UNIVERSITY OF MINNESOTA
Department of Agriculture
and the
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Cooperating

FARM BUSINESS ANALYSIS SURVEY
OF 44 FARMS IN THE
CLEAR LAKE SOIL CONSERVATION DEMONSTRATION AREA
1941

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FARM BUSINESS ANALYSIS SURVEY OF 44 FARMS IN THE CLEAR LAKE SOIL CONSERVATION DEMONSTRATION AREA SHERBURNE COUNTY, MINNESOTA[1]

1941

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INTRODUCTION

Purpose of Study

During the fall of 1941 the Federal Government through the Soil Conservation Service established a soil conservation demonstration project in the Clear Lake Area of Sherburne County. Technical assistance was made available to farmers in establishing wind, water, and soil erosion control demonstrations on their farms.

Data contained in this report were obtained for the use of farm operators and for planning farms for soil conservation. Good planning for soil conservation considers both the physical and economic aspects of the problems involved.

Source of Data[3]

This report is based upon a survey made of 44 of the 68 farms operated in the demonstration area and covers the period April 1, 1941 to April 1, 1942. Included in the survey was a record of inventories, farm expenses and receipts, farm produce used in the house, unpaid family labor, crop acreages and production, and livestock numbers and production. Information was also obtained on the wind erosion problem and the effectiveness of control measures practiced by the farmers.

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[1] The Department of Agricultural Economics, University of Minnesota and the Soil Conservation Service, United States Department of Agriculture, cooperated in this study.

[2] Project Supervisor, Economic Research, Soil Conservation Service. The author wishes to acknowledge with appreciation the help of George A. Pond in conducting this study.

[3] Gardiner A. Graham of the Soil Conservation Service, and Frank Miller and G. E. Toben of the Division of Agricultural Economics, University of Minnesota assisted in taking the surveys.

Description of Area

The project area consists of approximately 23,000 acres located in parts of Clear Lake, Haven and Palmer townships in Sherburne County. The southern two-thirds of the area along the Mississippi River is a sand plain that extends back to the gently undulating area north of the Elk River. The soil is characterized by a very dark greyish loamy sand to sandy loam from 6 to 12 inches in thickness and underlain with sand or mixed sand and gravel . The depressions in the northern part of the area often have a peaty surface and are frequently underlain with marl. The level, open cropland provides little protection from the sweeping effects of the wind. Drifted sand along fence rows and other barriers are visible evidence of wind erosion.

The annual precipitation in the area is approximately 27 inches of which 65 per cent occurs between April 1 and September 1. Precipitation during the period April 1, 1941, to April 1, 1942 was 5½ inches more than the 65-year average. Temperatures were also above normal. The last killing frost was May 10 and the first killing frost was September 28, giving a frost-free period of 141 days which is average for the area. The prevailing wind is from the northwest, although south winds are frequent during the summer and fall.

Table 1.--Monthly and Annual Precipitation and Temperature, St. Cloud April 1, 1941 to April 1, 1942.

		Precipitation		Temperature	
		Monthly and total	Departure from normal	Monthly and annual means	Departure from normal
		Inches	Inches	Degrees	Degrees
1941	April	2.08	+0.20	49.8	+5.5
	May	5.23	+1.84	60.4	+4.1
	June	6.19	+1.81	66.4	+0.7
	July	1.23	-2.33	71.9	+0.7
	August	5.83	+2.47	68.4	+0.2
	September	5.02	+1.60	59.8	+0.4
	October	3.28	+1.08	47.2	-1.5
	November	0.01	-1.20	32.6	+2.4
	December	0.86	+0.32	21.4	+4.6
1942	January	0.02	-0.70	18.6	+8.8
	February	0.26	-0.40	16.8	+3.4
	March	1.94	+0.85	33.6	+6.2
	Annual	31.95	+5.54	45.6	+3.0

Numerous county aid and state aid roads provide easy access to all weather state highways over which farm produce are hauled to markets in St. Cloud, St. Paul, Minneapolis, and South St. Paul. The area is also served by the Northern Pacific Railroad.

Comparisons are made in the following sections of the report between "Your Farm" and the average of the 44 farms included in the study, the nine most profitable farms, and the nine least profitable farms. From these comparisons each farm operator can determine the strong and weak points in his farm organization. A study of these data may suggest opportunities for improving the farm business and earnings.

Data contained in this report are on the whole farm basis without regard to tenure, i.e., the information is presented as if each farm were owned by its operator. Expenses of the landlord such as real estate taxes, building repair, insurance, etc., are estimates obtained from the tenant.

Table 2.--Distribution of Farm Inventories (Beginning of Year), 1941

Items	Your farm	Average 44 farms	9 most profitable farms	9 least profitable farms
Size of farm (acres)	_____	364	708	190
Size of business (work units)[1]	_____	524	865	341
Horses	_____	$288	$441	$187
Productive livestock (total)	_____	1620	2474	813
Dairy and dual purpose cows	_____	806	1238	465
Other dairy and dual purpose cattle	_____	318	550	168
Beef cattle (including feeders)	_____	181	222	0
Hogs	_____	189	342	111
Sheep	_____	46	52	0
Poultry (including turkeys)	_____	80	70	69
Crop, seeds, and feed	_____	446	962	145
Machinery and equipment (total)	_____	1638	3252	807
Power machinery (farm share)	_____	717	1271	403
Crop and general machinery	_____	842	1849	372
Livestock equipment and supplies	_____	79	132	32
Buildings, fences, etc.	_____	4036	6427	2514
Land	_____	3747	6062	2016
Total farm capital	_____	11775	19618	6482

[1] The total "work units" for any one farm is a measure of size of farm business and accounts for both the amount of livestock and the acres of crops. It is the accomplishment of a farm worker in a ten-hour day working on crops and productive livestock at average efficiency.

The number of work units for each animal and each acre of crops used in this report are listed as follows:

Item	Per	No. of work units	Item	Per	No. of work units
Dairy and dual purpose cows	cow	14.0	Small grain	acre	0.8
			Soybeans for grain	"	1.0
Other dairy & dual purpose cattle	animal unit*	4.0	Sweet corn	"	2.5
			Corn, grain	"	1.8
Beef breeding herd		4.0	Corn, silage	"	2.1
Sheep - farm flock		1.6	Corn, fodder	"	1.5
Hens	100 hens	28.0	Alfalfa hay	"	1.0
Feeder cattle	head	2.5	Soybean hay	"	1.4
Hogs	cwt. produced	.3	Other hay crops	"	.6
Turkeys		.7	Canning peas	"	2.0

* Animal unit represents one cow, one bull, one feeder steer or heifer, two head of other cattle, seven head of sheep, fourteen lambs, five hogs, ten pigs, 100 hens, or 1,400 lbs. turkeys produced.

Table 2.--(continued) Distribution of Farm Inventories (End of Year), 1941

Item	Your farm	Average 44 farms	9 most profitable farms	9 least profitable farms
Horses	_____	$293	$449	$194
Productive livestock (total)	_____	2436	4244	1072
Dairy and dual purpose cows	_____	911	1541	445
Other dairy & dual purpose cattle	_____	502	777	301
Beef cattle (including feeders)	_____	300	569	0
Hogs	_____	559	1125	239
Sheep	_____	55	116	0
Poultry (including turkeys)	_____	109	116	87
Crop, seeds, and feed	_____	600	1266	178
Machinery and equipment (total)	_____	1775	3394	778
Power machinery (farm share)	_____	772	1302	352
Crop and general machinery	_____	919	1918	397
Livestock equipment and supplies	_____	84	174	29
Buildings, fences, etc.	_____	3989	6219	2567
Land	_____	3747	6062	2016
Total farm capital	_____	12840	21634	6805
Increase in farm capital during year	_____	1065	2016	323

Table 3.--Distribution of Acres in Farms, 1941

Crop	Number growing this crop	Your farm	Average of 44 farms	9 most profitable farms	9 least profitable farms
Wheat	25	_____	4.9	7.9	2.2
Oats	41	_____	30.5	54.7	18.9
Barley	3	_____	.7	2.4	0
Rye	41	_____	65.2	144.9	26.8
Canning peas	2	_____	.5	0	0
Soybeans	4	_____	1.9	6.9	0
Miscellaneous grains*	5	_____	1.2	3.0	1.3
TOTAL SMALL GRAIN AND PEAS		_____	104.9	219.8	49.2
Corn, grain	34	_____	36.5	68.1	27.3
Corn, silage	33	_____	10.0	13.5	4.9
Corn, fodder	26	_____	21.6	25.5	17.7
Sweet corn	2	_____	.2	1.1	0
Potatoes and truck crops	33	_____	.9	1.4	1.1
TOTAL CULTIVATED CROPS		_____	69.2	109.6	51.0
Alfalfa	35	_____	17.9	33.2	4.8
Red clover	3	_____	.6	1.8	0
Miscellaneous legumes	8	_____	1.9	4.2	0
Timothy	17	_____	6.2	14.2	.5
Annual hays	11	_____	2.8	4.2	5.4
Wild hay - tillable	9	_____	3.4	9.6	.7
TOTAL TILLABLE LAND IN HAY		_____	32.8	67.2	11.4
Alfalfa & alfalfa brome pasture	3	_____	1.0	.7	0
Miscellaneous legume pasture	2	_____	.4	0	1.5
Other tillable pasture	21	_____	11.6	31.3	3.7
TOTAL TILLABLE LAND IN PASTURE		_____	13.0	32.0	5.2
Tillable land not cropped	31	_____	21.8	55.1	11.7
TOTAL TILLABLE LAND		_____	241.7	483.7	128.5
Phalaris hay (non-tillable)	2	_____	.3	.9	0
Wild hay (non-tillable)	17	_____	6.4	.5	10.6
Non-tillable pasture	44	_____	91.5	186.1	41.3
Timber not pastured	5	_____	1.7	1.2	0
Roads and waste		_____	16.2	24.1	5.7
Farmstead		_____	6.2	11.9	3.9
TOTAL ACRES IN FARM		_____	364.0	708.4	190.0

* Includes flax, millet, oats and barley, and oats and wheat.

Table 4.--Crop Yields per Acre, 1941

		Your farm	Average 44 farms	9 most profitable farms	9 least profitable farms
Wheat	bu.	_____	11.7	12.1	12.4
Oats	bu.	_____	22.3	23.0	16.2
Rye	bu.	_____	10.3	10.2	7.8
Corn, grain	bu.	_____	26.5	26.6	22.2
Corn, silage	tons	_____	6.0	6.1	6.1
Corn, fodder	tons	_____	1.5	1.7	1.9
Potatoes	bu.	_____	54.6	35.2	26.3
Alfalfa hay	tons	_____	1.5	1.6	1.1
Soybean hay	ton	_____	.9	-	-
Millet hay	ton	_____	1.1	-	-
Wild hay (tillable)	ton	_____	1.2	-	-
Wild hay (non-tillable)	ton	_____	1.1	-	.9
INDEX - CROP YIELDS		_____	100.0	100.2	89.5

Table 5.--Percentage Distribution of Use of Land per Farm, 1941

Land Use	Your farm	Average 44 farms	9 most profitable farms	9 least profitable farms
		Percentage of Farm		
Small grain and peas	_____	28.8	31.0	25.9
Cultivated crops	_____	19.0	15.5	26.8
Hay (tillable)	_____	9.0	9.5	6.0
Pasture (tillable)	_____	3.6	4.5	2.7
Tillable land not cropped	_____	6.0	7.8	6.2
Total tillable land	_____	66.4	68.3	67.6
Hay (non-tillable)	_____	1.8	.2	5.6
Pasture (non-tillable)	_____	25.1	26.3	21.7
Timber not pastured	_____	.5	.1	.0
Buildings, roads and waste	_____	6.2	5.1	5.1
TOTAL	100.0	100.0	100.0	100.0

Table 6.--Livestock Numbers, Production and Gross Returns,* 1941

	Your farm	Average 44 farms	9 most profitable farms	9 least profitable farms
DAIRY CATTLE				
Number of farms reporting dairy cattle		25	4	8
Gross returns per dairy cow	_____	$101.53	$144.85	$63.97
Pounds of butterfat per dairy cow	_____	191	180	144
Number of head of dairy cows	_____	11.6	17.1	8.0
Gross returns per head other dairy cattle	_____	$ 31.07	$ 29.98	$24.06
Gross returns per animal unit all dairy cattle	_____	$ 86.67	$120.50	$58.67
Number of animal units all dairy cattle	_____	16.9	24.5	12.0
DUAL PURPOSE CATTLE				
Number of farms reporting dual purpose cattle		17	5	1
Gross returns per dual purpose cow	_____	$ 80.40	$100.67	$43.25
Pounds of butterfat per dual purpose cow	_____	153	187	101
Number of head of dual purpose cows	_____	13.1	17.7	8.5
Gross returns per head other dual purpose cattle	_____	$ 29.77	$ 38.83	$10.00
Gross returns per A. U. all dual purpose cattle	_____	$ 71.66	$ 93.37	$35.98
Number animal units all dual purpose cattle	_____	20.9	29.2	12.3
PRICE RECEIVED PER POUND OF BUTTERFAT SOLD AS				
Manufacturing cream (cents) 41 farms	_____	37.8	37.9	37.8
Wholesale cream or milk (cents) 3 farms	_____	40.4	39.7	-
BEEF BREEDING CATTLE				
Number of farms reporting beef breeding herds		3	1	0
Gross returns per A. U. of beef breeding cattle	_____	$ 70.91	$ 98.18	-
Number of A. U. of beef cows and bulls per herd	_____	18.8	28.5	-
FEEDER CATTLE				
Number of farms reporting feeder cattle		15	3	0
Gross returns per head feeder cattle	_____	$ 93.91	$128.66	-
Number of head of feeder cattle	_____	5.8	8.7	-
SHEEP - FARM FLOCK				
Number of farms reporting sheep		8	3	0
Gross returns per head** of sheep	_____	$ 9.64	$ 10.33	-
Number of head of sheep	_____	29.9	23.8	-
HOGS				
Number of farms reporting hogs		43	9	9
Gross returns per cwt. of hog produced	_____	$ 11.46	$ 11.87	$11.54
Pounds of hog produced	_____	11,328	21,684	5,486
Price received per cwt. of hogs sold	_____	$ 10.22	$ 10.64	$ 9.95
CHICKENS				
Number of farms reporting chickens		42	7	9
Gross returns per hen	_____	$ 2.56	$ 2.92	$ 2.57
Number of hens	_____	134	165	116
Eggs laid per hen	_____	96	94	110
Price received per dozen eggs sold (cents)	_____	21.7	20.5	19.7

*Gross returns is the net increase or decrease in the value of animal plus returns from products sold if any.

**Two lambs under 6 months of age considered as one head.

Table 7.--Family Living Furnished by the Farm, 1941

		Your farm	Average of 44 farms	9 most profitable farms	9 least profitable farms
Quantities					
Whole milk	qts.	_____	629	527	718
Skimmilk	qts.	_____	33	0	0
Cream	pts.	_____	319	294	279
Butter	lbs.	_____	9	0	11
Eggs	doz.	_____	193	183	201
Poultry	head	_____	48	33	40
Cattle	lbs.	_____	126	133	44
Hogs	lbs.	_____	574	836	523
Sheep	lbs.	_____	6	0	0
Farm fuel	cds.	_____	8	10	1
Values					
Whole milk		_____	$21.64	$19.32	$22.43
Skimmilk		_____	.13	0	0
Cream		_____	33.77	32.05	28.80
Butter		_____	3.75	0	4.45
Eggs		_____	42.16	38.53	42.30
Poultry		_____	33.42	20.34	52.36
Cattle		_____	13.18	18.89	6.11
Hogs		_____	61.97	82.50	46.71
Sheep		_____	.39	0	0
Vegetables and fruit		_____	35.07	28.33	35.00
Farm fuel		_____	37.50	48.33	7.22
Rental value of house*		_____	154.05	218.99	111.80
Total		_____	437.03	507.28	357.18

* Computed at 10 per cent of value of house.

Farm Earnings[1]

Earnings of the 44 farms in 1941 ranged from a loss of $425 on the least profitable farm to $5807 on the most profitable farm (figure 1 on page 12). This was a difference of $6232. Average earnings of all farms was $1944 (table 8). Average earnings for the 9 most profitable farms was $4258 and for the 9 least profitable farms was $339. The difference between the averages of these two groups was $3919.

[1] The measure of financial success used in this report is called "Operator's Labor Earnings." Operator's labor earnings represents the returns to the operator for his labor and management. It is the difference between the total farm receipts and total farm expenses. Total farm receipts include farm cash receipts, and credit for increases in farm inventory and farm produce used in the house. Total farm expenses include farm cash expenses, deductions for decreases in inventory, cost of board furnished hired help, interest on farm investment, and a charge for unpaid family labor used in the farm business.

Table 8.--Summary of Farm Earnings (Cash Statement), 1941

Items	Your farm	Average of 44 farms	9 most profitable farms	9 least profitable farms
FARM RECEIPTS				
Horses	_____	$ 11	$ 33	$ 3
Dairy and dual purpose cows	_____	264	575	103
Dairy products	_____	699	1142	349
Other dairy and dual purpose cattle	_____	193	531	78
Feeder and beef cattle	_____	208	422	0
Hogs	_____	903	1889	463
Sheep and wool (including feeders)	_____	44	61	0
Poultry (including turkeys)	_____	129	436	34
Eggs	_____	189	182	177
Crops sold - corn	_____	92	55	86
Crops sold - small grain	_____	278	810	53
Crops sold - other	_____	59	95	11
Power machinery	_____	59	58	0
Crop and general machinery	_____	21	34	1
Miscellaneous	_____	81	109	100
Income from work off farm	_____	44	51	56
A. A. A. payment	_____	193	402	88
(1) Total farm sales	_____	3467	6885	1602
(2) Increase in farm capital	_____	1065	2016	323
(3) Family living from the farm	_____	437	507	357
(4) Total farm receipts (sum of (1)+(2)+(3)	_____	4969	9408	2282
FARM EXPENSES				
Horses bought	_____	1	0	3
Dairy and dual purpose cows bought	_____	25	0	6
Other dairy & dual purpose cattle bought	_____	54	87	83
Beef cattle bought (including feeders)	_____	90	199	0
Hogs bought	_____	47	162	11
Sheep bought	_____	10	45	0
Poultry bought (including turkeys)	_____	21	40	11
Miscellaneous livestock expense	_____	12	12	14
Miscellaneous crop expense	_____	80	112	44
Feed	_____	300	484	253
Power machinery, farm share, new	_____	200	212	6
Power machinery, farm share, upkeep	_____	244	579	115
Custom work hired	_____	94	62	95
Crop and general machinery, new	_____	148	206	36
Crop and general machinery, upkeep	_____	46	111	32
Livestock equipment, new	_____	12	54	0
Livestock equipment, upkeep	_____	3	7	2
Buildings and fencing, new	_____	117	122	229
Buildings and fencing, upkeep	_____	49	114	56
Hired labor	_____	194	321	263
Taxes	_____	225	477	118
Insurance	_____	27	28	12
General farm	_____	5	8	4
(5) Total farm purchases	_____	2004	3442	1393
(6) Decrease in farm capital	_____	0	0	0
(7) Board for hired labor	_____	42	86	57
(8) Interest on farm capital*	_____	615	1031	332
(9) Unpaid family labor	_____	364	591	161
(10) Total farm expenses (sum of (5)to(9)	_____	3025	5150	1943
(11) Operator's labor earnings (4) - (10)	_____	1944	4258	339

* 5 per cent of farm investment (average of beginning and ending inventories).

Table 9.--Summary of Farm Earnings (Enterprise Statement)*, 1941

	Your farm	Average of 44 farms	9 most profitable farms	9 least profitable farms
RETURNS AND NET INCREASES				
All productive livestock	_____	3408	6687	1556
Dairy and dual purpose cows	_____	1107	2076	483
Other dairy and dual purpose cattle	_____	330	687	133
Beef breeding herd	_____	105	311	0
Feeder cattle	_____	134	257	0
Hogs	_____	1287	2593	627
Sheep	_____	44	81	0
Chickens	_____	341	429	313
Turkeys	_____	60	253	0
Crops, seed and feed	_____	390	894	23
A. A. A. payment	_____	193	402	88
Miscellaneous	_____	157	218	156
Income from work off farm	_____	44	51	56
(1) Total returns and net increase	_____	4192	8252	1879
EXPENSES AND NET DECREASES				
Total power	_____	432	814	267
Tractor	_____	200	512	65
Truck	_____	35	69	0
Auto (farm share)	_____	88	102	97
Electric plant or current (farm sh.)	_____	8	19	10
Horses	_____	101	112	95
Crop and general machinery	_____	96	214	42
Buildings and fencing	_____	135	334	177
Livestock equipment	_____	10	19	5
Misc. productive livestock expense	_____	9	10	7
Custom work hired	_____	94	61	95
Real estate taxes	_____	210	454	110
Personal property tax	_____	15	23	8
Insurance	_____	27	28	12
General farm	_____	5	8	4
Labor	_____	600	998	481
Interest on farm capital 5%	_____	615	1031	332
(2) Total expense and net decrease	_____	2248	3994	1540
(3) Operator's labor earnings (1) minus (2)	_____	1944	4258	339

*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 10.

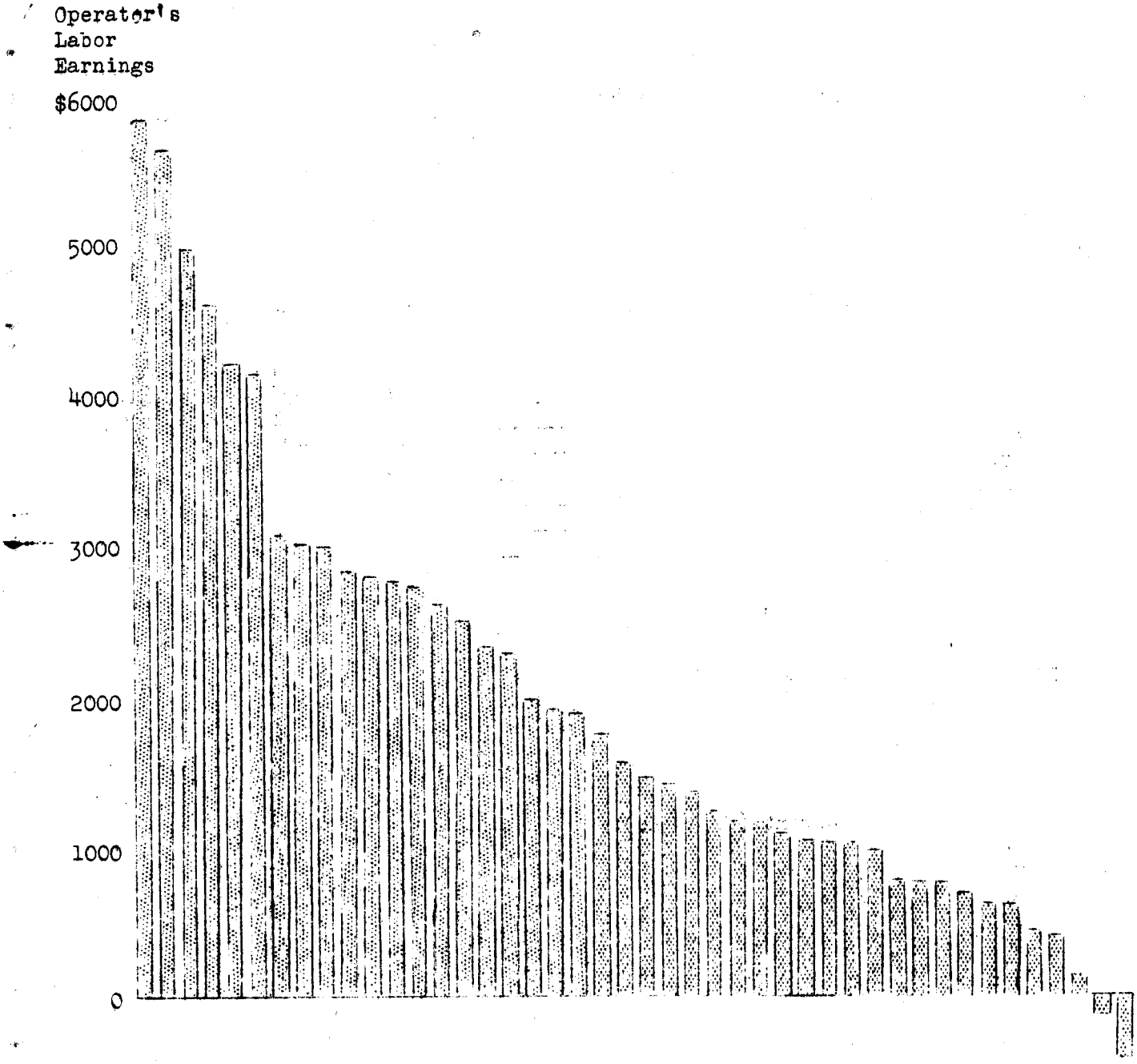

Figure 1 .--Graphic Distribution of Operator's Labor Earnings - 1941.

FACTORS AFFECTING FARM EARNINGS

Why was one man able to earn $6000 more than another man (figure 1)? How were the more profitable farms organized and how did they differ from the less profitable farms? Some of the causes for these differences in earnings may be beyond the control of the farmer. However, from the one year's data obtained in this report, there are several factors that show a definite relationship with operator's labor earnings and suggest opportunities for increased earnings. These factors are pointed out in table 10 and the following sections of the report.

Table 10.--Measures of Farm Organization and Management Efficiency, 1941

Measures	Your farm	Average of 44 farms	9 most profitable farms	9 least profitable farms
Operator's Labor Earnings	_____	$1944	$4258	$ 339
(1) Size of business - work units	_____	524	865	341
(2) Size of farm - acres	_____	364	708	190
(3) Work units per worker	_____	269	329	215
(4) Index of gross returns from productive livestock	_____	100.0	129.3	75.2
(5) Amount of productive livestock per 100 acres.*	_____	9.1	7.1	9.2
(6) Index of crop yields	_____	100.0	100.2	89.5
Items and measures related to some of the above measures:				
(1) Work units on crops	_____	243	438	149
Work units on productive livestock	_____	270	414	178
Other work units	_____	11	13	14
(3) Total number of workers	_____	2.0	2.7	1.7
Number of family workers	_____	1.6	1.8	1.2
Number of hired workers	_____	.4	.9	.5
(4) Index of gross returns from:				
Dairy cattle	_____	100	139	65
Dual purpose cattle	_____	100	130	50
Beef cattle - breeding herds	_____	100	139	-
Beef cattle - feeder cattle	_____	100	137	-
Sheep	_____	100	107	-
Hogs	_____	100	104	101
Chickens	_____	100	114	101

* Acres in timber not pastured, roads, waste, and farmstead were not included.

Size of business[1] In 1941 size of business exerted a marked influence upon farm earnings. Farms with big businesses had larger earnings than farms with small businesses (table 11). Earnings were greater because the bigger farm businesses permitted a larger volume of business. When farms are making money it pays to increase size of business as long as there is no material decrease in efficiency of operation.[2]

[1] Size of business is measured in terms of work units. A work unit is the accomplishment in a productive day of a farm worker at average efficiency. It includes work on crops, productive livestock and work off of farm. See page 4.

[2] Farm management studies made by the Division of Agricultural Economics, Minnesota Agricultural Experiment Station over a period of years show that during good years size of farm business is an advantage in increasing farm earnings and during poor years farms with large businesses are likely to be less profitable.

Larger earnings on farms with bigger businesses were made possible, in part, by the fact that each worker was able to accomplish more than on farms with smaller businesses. A large farm business enables labor saving equipment to be used to its fullest extent thus permitting more work to be accomplished per worker. Earnings on the farms with big businesses could no doubt be increased still further if crop yields could be increased without raising materially the costs involved in getting higher yields.

Table 11.--Relationship of Size of Business (Work Units) to Farm Earnings.

Number of Work Units		Number of farms	Average operator's labor earnings
Group	Average		
Below 340	283	10	$ 903
340 to 659	438	22	1565
660 or more	883	12	3528

Size of farm. The preceding relationship was between size of farm business, as measured by work units, and farm earnings. Another measure of size more familiar to most farmers is acres in farm. This measure does not take into account directly the livestock phase of the farm business.

Data in table 12 show that large farms, when measured in terms of acreage, excel small farms in earnings.

Table 12.--Relationship of Size of Farm to Farm Earnings

Acres in farm		Number of farms	Average operator's labor earnings
Group	Average		
179 or less	137	9	$1022
180 - 379	270	23	1464
380 or more	715	12	3660

Work Units Per Worker. Farm earnings were largest on farms where the most productive work was accomplished per worker (table 13). Full utilization of all available workers on productive work lowers the labor costs per unit of business and helps to increase farm earnings. Partial employment of available labor means high labor costs per unit of business and indicates that the farm is not being operated to fullest capacity of labor. Increasing the size of the farm business by farming additional land or keeping more livestock provides more work for the available laborers. A farm business with labor requirements well distributed helps to keep the family labor busy throughout the year and reduces to a minimum the amount of extra labor to be hired.

Table 13.--Relationship of Amount of Work Accomplished per Worker to Farm Earnings.

Number of Work Units per Worker		Number of farms	Average operator's labor earnings
Group	Average		
225 or less	178	13	$1081
226-335	271	20	1799
336 or more	372	11	3251

Gross Returns from Livestock. Livestock is a major source of income on these farms as indicated by the fact that 76 per cent of the cash receipts came from that source. A large proportion of the crops raised is fed to livestock as only 12 per cent of the cash receipts are from the sale of crops. In addition to the crops raised and fed, 15 per cent of the cash expenses were for additional purchased feed. Feed is a major cost in livestock production. Feeding unproductive livestock may mean lower farm earnings than if the crops had been sold directly for cash. Therefore, it is essential that it be fed to productive livestock if the greatest returns are to be realized.

The data in table 14 show how high gross returns from productive livestock are accompanied by high operator's labor earnings. The 11 farms with gross returns poorer than 80 per cent of the average of all farms had operator's labor earnings of only $1224. Farms with higher gross returns had larger earnings.

Table 14.--Relation of Index of Gross Returns from Productive Livestock to Farm Earnings.

Ineex of Gross Returns from Productive Livestock		Number of farms	Average operator's labor earnings
Group	Average		
Below 80	66.2	11	$1224
80 - 119	94.2	21	1814
120 or more	141.2	12	2854

Amount of livestock. Data in table 15 show the relationship of amount of livestock per 100 acres to farm earnings. When size of business was held constant it was found that farms with greater amounts of livestock per 100 acres had larger farm earnings. It usually pays to increase livestock numbers to what buildings and available labor can handle when livestock return a net profit. However on many farms in the Clear Lake area numbers of livestock are now limited by the amount of available labor, barn room, pasture, and feed produced. Therefore, the easiest way to increase size of business and add to the farm earnings with little increase in labor is to rent additional land and put it into small grain, principally rye. As a result, these farms have fewer livestock per 100 acres consequently have less manure to use in keeping up the fertility of the land. This is reflected in lower crop yields.

Table 15.--Relationship of Amount of Livestock per 100 Acres* to Farm Earnings

Productive Livestock Units per 100 Acres		Number of farms	Average operator's labor earnings
Group	Average		
11.4 or more	14.0	11	$1406
7.0 - 11.3	9.1	19	1998
Below 7.0	5.3	14	2312

* Acres in timber not pastured, roads, waste and farmstead were not included

Crop Yields. As indicated in table 16 farms with poor crop yields have low earnings and farms with good crop yields have high earnings. High crop yields mean more feed for livestock or sale. Additional feed means better feeding of the present livestock to increase production and the purchasing of more livestock to consume the extra feed. All help to increase farm earnings.

Low crop yields as a result of decreased fertility and damage by wind erosion curtail the total crop production, thus reducing the quantity available to feed or sell. Smaller sales of livestock, livestock products, and crops mean lower cash receipts. Reseeding of crops damaged by wind represents added expense. All help to lower farm earnings.

Table 16.--Relationship of Crop Yields to Farm Earnings

Index - Crop Yields		Number of farms	Average operator's labor earnings
Group	Average		
Below 85	73.1	11	$ 1776
85 - 112	98.2	22	1905
113 or more	130.5	11	2191

Number of Factors in Which Farmer Excels. From table 17 it can be seen that a good showing in a large number of the factors is associated with high farm earnings. Five farmers were above average in five of the six factors and had the highest earnings of any group. Six farmers were below average in all six factors and had the lowest earnings of any group. No one farmer was above average in all six of the factors associated with farm earnings. Too frequently the advantages gained by a good showing in one phase of the farm business are offset by poor results in other parts of the farm business. Physical limitations on some farms, such as poor land, buildings or machinery, may make it impossible to excel in all factors. Yet it is desirable that the farm business be developed to the point where it will return maximum earnings. This can be done by continual study of the farm business.

Table 17.--Relationship of Number of Factors in Which the Farmer is Above Average to Operator's Labor Earnings

Number of Factors in Which Farmer Excels	Number of Farms	Average Operator's Labor Earnings
0	6	$ 406
1	9	1141
2	8	1330
3	8	2048
4	8	3052
5	5	4332

EROSION PROBLEM

Wind erosion has existed in the Clear Lake area for many years according to reports obtained from the older farmers. It became more of a problem as additional land was plowed and fields were made larger. During the 1930's the problem was intensified many fold because of the drought. Thirty-five of the 44 farmers interviewed said that wind erosion existed on their farms. Of those reporting the presence of wind erosion 23 per cent said it was not an important problem, 61 per cent said that erosion was a moderately serious problem, and 16 per cent stated that wind erosion was a very serious problem on their farms. It was generally felt that the seriousness of wind erosion had increased during the last 30 years, although some farmers reported no decided change during this period. Damages to crops caused by wind erosion were the blowing out of seed and the cutting off of small grain, corn, and grass seedings by shifting sands. Fence rows were drifted with soil blown from adjacent fields.

Farmers' Control Methods

Many methods for controlling wind erosion have been tried by the farmers in this area. Variations in methods and in results were noted among farms. These control measures are grouped and discussed under the following headings:

(1) Less fall plowing.

On many farms the amount of land fall plowed has been reduced to that acreage planted to winter wheat or rye. On other farms fall plowing has been discontinued so that the land would not be bare during the winter and early spring months. Farmers were generally agreed that fall plowing tends to increase the possibility of wind erosion unless the land is sown to winter rye or wheat soon after plowing. Eighty-eight per cent of the farmers said that land plowed in the fall and put into corn or small grain in the spring was more subject to wind erosion than if spring plowed. In comparison, only 25 per cent of the farmers reported more wind erosion on spring plowed land. This proportion was slightly larger when spring plowed land was put into corn and less when seeded to small grain. Small grain is usually seeded immediately after spring plowing when the land is moist from the spring rains. Corn land is plowed later in the spring when the ground is drier and soon blows very readily.

(2) Rough tillage.

Farmers indicated that smooth fields blow more readily than rough fields. Consequently several of the farmers practice blind cultivation of corn land. Others do not drag fields, especially sand hills with a smoothing harrow. Eighty-five per cent of the farmers said that they increased the wind erosion on their farms when they used the harrow, especially if the weather was dry and windy. Ten per cent could see no difference in the amount of wind erosion and five per cent thought wind erosion was reduced by using the harrow.

The springtooth with its ridging effect of the soil helps to control wind erosion in the opinion of 71 per cent of the farmers. The remaining 29 per cent reported no noticeable difference. None reported an increase in wind erosion by using the springtooth.

Nearly one-fourth of the farmers using the disk felt that it increased wind erosion. The remaining 76 per cent reported a decrease or no noticeable difference. The general comments were to the effect that erosion would be decreased if the ground was left ridged after using the disk and that wind erosion would increase if the land was disked too much.

(3) Cover crops.

Winter wheat or rye were grown on all farms and helped to protect the soil from blowing. Alfalfa was grown on over three-fourths of the farms although only one-third of the farmers reported it being grown to control wind erosion. Most farmers preferred to seed alfalfa in June without a nurse crop on land that had been spring plowed, harrowed, and packed or rolled. Alfalfa was usually left down 3, 4, or 5 years before being plowed under. More severely eroded areas were kept in alfalfa as long as possible.

(4) Crop residue.

This involved plowing down rye or sweet clover and leaving corn stalks and straw on the field to be incorporated with the surface soil. One farmer had recently purchased a one-way disc plow which he uses for this purpose. Those farmers who had isolated spots subject to blowing found that it paid to cover them with straw or manure to prevent soil particles from breaking up readily for soil blowing. The more desirable permanent protection was to seed these places to alfalfa.

(5) Strip cropping.

Eight farmers used field strips on parts of their farms to control wind erosion. The strips varied in width from 10 to 20 rods. Four other farmers indicated that they would be putting a sizeable acreage in strips in the spring of 1942 and others said they would try strips when they seeded winter grain this fall.

Some objections to strip cropping were voiced by farmers who had not tried it. They felt that it would be difficult to raise corn on fields 15 to 20 rods in width as more time would be required for cross cultivation.