average 81 farms	Your farm	Average 81 farms
Whole milk	_____qts.	1003 qts.	$_____	$35.34
Skimmilk	_____qts.	94 qts.	_____	.35
Cream	_____pts.	416 pts.	_____	47.04
Farm-made butter	_____lbs.	41 lbs.	_____	13.39
Eggs	_____doz.	161 doz.	_____	33.63
Poultry	_____head	32 head	_____	16.25
Cattle	_____lbs.	266 lbs.	_____	14.98
Hogs	_____lbs.	571 lbs.	_____	52.86
Sheep	_____lbs.	6 lbs.	_____	.51
Potatoes	_____bu.	31 bu.	_____	25.70
Vegetables and fruit	_____	-	_____	56.32
Farm fuel	_____cds.	28 cds.	_____	64.33
Total			$_____	$360.70

	Your farm	Average 81 farms
Average value of farm dwelling	$_____	$1966
Interest and depreciation on farm dwelling	_____	157

Distribution of Household and Personal Expenses for Those Farms Which Kept Complete Accounts of These Expenses 1936

	Your farm	Average 68 farms	14 most profitable	14 least profitable
Number of persons, adult equivalent)Family	_____	4.0	6.2	3.8
)Other*	_____	.5	1.2	.3
Food	$_____	$214.74	$205.40	$193.77
Operating and supplies	_____	53.70	61.13	30.82
Furnishings and equipment	_____	61.48	47.54	33.31
Clothing and materials	_____	103.43	109.02	77.69
Health	_____	49.96	59.48	37.03
Development and recreation	_____	66.11	69.98	43.31
Personal	_____	32.84	25.64	22.85
Life insurance and savings	_____	56.54	77.34	11.00
Personal share of auto expense	_____	88.46	147.37	46.11
Housing	_____	30.98	25.45	45.89
Total Household & Personal Cash Expense	$_____	$758.24	$828.35	$547.78
Food furnished by the farm	$_____	$296.12	$348.87	$234.14
Fuel furnished by the farm	_____	66.33	56.50	66.50
Interest & deprec. on farm dwelling	_____	151.14	147.57	142.89
Interest & deprec. on misc. items**	_____	29.64	28.35	18.13
Total Household & Personal Expense	$_____	$1301.47	$1409.64	$1009.44

* Hired help or others boarded.

**Personal share of auto, gas engine, and electric plant, and household goods.

Summary of Farm Earnings

Items	Deer-Bear Creek Area	Beaver Creek Area	Gilmore Creek Area
Number of farms	32	35	14
CASH EXPENSES			
Tractor (new & exp.)	$ 161	$ 113	$ 25
Truck (new & exp.)	25	52	53
Auto (new & exp.) (farm share)	128	73	71
Gas engine (new & exp.) (farm share)	9	2	6
Electricity (new & exp.) (farm share)	8	9	10
Machinery and equipment (new)	214	94	79
Machinery and equipment (exp.)	43	32	30
Buildings, fences, tiling (new)	62	151	36
Buildings, fences, tiling (exp.)	56	29	23
Hired labor	256	100	128
Feed for livestock	297	166	470
Other expense for livestock	34	24	39
Horses bought	55	35	27
Cows bought	33	24	88
Other cattle bought	155	26	16
Hogs bought	75	41	20
Sheep bought	106	4	0
Poultry bought	25	21	63
Crop (seed, twine, spray)	144	97	54
Taxes and insurance	227	189	186
General farm	13	21	28
(1) Total cash expense	2126	1303	1452
(2) Decrease in farm inventory	-	-	101
(3) Board for hired labor	125	63	58
(4) Total expense (sum of (1),(2),& (3)	2251	1366	1611
CASH RECEIPTS			
Horses	30	28	4
Cows	161	91	111
Dairy products	705	802	1080
Other cattle	353	228	116
Hogs	840	988	249
Sheep	362	38	0
Poultry	85	93	395
Eggs	172	99	145
Small grain	294	91	157
Corn	15	6	1
Hay	23	11	9
Root crops	3	5	120
Other crops	83	51	41
Miscellaneous	179	86	40
Income from work off the farm	141	53	21
Agricultural Conservation payments	162	104	128
(5) Total cash receipts	3608	2774	2617
(6) Increase in farm inventory	612	67	-
(7) Farm produce used in house	354	371	350
(8) Total receipts (sum of (5) & (6)	4574	3212	2967
Total expenses (4)	2251	1366	1611
(9) Ret.to cap.& fam.labor (8)minus(4)	2323	1846	1356
(10) Interest on farm inventory	737	685	665
(11) Family labor earnings (9)minus(10)	1586	1161	691
(12) Unpaid family labor	124	301	355
(13) Oper.labor earnings (11) minus(12)	1462	860	336

Distribution of Acres in Farm and Average Yields per Acre

	Distribution of Acres			Crop Yields		
	Deer-Bear Creek Area	Beaver Creek Area	Gilmore Creek Area	Deer-Bear Creek Area	Beaver Creek Area	Gilmore Creek Area
Winter wheat	3.3A.	.2A.	2.0A.	16.5 bu.	19.0 bu.	19.8 bu.
Spring wheat	2.3	.7	3.0	10.2 "	15.7 "	4.8 "
Oats	17.8	10.4	13.3	22.0 "	23.5 "	15.2 "
Barley	14.8	4.0	13.4	17.3 "	26.2 "	9.3 "
Rye	.6	.0	1.4	15.6 "	-	9.6 "
Flax	4.2	.0	.0	3.8 "	-	
Oats and wheat	2.6	3.6	.0	20.1 "	28.1 "	
Oats and barley	9.7	12.2	.0	23.3 "	21.6 "	
Miscellaneous	.6	.0	.0	-	-	
Total grain	55.9	31.1	33.1			
Corn, grain	16.1	14.0	4.9	27.1 bu.	35.4 bu.	18.8 bu.
Corn, silage	15.6	7.8	7.0	4.5 tons	4.7 tons	4.2 tons
Corn, fodder	1.9	.0	2.2	2.3 "	-	1.5 "
Potatoes	.3	.2	2.8	58.4 bu.	69.6 bu.	110.5 bu.
Total cultivated crops	33.9	22.0	16.9			
Alfalfa	17.6	10.2	16.7	1.7 tons	2.0 tons	1.6 tons
Clover	2.6	4.4	8.5	1.9 "	2.2 "	2.1 "
Other legumes & mixtures	9.4	7.9	10.0	1.6 "	1.7 "	1.6 "
Timothy	4.2	1.4	1.4	1.1 "	1.6 "	1.7 "
Annual hay	1.1	.0	.2	.7 "	-	.9 "
Misc. seed crops	6.8	.3	.6	-	-	-
Wild hay (non-tillable)		.5				
Total hay and seed	41.7	24.7	37.4			
Total crop acreage	131.5	77.8	87.4			
Sweet clover pasture	3.4	.3	.0			
Alfalfa pasture	.5	.1	.1			
Red clover or rape pasture	.0	.4	.6			
Misc. legume pasture	5.9	3.6	.6			
Other tillable pasture	16.3	2.5	6.5			
Non-tillable pasture	26.9	44.4	58.6			
Total pasture	53.0	51.3	66.4			
Tillable land not cropped	4.5	.9	4.0			
Timber & brush (not pastured)	15.6	18.9	49.4			
Roads and waste	4.7	3.6	4.0			
Farmstead	6.5	3.7	3.8			
Total acres in farm	215.8	156.2	215.0			
Per cent of land tillable	77	54	45			

Measures of Farm Organization and Management Efficiency	Deer-Bear Creek Area	Beaver Creek Area	Gilmore Creek Area
Operator's labor earnings	$1462	$860	$336
Pounds of butterfat per cow	197	166	151
Returns over feed (prod. livestock other than cows)	$28	$24	$34
Productive livestock units per 100 acres	17.0	19.9	13.0
Crop yields	100	103	82
Per cent of tillable land in high return crops	33.3	37.2	43.5
Size of business - days of productive work	603	530	481
Days of productive work per worker	356	273	248
Power, machinery and building expense per day of productive work	$1.13	$1.14	$1.11
Returns over feed per head other cattle	$4.68	$4.35	$1.63
Returns over feed per 100 lbs. hogs produced	2.47	1.72	3.46
Returns over feed per hen	.57	.22	.80
Returns over feed per head sheep	1.45	.81	-

Amount of Livestock			
No. of horses	4.6	3.8	4.0
No. of colts	1.1	.7	1.2
No. of cows	11.9	14.7	16.1
No. of cows per worker	7.3	7.6	8.3
Head of other cattle	21.0	16.5	10.1
Litters of pigs raised	7.6	9.5	2.7
Pounds of hogs produced	9877.0	9128.0	3230.0
Head of sheep	53.6	5.8	.0
No. of hens	97.5	133.7	113.6
Total number of productive livestock animal units	35.4	30.0	24.4
% of total prod. livestock units that were cows	38.4	49.9	66.4
% of total prod. livestock units that were other cattle	30.1	27.4	22.3
% of total prod. livestock units that were hogs	12.6	15.4	6.6
% of total prod. livestock units that were sheep	15.3	2.7	.0
% of total prod. livestock units that were hens	3.6	4.6	4.7

Soil Conservation and the Farm Organization

It is usually held that livestock farming results in improving the fervility of the farm because most of the crops which are raised on the farm are returned to the fields in the form of manure. However, unless a farmer uses considerable amounts of purchased feeds in addition to those raised on the farm, he will usually have a total aggregate loss of about 15 to 25 per cent of the phosphoric acid and potash removed by the crops he grows on his farm. The extent of such losses will vary according to the type of farming carried on and the different practices carried out.

In addition to the losses of fertility through the feeding of crops and the handling of manure, there are, through erosion, equal or even more serious losses, not only of soil fertility but of the soil itself. Generalization of a careful study of the three areas included in this report can be made to the extent that from 2 to 6 inches of the top soil has been lost by erosion since the fields were first broken. In some instances the entire top soil has actually been removed by erosion and the crops are being grown on the much less productive sub-soil. This loss is much more serious than the loss of fertility alone, because fertility can be replaced within a relatively few years by proper cropping systems and the addition of some of the more important plant food elements which have been removed by the growth of crops. But when we lose the surface soil, we lose not only the fertility but also the organic matter, which affects the water holding capacity and the tilth. When these are lost they must be replaced before the fertility of the soils can be restored.

It has been estimated that with a loss of the first 4 inches of the top soil of Clinton silt loam (and at least one-half of the soils in the areas studied are Clinton silt loam) there has been an accompanying loss of one-fourth to one-half of the original amount of phosphorus of the top soil. Also a considerable portion of the potash and most of the humus and organic matter of the land are lost when the upper 4 inches of the top soil are washed away. When humus and organic matter are washed away, there is a serious loss of nitrogen and a general lowering of yields of most crops.

Consideration of these serious losses draws attention to the necessity of better farm management practices and erosion control measures to combat and reduce such serious losses. Introduction of erosion control practices and devices into any farm organization will necessitate careful consideration on the part of the farmer who owns and operates the land and on the part of any cooperating agency that helps to inaugurate such plans. Careful review of the data contained in this report will give some insight as to those farm organizations and as to those farm practices proving most profitable in the three areas represented.