UNIVERSITY OF MINNESOTA
Department of Agriculture
and the
TENNESSEE VALLEY AUTHORITY
and the
County Extension Services of
Becker, Kittson, Mahnomen, Marshall, Norman
Pennington, Polk, Red Lake and Roseau Counties
Cooperating

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Annual Report of the Farm Management Service for T.V.A. Phosphate-Test Demonstration Cooperators in Northwestern Minnesota

(March 1, 1944 to February 28, 1945)

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Cooperator_____

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FOURTH ANNUAL REPORT OF THE FARM MANAGEMENT SERVICE FOR T.V.A. PHOSPHATE-TEST DEMONSTRATION COOPERATORS IN NORTHWESTERN MINNESOTA FOR THE YEAR 1944

Prepared by T. R. Nodland and G. A. Pond

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INTRODUCTION

The Division of Agricultural Economics and the Division of Agricultural Extension of the University of Minnesota, the Tennessee Valley Authority and the county extension services of several northwestern Minnesota counties are cooperating in a phosphate-test demonstration project and in a farm management service. This service is offered to a selected group of farmers who have agreed to demonstrate the value of phosphate fertilizer and who have also agreed to keep farm business records. The phosphate is provided by the TVA and the fieldman is provided by the TVA and the Agricultural Extension Service. Each farmer pays the freight and other miscellaneous expenses that may occur between the point of shipment and the farm on all the TVA phosphate furnished and $10.00 per year to cover the summarization of the records and other miscellaneous expenses. The balance of the cost is defrayed by the University of Minnesota.

The analysis of the farm business record and the preparation of the reports are handled by the Division of Agricultural Economics under the direction of G. A. Pond Pond and T. R. Nodland. The field organization is handled by the Division of Agricultural Extension with P. M. Burson in charge of this work. R. S. Harris was the fieldman on this project. County agricultural agents who cooperated in this project include Martin Ostrem, Howard Grow, K. N. Grimsrud, F. W. Forbes, O. A. Daellenbach, Ernest Palmer, Carl G. Ash, Rudolph Stolen, E. T. Larvick, and Melvin Hole.

The following tabulation shows by counties the number of cooperators who completed records in 1944:

Becker	2	Marshall	10	Polk	12
Kittson	6	Norman	11	Red Lake	3
Mahnomen	6	Pennington	7	Roseau	10
				Total	67

The records kept by the cooperators include inventories at the beginning and end of the year, cash receipts and expenses, and a record of the farm produce used by the farm family. Complete household and personal records were also kept by 22 cooperators. Supplementary information was secured during the year regarding crop and livestock production practices.

Because the farmers included in this study are, in general, above the average in managerial ability and operate larger and more productive farms, they have returns materially higher than the average for this section of the state. There were, nevertheless, wide variations in the methods and practices followed by these men. It is reasonable to assume that similar variations occur among all farmers in the area. To the extent that this is true, this report should be of value to all farmers and to others interested in agriculture in that it illustrates how farm records may be used as a basis for making an analysis of a farm business and for improving the management of a farm.

TYPE OF FARMING

Wheat, flax, sugar beets, potatoes, and legume seeds are grown for sale as cash crops. Dairying is the most important livestock enterprise with sheep ranking second. Some beef cattle and poultry and a small amount of hogs are also raised. Oats, barley, hay, and pasture are important feed crops.

TOPOGRAPHY, SOILS, AND WEATHER

The Red River Valley in the western part of the area is very level with black surface soils that are free of stone except in a few places where the deposit from glacial Lake Agassiz is very shallow. Along the beaches of the glacial lake the soils are gravelly and interspersed with poorly drained areas. In extremely wet seasons the surplus water can be drained from the land only very slowly. A large acreage of poorly drained land is used for hay.

East of the Red River Valley is an area lying within the old lake bed that is also very level. The soils are complexly intermixed and poorly drained. Bog areas are numerous, part open and part timbered with tamarack and spruce. A large amount of peat is found in the eastern portion of the territory.

Table 1. Monthly and Annual Precipitation

	Ada		Fosston		Angus		Roseau	
	Precipitation	Departure from normal	Precipitation	Departure from normal	Precipitation	Departure from normal	Precipitation	Departure from normal
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
January	0.25	-0.24	0.35	-0.20	0.15	-0.26	0.19	-0.44
February	0.16	-0.37	0.05	-0.55	0.01	-0.46	0.16	-0.41
March	0.53	-0.15	0.78	-0.09	0.90	+0.27	1.98	+1.18
April	0.63	-1.16	0.60	-0.95	0.43	-1.02	0.09	-1.39
May	4.59	+1.82	4.37	+1.93	2.72	+0.47	2.22	+0.04
June	6.27	+2.69	6.26	+2.66	5.51	+2.38	5.93	+2.90
July	5.82	+2.86	4.87	+1.76	1.53	-1.50	2.44	-0.55
August	7.49	+4.65	7.49	+4.65	8.34	+5.60	5.96	+3.36
September	0.76	-1.37	1.63	-0.83	0.86	-1.04	1.40	-0.79
October	0.25	-1.24	0.69	-0.83	0.50	-0.94	0.76	-0.72
November	1.66	+0.91	1.73	+0.78	3.10	+2.34	2.16	+1.25
December	0.03	-0.53	0.05	-0.61	0.01	-0.51	0.20	-0.40
1944 total	28.44	+7.87	28.87	+7.72	24.06	+5.33	23.49	+4.03
1943 total	26.66	+6.09	23.94	+2.79	18.77	+0.04	18.26	-1.20
1942 total	21.78	+1.21	27.80	+6.65	19.83	+1.10	22.35	+2.89
1941 total	33.39	+12.82	32.82	+11.67	27.01	+8.28	25.11	+5.65
1940 total	17.68	-2.89	19.96	-1.19	18.75	+0.02	19.79	+0.33
1939 total	16.91	-3.66	17.18	-3.93	17.95	-0.78	16.44	-3.02
1938 total	23.10	+2.53	19.06	-2.09	15.06	-3.67	17.16	-2.30
Normal annual precipitation	20.57		21.15		18.73		19.46	

Weather conditions in April, 1944, were quite favorable for early spring farm activities. By the end of April most of the small grains had been sown. May, June, and July were somewhat wetter than normal but, in general, crops progressed favorably. Heavy rains in August stopped threshing and damaged grain in shocks and root crops. Although there was below normal precipitation in September and October, the excessive moisture from rain in August failed to drain off the land. Heavy precipitation in November added to the difficulty of harvesting late crops.

Table 2. Monthly and Annual Temperature, 1944

	Ida		Fosston		Angus		Roseau	
	Temperature (degrees, F.)	Departure from normal	Temperature (degrees, F.)	Departure from normal	Temperature (degrees, F.)	Departure from normal	Temperature (degrees, F.)	Departure from normal
January	19.0	+14.8	19.0	+16.6	15.0	+13.0	14.0	+13.1
February	10.6	+3.1	10.3	+2.0	6.9	+0.3	5.6	+0.4
March	19.8	-3.1	18.4	-5.1	15.4	-6.9	13.9	-6.4
April	40.4	-1.5	38.0	-2.9	37.7	-2.7	37.7	-2.0
May	58.0	+3.4	55.6	+2.1	54.8	+1.5	55.3	+2.3
June	65.8	+1.9	63.2	+0.1	59.8	-2.6	60.8	-1.7
July	69.0	-0.4	65.2	-3.2	64.2	-3.3	65.5	-1.8
August	68.0	+1.2	64.6	-1.2	62.2	-3.1	63.2	-1.1
September	57.0	-0.3	55.4	-1.3	53.0	-3.1	54.3	-0.8
October	47.8	+3.6	45.0	+0.9	45.6	+2.0	44.0	+1.3
November	33.7	+7.5	32.8	+6.7	31.3	+5.4	29.5	+5.2
December	14.4	+2.9	14.1	+3.1	13.6	+3.7	10.9	+2.3

Table 3. Net Worth Statement for Those Farmers Who Kept a Complete Record of All Assets and Liabilities, 1944 (Operator's Share)

	Your Farm		22 Owners	
	Jan. 1	Dec. 31	Jan. 1	Dec. 31
Total acres in farm	———		271	
Owned	———		271	
Rented	———		-	
Total farm capital	———	———	$12956	$13699
Accounts receivable	———	———	49	1
Stocks and bonds	———	———	793	1238
Life insurance	———	———	170	180
Other outside investments	———	———	54	59
Total outside investments	———	———	1017	1477
Cash on hand and in bank	———	———	691	801
Other household and personal assets	———	———	800	811
Total cash, household and personal assets	———	———	1491	1612
TOTAL ASSETS	———	———	15513	16789
Federal Land Bank Mortgage	———	———	676	582
Land Bank Commissioner	———	———	144	138
Other mortg. on land operated	———	———	1967	1513
Production Credit Association	———	———	36	83
Other chattel mortgages	———	———	253	350
Notes payable	———	———	117	116
Accounts payable	———	———	355	413
TOTAL LIABILITIES	———	———	3548	3195
Farmer's net worth	———	———	11965	13594
Gain in net worth		———		+1629

	32 Part Owners*	
	Jan. 1	Dec. 31
Total acres in farm	485	
Owned	296	
Rented	189	
Total farm capital	$15603	$16095
Accounts receivable	2	105
Stocks and bonds	953	1742
Life insurance	316	334
Other outside investments	61	77
Total outside investments	1330	2153
Cash on hand and in bank	1010	1615
Other household & personal assets	900	988
Total cash, household & personal assets	1910	2603
TOTAL ASSETS	18845	20956
Federal Land Bank Mortgage	920	682
Other mortgage on land operated	956	904
Production Credit Association	84	-
Other chattel mortgages	177	135
Notes payable	218	158
Accounts payable	24	4
TOTAL LIABILITIES	2379	1883
Farmer's net worth	16466	19073
Gain in net worth		+2607

*11 rented for cash, 12 cash and crop share, and 9 crop share.

Table 4. Summary of Farm Earnings by Tenure, 1944

	Your farm	22 owners	32 part-owners
FARM EXPENSES			
Dairy and dual-purpose cows bought	$_____	$67	$70
Other dairy and dual-purpose cattle bought	_____	34	63
Beef cattle bought (including feeders)	_____	26	3
Hogs bought	_____	58	39
Sheep bought (including feeders)	_____	39	43
Poultry bought (including turkeys)	_____	97	140
Horses bought	_____	13	23
Misc. livestock expenses	_____	51	55
Misc. crop expenses	_____	266	486
Feed bought	_____	363	444
Custom work hired	_____	128	150
Mech. power mach. (farm share) (new)	_____	202	239
Mech. power mach. (farm share) (upkeep)	_____	145	240
Mech. power (farm share) (gas, oil, etc.)	_____	321	580
Crop and general mach. (new)	_____	317	402
Crop and general mach. (upkeep)	_____	103	129
Livestock equipment (new)	_____	20	102
Livestock equipment (upkeep)	_____	23	27
Buildings and fencing (new)	_____	112	113
Buildings and fencing (upkeep)	_____	93	184
Hired labor	_____	335	683
Taxes (real estate & personal property)	_____	174	183
General farm and insurance	_____	55	67
Cash rent	_____	-	124
Interest paid	_____	136	109
(1) Total farm purchases	_____	3178	4698
(2) Decrease in farm capital	_____	-	-
(3) Board furnished hired labor	_____	65	155
(4) Interest on farm capital	_____	530	683
(5) Unpaid family labor	_____	421	353
(6) Total farm exp. (Sum of (1) to (5)	_____	4194	5889
FARM RECEIPTS			
Dairy and dual-purpose cows	_____	237	230
Dairy products	_____	1389	1158
Other dairy and dual-purpose cattle	_____	310	467
Beef cattle (including feeders)	_____	108	178
Hogs	_____	481	769
Sheep and wool (including feeders)	_____	267	312
Poultry (including turkeys)	_____	558	617
Eggs	_____	302	432
Horses	_____	6	21
Potatoes	_____	315	585
Small grain	_____	940	2027
Other crops	_____	247	606
Machinery and equipment sold	_____	147	156
Agricultural adjustment payments	_____	160	252
Income from work off the farm	_____	147	253
Misc.	_____	11	7
(7) Total farm sales	_____	5625	8070
(8) Increase in farm capital	_____	743	492
(9) Family living from the farm	_____	568	609
(10) Total farm receipts (7) + (8) + (9)	_____	6936	9171
(6) Total farm expenses	_____	4194	5889
(11) Operator's labor earnings (10) - (6)	_____	2742	3282
(12) Net. cap. & family labor (4) + (5) + (11)	_____	3693	4318

Table 5. Summary of Farm Inventories, 1944*

Items	Your Farm Jan. 1	Your Farm Dec. 31	Average of 67 Farms Jan. 1	Average of 67 Farms Dec. 31
Size of farm (acres)	———		403	
Size of business (work units)**	———		511	
Productive livestock (total)	———	———	$2612	$2543
Dairy and dual-purpose cows	———	———	795	825
Other dairy & dual-purpose cattle	———	———	530	522
Beef cattle (incl. feeders)	———	———	477	428
Hogs	———	———	285	220
Sheep (including feeders)	———	———	395	422
Poultry (including turkeys)	———	———	130	126
Horses	———	———	256	224
Crop, seed, and feed	———	———	1789	2020
Machinery & equipment (total)	———	———	2532	2866
Power machinery (farm share)	———	———	1066	1184
Crop & general machinery (farm share)	———	———	1148	1344
Livestock equipment & supplies	———	———	318	338
Buildings, fences, etc.	———	———	3838	3793
Land	———	———	5274	5274
Total farm capital	———	———	16301	16720

	13 most profitable farms Jan. 1	13 most profitable farms Dec. 31	13 least profitable farms Jan. 1	13 least profitable farms Dec. 31
Size of farm (acres)	592		358	
Size of business (work units)**	741		420	
Productive livestock (total)	$3327	$3299	$2459	$2486
Dairy and dual-purpose cows	1004	1045	825	908
Other dairy & dual-purpose cattle	745	727	489	423
Beef cattle (including feeders)	404	405	347	475
Hogs	634	365	194	151
Sheep (including feeders)	380	590	493	404
Poultry (including turkeys)	160	167	111	125
Horses	260	236	281	236
Crop, seed, and feed	3830	4093	1480	1205
Machinery & equipment (total)	4105	4771	1847	1849
Power machinery (farm share)	1879	2052	864	831
Crop & general machinery	1752	2178	755	794
Livestock equipment & supplies	474	541	228	224
Buildings, fences, etc.	4446	4453	3501	3410
Land	8964	8964	3918	3918
Total farm capital	24932	25816	13486	13104

*For the purpose of comparison, all the data shown in this report with the exception of Tables 3 and 4 are presented on a full-owner basis. The assets, expenses and receipts of the landlord were included in the records from rented farms.

**See page 30 for an explanation of "work units."

Table 6. Farm Produce Used in House and House Rental, 1944

Items	Quantities: Your farm	Quantities: Average of 67 farms	Quantities: 13 most profitable farms	Quantities: 13 least profitable farms	Value: Your farm	Value: Average of 67 farms	Value: 13 most profitable farms	Value: 13 least profitable farms
No. of adult) Family		3.4	4.4	3.6				
equivalents) Other*		.6	.8	.5				
Whole milk		745 qts.	752	1050	$	$38.83	$39.37	$60.16
Skim milk		950 "	1989	621		8.25	19.64	3.48
Cream		431 pts.	520	399		76.44	107.13	67.00
Farm-made butter		43 lbs.	48	37		22.14	25.25	19.57
Eggs		141 doz.	199	139		43.33	60.32	43.71
Cattle		410 lbs.	491	281		42.98	59.47	29.27
Hogs		498 "	701	552		66.63	96.86	73.31
Sheep		12 "	-	7		1.01	-	1.04
Poultry		78 "	89	83		17.43	18.41	14.69
Potatoes		26 bu.	32	26		31.36	40.01	32.85
Vegetables & fruits						76.28	91.92	75.82
Farm fuel		5 cds.	8	7		30.70	45.00	42.38
Rental val.of house						138.63	145.46	144.37
Total					$	$594.01	$748.84	$607.65

Table 7. Household and Personal Expenses for Those Farms Which Kept Complete Accounts of These Expenses, 1944

Items	Your farm	Average of 22 farms	11 most profitable farms	11 least profitable farms
Number of persons - family		5.3	6.7	3.9
Number of persons, (Family adult equivalent (Other*		3.8	4.8	2.8
		.5	.7	.4
Food and meals bought	$	$399	$477	$322
Operating and supplies		134	189	79
Clothing and clothing materials		268	368	167
Personal care, personal spending		68	115	22
Furnishings and equipment		80	89	72
Education, recreation, and development		81	118	43
Medical care and health insurance		117	111	123
Church, welfare and gifts		122	162	82
Income tax		41	80	2
Personal share of auto expense		41	53	28
Household share of elect. & gas eng. exp.		14	11	18
H.H. & pers. sh. of new auto, gas eng. & motor boat.		21	42	-
Life insurance and other investments		661	1120	201
Total household and personal cash expenses		$2047	$2935	$1159
Food furnished by the farm		457	535	380
Fuel furnished by the farm		32	28	35
House rental		142	161	123
Total household and personal expenses		2678	3659	1697

*Hired help or others boarded.

Table 8. Summary of Farm Earnings (Cash Statement), 1944

Items	Your farm	Average of 67 farms	13 most profitable farms	13 least profitable farms
FARM EXPENSES				
Dairy and dual-purpose cows bought	$	$82	$96	$84
Other dairy & du. pur. cattle bought		49	92	47
Beef cattle bought (including feeders)		26	8	32
Hogs bought		38	60	38
Sheep bought (including feeders)		38	72	23
Poultry bought (including turkeys)		160	260	61
Horses bought		15	28	17
Misc. livestock expense		57	75	42
Misc. crop expenses		396	938	307
Feed bought		480	590	331
Custom work hired		133	189	106
Mech. power mach. (farm share) (new)		266	345	90
Mech. power mach. (farm share) (upkeep)		185	459	110
Mech. power (farm share) (gas, oil, etc.)		474	886	293
Crop and general mach. (new)		341	619	138
Crop and general mach. (upkeep)		120	245	73
Livestock equipment (new)		64	121	46
Livestock equipment (upkeep)		25	47	12
Buildings and fencing (new)		107	140	78
Buildings and fencing (upkeep)		149	250	86
Hired labor		541	1097	433
Taxes		217	323	174
General farm and insurance		61	84	51
(1) Total farm purchases		4024	7024	2672
(2) Decrease in farm capital		-	-	382
(3) Board furnished hired labor		124	201	100
(4) Interest on farm capital		826	1269	665
(5) Unpaid family labor		419	542	523
(6) Total farm exp. (Sum of (1) to (5)		5393	9036	4342
FARM RECEIPTS				
Dairy and dual-purpose cows	$	$244	$292	$218
Dairy products		1201	1721	1031
Other dairy & dual-purpose cattle		409	533	337
Beef cattle (including feeders)		274	192	75
Hogs		647	1228	379
Sheep and wool (including feeders)		332	134	366
Poultry (including turkeys)		660	1024	43
Eggs		402	556	266
Horses		18	16	14
Potatoes		484	1628	416
Small grain		1645	5104	361
Other crops		449	1176	167
Machinery & equip. sold		142	285	32
Agricultural adjustment payments		214	464	157
Income from work off the farm		180	261	130
Misc.		10	13	29
(7) Total farm sales		7311	14627	4021
(8) Increase in farm capital		419	884	-
(9) Family living from the farm		594	749	608
(10) Total farm receipts (7) + (8) + (9)		8324	16260	4629
(6) Total farm expenses		5393	9036	4342
(11) Oper. labor earnings (10) - (6)		2931	7224	287

Table 9. Summary of Farm Earnings (Enterprise Statement), 1944*

Items	Your farm	Average of 67 farms	13 most profitable farms	13 least profitable farms
EXPENSES AND NET DECREASES				
Total power	$_____	$885	$1519	$694
Horses	_____	139	134	141
Tractor	_____	430	797	289
Truck	_____	79	220	54
Auto (farm share)	_____	144	211	143
Gas engine (farm share)	_____	8	6	6
Elec. plant or current (farm share)	_____	27	82	14
Hired power	_____	58	69	47
Crop and general machinery	_____	226	313	173
Livestock equipment	_____	65	97	61
Buildings, fencing and tiling	_____	228	311	171
Misc. productive livestock expense	_____	56	76	42
Labor	_____	1132	1916	1096
Real estate taxes	_____	172	264	142
Personal property tax	_____	45	59	32
Insurance	_____	21	26	16
General farm	_____	40	58	35
Interest on farm capital	_____	826	1269	665
(1) Total expenses and net decreases	_____	3696	5908	3127
RETURNS AND NET INCREASES				
All productive livestock	$_____	$4090	$5585	$2833
Dairy and dual-purpose cows	_____	1449	2076	1289
Other dairy & dual-purpose cattle	_____	519	647	468
Beef cattle	_____	229	189	129
Hogs	_____	611	996	371
Sheep - farm flock	_____	323	272	255
Turkeys and capons	_____	454	688	-
Chickens	_____	505	717	321
Crops, seed and feed	_____	2116	6824	218
Income from labor off the farm	_____	131	173	117
Agricultural conservation payments	_____	214	464	157
Miscellaneous	_____	76	86	89
(2) Total returns & net increases	_____	$6627	$13132	$3414
(1) Total expenses & net decreases	_____	3696	5908	3127
(3) Oper. labor earnings (2) - (1)	_____	2931	7224	287

*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 in page 8.

ANALYSIS OF THE REASONS FOR DIFFERENCES IN OPERATOR'S EARNINGS

The operator's labor earnings varied widely among the farmers included in this study. The average labor earnings of those farmers ranking in the upper 20 per cent in the range according to earnings was $7224 and of those in the lower 20 per cent was $287. This is a range of $6937 between the average earnings of these two groups. Some of the causes for these differences in earnings may be beyond the control of the farmer. However, all of these farmers could make some changes in their farming operations which would increase earnings. A farmer can secure some ideas as to changes that could profitably be made on his farm by studying the facts about his business as presented in this report and comparing his accomplishments with other farmers following the same general type of farming. The more important management factors affecting earnings and their relationships with earnings are presented in the following tables. These factors vary from year to year in their relative influence on earnings. Because of the great importance of size of business in 1944, some of these factors do not show a significant relationship with earnings.

Table 10. Relation of Crop Yields to Farm Earnings

Per cent crop yields were of the average for all 72 farms		No. of	Average operator's
Group	Average	farms	labor earnings
Below 80	71	13	$1,106
80-114	97	39	3,218
115 and above	133	15	3,769

The data in Table 10 show that the farmers obtaining high yields had higher earnings than those obtaining low yields. 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.

Table 11. Relation of Choice of Crops to Farm Earnings

Per cent of tillable land in high return crops*		No. of	Average operator's
Group	Average	farms	labor earnings
Below 32.0	26.0	14	$1,992
32.0-52.9	44.2	39	2,505
53.0 and above	59.8	14	5,057

*Crops are marked on page 16 as (A), (B), (C), and (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.

Farmers' earnings are affected by the selection of kinds of crops to be grown as well as by the yield of crops. As a rule, on these farms, such crops as alfalfa, hard spring wheat, flax, barley, sugar beets, and potatoes bring a higher net return per acre than other crops usually grown. Additions can be made to earnings by putting as high a percentage as possible of the tillable land into these higher return crops.

Table 12. Relation of Returns from Productive Livestock to Farm Earnings

Index of gross returns from productive livestock* Group	Average	No. of farms	Average operator's labor earnings
Below 80	69	14	$2,488
80-119	97	41	2,862
120 and above	145	12	3,686

*Feed records were not kept on these farms. The index represents gross returns and is weighted by the number of animal units of each class of livestock.

Many of these farms are livestock farms. High gross returns from livestock are accompanied by high farm income. A large proportion of the crops raised are fed on the farm and some additional feed is purchased. Feed is the major item of cost in livestock production and livestock constitute an important source of income on these farms. There are a number of reasons for differences among farms in livestock returns. High productivity per animal and economy in the use of feed and labor are important. Other factors of considerable importance are kind of feed used, quality of pastures, balance of ration, degree of sanitation, and kind of shelter and equipment.

Table 13. Relation of Amount of Productive Livestock to Farm Earnings

Productive livestock units per 100 acres* Group	Average	No. of farms	Average operator's labor earnings
Below 8.0	6.6	11	$2,225
8.0-15.9	11.8	38	2,677
16.0 and above	18.6	11	2,707

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

The amount of livestock was less important during the years 1942 to 1944 than it was in 1940 and 1941. Seven very specialized crop farms with more than 50 per cent of the total work units expended on crops were omitted from the averages in Table 13. The amount of livestock is an important factor only on livestock farms. 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 recources to full and efficient capacity should add to the farm income.

Table 14. Relation of Size of Business (Work Units) to Farm Earnings

No. of work units Group	Average	No. of farms	Average operator's labor earnings
Below 375	321	19	$1,636
375-574	460	29	2,935
575 and above	780	19	4,321

The size of the farm business is measured in terms of work units. A work unit is the accomplishment of a farm worker in a ten-hour day, working on crops and productive livestock at average efficiency or ten hours of work off the farm for pay. Average farm earnings tend to increase with an increase in size of business. For farmers operating their farms at a loss, the larger the volume of business, the larger will be the loss, but 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. The size of the farm business may be increased by farming more land, by keeping more livestock or by keeping livestock or growing crops of a more intensive type.

Table 15. Relation of Amount of Work Accomplished per Worker to Farm Earnings

Work units per worker		No. of	Average operator's
Group	Average	farms	labor earnings
Below 210	172	16	$1,470
210-319	261	37	2,939
320 and above	362	14	4,582

More units of 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 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 and economical use of labor-saving machinery help to increase the work accomplished per worker.

Table 16. Relation of Power, Machinery, Equipment, and Building Expense to Farm Earnings*

Expense per work unit		No. of	Average operator's
Group	Average	farms	labor earnings
$3.30 and above	$3.95	19	$3,494
$2.10 - $3.29	2.77	30	2,597
Below $2.10	1.69	18	2,895

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

When the prices of farm products are high enough to make farming quite profitable, control over expenses is not so important as in periods of low prices. When prices are high, it is more important to secure high production than to hold down expenses. A high overhead expense may be due to a large amount of power and equipment which in turn is offset to some extent by a reduction in labor costs.

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.

CUMULATIVE EFFECT OF EXCELLING IN A NUMBER OF MANAGEMENT FACTORS

The relation of several management factors to operator's labor earnings has been shown in the preceding section. Because of the large number of interrelationships between these factors the exact relationship between one factor and earnings could not be determined. However, when the combined or cumulative influence of seven management factors on earnings is shown, the relationship becomes more marked. This is illustrated in Table 17. These seven factors alone are responsible for a considerable proportion of the variation among farmers in the returns secured from the farm business. Insofar as these factors are within the farmer's control, he will be well paid for his efforts to improve his efficiency in them.

Table 17. Relation of Operator's Labor Earnings to the Number of Factors in which the Farmer Is Above 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 labor earnings
One	5	_____	xxxxxxxxxx	$1,724
Two	13	_____	xxxxxxxxxxx	1,862
Three	21	_____	xxxxxxxxxxxxxx	2,628
Four	18	_____	xxxxxxxxxxxxxxx	2,832
Five	8	_____	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	5,520
Six	2	_____	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	6,621

The array in Table 17 indicates that it will be worth while for each cooperator to study carefully his ranking on pages 14 and 15, and learn his standing in respect to each of the above factors and the elements of strength and weakness in his farm business.

Table 18. Measures of Farm Organization and Management Efficiency, 1944

Measures used in chart on page 15	Your farm	Average of 67 farms	13 most profitable farms	13 least profitable farms
Operator's labor earnings	$_____	$2,931	$7,224	$287
(1) Crop yields*	_____	100	111	90
(2) % of tillable land in high ret. crops**	_____	43.7	51.2	39.0
(3) Gross returns from prod. livestock***	_____	100	101	92
(4) Prod. livestock units per 100 acres****	_____	11.6	10.1	11.7
(5) Size of business - work units	_____	511	741	420
(6) Work units per worker	_____	256	309	210
(7) Power, mach., equip. & bldg. exp. per work unit	$_____	$2.81	$3.14	$2.76
Items related to some of the above measures:				
(3) Index of gross returns from -				
Dairy cattle	_____	100	113	84
Dual-purpose cattle	_____	100	93	96
Beef cattle - breeding herd	_____	100	115	-
Beef cattle - feeders	_____	100	-	-
Hogs	_____	100	93	106
Sheep - farm flock	_____	100	83	81
Turkeys	_____	100	97	-
Chickens	_____	100	100	90
(5) Work units on crops	_____	194	340	147
Work units on productive livestock	_____	291	366	249
Other work units	_____	26	35	24
(6) Total number of workers	_____	2.0	2.4	2.0
Number of family workers	_____	1.4	1.5	1.5
Number of hired workers	_____	.6	.9	.5
(7) Power expense per work unit	$_____	$1.74	$2.09	$1.70
Crop machinery expense per work unit	_____	.47	.52	.44
Livestock equip. expense per work unit	_____	.14	.14	.17
Bldgs. and fencing exp. per work unit	_____	.46	.39	.45

*Given as a percentage of the average.

**Crops are marked on page 16 as (A), (B), (C), and (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.

***An index weighted by the animal units of livestock.

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

Thermometer Chart

Using your figures from page 14 locate your standing with respect to the various measures of farm organization and management efficiency. The averages for the 67 farms included in this summary are located between the dotted lines across the center of this page.

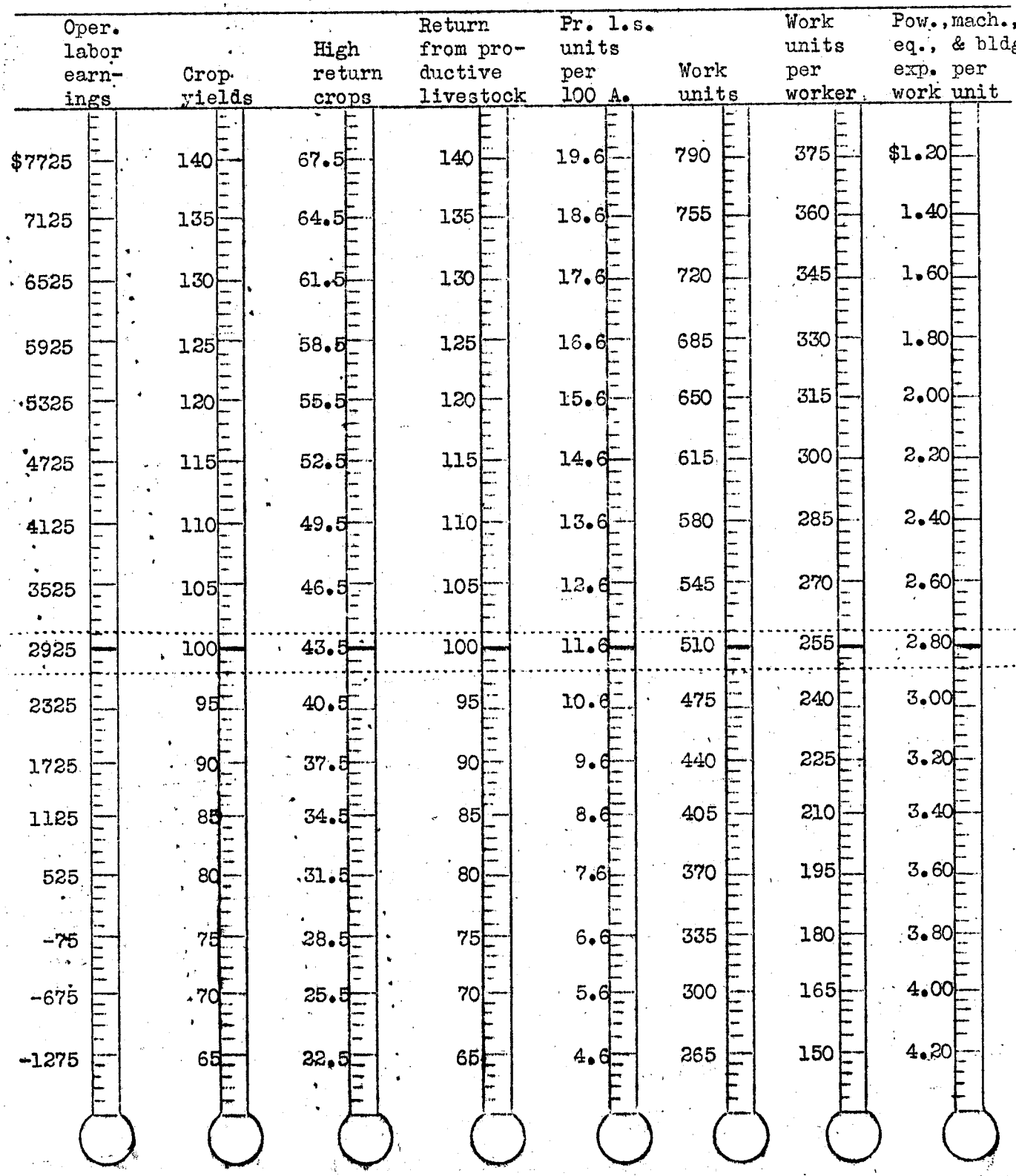

Table 19. Distribution of Acres in Farm, 1944

Crop: (A), (B), (C), and (D) refer to ranking used in calculating % of tillable land in High Return Crops (see page 14)		No. growing this crop	Your farm	Aver. of 67 farms	13 most profitable farms	13 least profitable farms	Average per farm growing each crop
Wheat, hard spring	(A)	55		35.2	90.2	11.9	42.9
Flax	(B)	27		13.6	27.6	7.0	33.6
Barley	(B)	45		19.5	40.5	8.8	29.1
Oats	(C)	66		52.0	67.8	40.1	52.8
Wheat, durum	(C)	3		2.9	10.8	-	64.3
Rye	(D)	6		3.7	10.3	8.6	41.3
Emmer (spelt)	(D)	4		.5	1.1	.5	8.0
Millet	(D)	4		.3	-	.4	5.3
Field peas	(D)	4		.8	.5	-	13.0
Total small grain and peas		67		128.5	248.8	77.3	128.5
Sugar beets, seed potatoes, and garden	(A)	9		2.5	8.1	1.5	18.5
Other potatoes	(B)	24		5.7	14.5	7.0	16.0
Corn, grain	(C)	32		8.3	6.2	6.1	17.3
Corn silage	(D)	40		9.6	10.0	8.4	16.1
Corn fodder	(D)	14		1.5	1.3	2.6	7.1
Total cultivated crops		59		27.6	40.1	25.6	31.3
Alfalfa hay and seed (hay A, seed B)		57		30.7	44.1	21.8	36.0
Alsike clover hay or seed (hay B, seed C)		8		7.7	25.2	-	64.4
Sweet clover hay	(C)	11		3.2	2.2	3.8	19.4
Sweet clover seed	(C)	20		6.7	12.2	6.4	22.4
Mixed leg.& non-leg.for hay	(C)	17		8.3	5.9	3.4	32.7
Timothy and/or brome hay	(D)	13		2.5	5.2	2.6	12.9
Misc. hay and seed crops	(D)	7		2.6	6.4	4.6	26.3
Quack grass & wild hay on tillable land	(D)	16		9.7	10.2	11.8	40.4
Total tillable land in hay		64		71.4	111.4	54.4	74.8
Alfalfa pasture	(A)	11		3.7	13.0	2.3	22.6
Mix.incl. alf.,sw.clo.,brome	(B)	26		11.3	6.0	14.0	29.1
Sweet clover pasture	(C)	23		11.2	15.2	9.4	32.8
Other tillable pasture	(D)	29		18.2	26.7	25.2	42.0
Total tillable land in pasture		59		44.4	60.9	50.9	50.4
Tillable land not cropped	(D)	39		22.1	25.5	28.2	38.1
Total tillable land		67		294.0	486.7	236.4	294.0
Wild hay (non-tillable)		27		11.5	.8	10.8	28.6
Non-tillable pasture		46		44.8	27.8	54.6	65.2
Timber (not pastured)		33		23.9	37.8	15.8	48.4
Roads and waste				20.0	29.0	12.5	
Farmstead				8.7	9.6	7.9	
Total acres in farm				402.9	591.7	338.0	
% tillable land				73.0	82.3	69.9	
% tillable land in high return crops				43.7	61.3	39.0	

Table 20. Crop Yields per Acre, 1944

Crop	Your farm	Average of 67 farms	13 most profitable farms	13 least profitable farms
Wheat, hard spring, bu.	_____	19.8	21.9	18.9
Flax, bu.	_____	6.7	7.7	4.1
Barley, bu.	_____	25.8	33.1	20.7
Oats, bu.	_____	43.0	45.7	39.2
Wheat, durum, bu.	_____	9.4	-	-
Rye, bu.	_____	9.4	-	6.8
Emmer (spelt), bu.	_____	28.7	-	-
Millet, bu.	_____	13.3	-	-
Field peas, bu.	_____	8.4	-	-
Seed potatoes, bu.	_____	107.1	138.4	-
Other potatoes, bu.	_____	71.4	81.3	46.4
Corn, grain, bu.	_____	38.5	40.0	37.2
Corn silage, tons	_____	6.4	8.1	5.7
Corn fodder, tons	_____	3.3	3.0	3.0
Alfalfa hay, tons	_____	1.8	1.6	1.8
Alfalfa seed, lbs.	_____	29.7	-	-
Alsike clover hay, tons	_____	1.8	-	-
Alsike clover seed, lbs.	_____	117.2	-	-
Sweet clover hay, tons	_____	1.1	-	.9
Sweet clover seed, lbs.	_____	228.	280.	169.
Mixed legume and non-legume hay, tons	_____	1.2	1.3	1.1
Brome grass hay, tons	_____	1.1	1.0	-
Timothy hay, tons	_____	1.1	1.3	-
Quack grass, tons	_____	1.2	-	-
Wild hay, tons	_____	.6	.5	.6

Table 21. Summary of Amount of Livestock, 1944

Items	Your farm	Average of 67 farms	13 most profitable farms	13 least profitable farms
No. of horses	_____	3.4	3.6	3.5
No. of colts	_____	.4	.3	.5
No. of dairy & dual-purpose cows	_____	11.7	15.0	11.1
Head of other dairy & dual-purpose cattle	_____	16.2	21.4	15.6
Head of cattle in beef breeding herd	_____	5.8	4.6	2.8
Litters of pigs	_____	2.9	4.8	1.8
Pounds of hogs produced	_____	4757	8219	2699
Head of sheep (2 lambs = 1 head)	_____	47.6	40.9	50.7
No. of hens	_____	109	142	89
Total no. of prod. lvstk. animal units	_____	35.8	42.9	30.4
% of total that are:				
Dairy cows	_____	21.9	27.7	14.8
Other dairy cattle	_____	14.2	18.5	9.2
Dual-purpose cows	_____	14.1	11.6	23.6
Other dual-purpose cattle	_____	11.4	9.7	20.0
Beef cattle	_____	8.9	3.9	3.9
Hogs	_____	5.9	11.4	4.2
Sheep - farm flock	_____	17.2	9.9	20.7
Turkeys and capons	_____	3.0	3.7	-
Hens	_____	3.4	3.6	3.6

Table 22. Feed Costs for Horses and Misc. Power and Machinery Expense, 1944

Items	Your farm	Average of 66 farms*	13 most profitable farms	13 least profitable farms
Feed per horse,** lbs.:				
Grain	_____	571	381	589
Hay	_____	4172	3779	3853
Feed costs per horse:				
Grain	$_____	$11.23	$7.50	$11.60
Roughage	_____	17.76	14.72	15.44
Pasture	_____	2.62	2.51	2.69
TOTAL FEED COSTS	$_____	$31.61	$24.73	$29.73
Number of work horses	_____	3.4	3.6	3.5
Number of colts	_____	.5	.3	.5
Crop acres per farm	_____	239.0	401.1	168.1
Tractor & horse exp. per crop acre	$_____	$2.61	$2.74	$2.68
Crop & gen. mach. exp. per crop acres	$_____	1.18	1.25	1.05

*One farmer did not have horses. The crop acres and expenses per crop acre are averages of 67 farms.

**Two colts equal one horse.

Table 23. Returns from Productive Livestock, 1944

Items	Your farm	Average of 67 farms	13 highest in livestock returns	13 lowest in livestock returns
DAIRY CATTLE				
No. of farms		37	7	8
Gross returns per dairy cow	$_____	$133.53	$199.22	$83.17
Pounds of butterfat per cow	_____	220	280	130
No. of heads of cows	_____	12.4	9.9	13.3
Gross ret. per head oth.dairy cattle	$_____	$34.90	$41.84	$32.22
No. head of other dairy cattle*	_____	16.0	10.1	17.8
Gross ret.per an.unit all da. cattle	$_____	$105.36	$162.63	$72.58
No. of an. units all dairy cattle	_____	20.5	14.6	22.5
DUAL-PURPOSE CATTLE				
No. of farms		25	5	5
Gross ret. per dual-purpose cow	$_____	$112.73	$135.32	$79.77
Pounds of butterfat per cow	_____	180	219	124
No. of head of cows	_____	13.0	9.2	14.6
Gross ret.per head oth.du.pur.cattle	$_____	$32.62	$30.75	$34.26
No. head oth. du. pur. cattle**	_____	22.0	17.1	22.9
Gross ret.per an.unit all du.pur.cat.	$_____	$85.42	$104.64	$65.40
No. of an. units all dual pur. cattle	_____	23.6	16.4	26.8
PRICE REC'D.PER LB. BUTTERFAT SOLD				
All butterfat (cents)	_____	60.7	62.9	60.0
Manufacturing cream (cents)	_____	58.9	58.6	58.2
Retail milk or cream (cents)	_____	82.2	81.0	80.3
BEEF-BREEDING HERD				
No. of farms		12	3	1
Gross returns per animal unit	$_____	$52.94	$77.43	-
No. animal units	_____	21.8	23.2	-
No. beef cows and bulls	_____	11.3	12.2	-
FEEDER CATTLE--1 farm				
Gross ret. per cwt. produced	$_____	-	-	-
Lbs. of cattle produced	_____	-	-	-
Price rec'd. per cwt. sold	$_____	-	-	-
HOGS				
No. of farms		51	10	9
Gross ret. per cwt. produced	$_____	$13.34	$12.70	$13.80
Lbs. hogs produced	_____	6197	6041	4512
No. spring litters	_____	3.2	2.7	1.7
No. fall litters	_____	.6	-	1.9
Total no. litters raised	_____	3.8	2.7	3.6
Pigs born per litter	_____	9.0	10.4	7.4
Pigs weaned per litter	_____	7.2	8.0	6.1
Price rec'd. per cwt. sold	$_____	$12.68	$13.99	$12.43
SHEEP-FARM FLOCK				
No. of farms		34	7	5
Gross ret. per head***	$_____	$6.88	$10.04	$3.43
No. head of sheep	_____	93	81	87
No. ewes kept for lambing	_____	67	60	62
% lamb crop****	_____	101	109	89
% death loss****	_____	10.3	13.3	12.5
Lbs. wool per sheep sheared	_____	7.3	7.4	6.4
Price rec'd. per lb. wool sold (cts.)	_____	45.5	45.3	43.5
Price rec'd. per cwt. lambs sold	$_____	$11.84	$13.41	$10.73

See page 20 for footnotes.

Table 23. Returns from Productive Livestock, 1944 (Cont.)

Items	Your farm	Average of 67 farms	13 highest in livestock returns	13 lowest in livestock returns
TURKEYS AND CAPONS				
No. of farms		12	2	3
Gross ret. per cwt. produced	$_____	$30.27	$29.77	$27.87
Lbs. produced	_____	8812	3858	11858
Price rec'd. per lb. sold (cts.)	_____	34.9	35.4	34.6
CHICKENS				
No. of farms		51	10	10
Gross ret. per hen	$_____	$4.60	$5.61	$4.10
No. hens	_____	140	108	154
Eggs per hen	_____	156	180	144
Price rec'd. per doz. eggs sold (cts.)	_____	31.2	30.8	31.4

*One farmer having both a dairy herd and a beef herd used a beef bull and included all the young stock in the beef herd.

**Two farmers having both a dual-purpose herd and a beef herd used a beef full and included all the young stock in the beef herd.

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

****Lambs which die during month of birth are not included.

EXPLANATION OF "WORK UNITS"

The total "work units" for any one farm is a measure of the size of that farm business. A work unit as used in this report is the average accomplishment of a farm worker in a ten hour day working on crops and productive livestock at average efficiency or ten hours of work off the farm for pay. The number of work units for each class of livestock and each acre of crop are presented in Table 24.

Table 24. Number of Work Units for Each Class of Livestock and Each Acre of Crop

Item	No. of work units	Item	No. of work units
Dairy and dual-pur.cow	15.5 per cow	Small grain	.7 per acre
Other dairy & dual-purpose cattle	2.4 per an. unit*	Sugar beets	2.5 per acre
Beef breeding herd	4.3 per an. unit*	Seed potatoes	4.3 per acre
Feeder cattle	.3 per 100 lbs.	Other potatoes	3.8 per acre
Sheep - farm flock	2.2 per an. unit*	Corn, husked	1.3 per acre
Hogs	.3 per 100 lbs.	Corn, shredded	2.0 per acre
Turkeys	.7 per 100 lbs.	Corn silage	1.4 per acre
Hens	28.0 per 100 hens	Corn fodder	1.1 per acre
		Alfalfa hay	.8 per acre
		Other hay crops	.6 per acre
		Legume seed	1.0 per acre

*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 1400 pounds of turkeys produced.

Table 25. Miscellaneous Information for Becker and Mahnomen Counties, 1940-1944

	1940	1941	1942	1943	1944
Operator's labor earnings	$684	$1725	$2334	$2331	$1768
MEAS. OF FARM ORG. & MGT. EFFICIENCY					
Crop yields - % of av.	102	108	99	99	102
% high return crops	28.1	33.7	38.1	42.3	45.3
Index ret. from livestock	108	109	111	110	114
A.U. per 100 A.	10.5	11.6	13.8	15.3	14.7
Work units	394	423	386	460	421
Work units per worker	207	212	193	256	263
Exp. per work unit	$1.51	$1.78	$2.50	$2.80	$3.04
DIST. OF ACRES IN FARM					
Small grain	75.3	63.5	75.4	81.9	63.9
Cult. crops	25.2	23.4	21.9	29.6	25.7
Tillable hay & seed crops	24.4	57.9	33.4	34.5	52.0
Tillable pasture	20.6	26.6	29.2	32.6	29.6
Tillable land not cropped	17.0	11.1	5.4	11.8	7.9
Total tillable land	162.5	182.5	165.3	190.4	179.1
Wild hay (non-tillable)	49.0	34.2	12.3	35.0	36.5
Non-tillable pasture	41.9	42.6	39.8	29.8	63.0
Timber, roads, waste, farmstead	53.2	69.2	59.4	40.0	30.2
Total land in farm	306.6	328.5	276.8	295.2	308.8
% land tillable	53	56	60	64	58
CROP YIELDS PER ACRE					
Spring wheat, bu.	12.6	10.8	21.8	15.0	17.0
Flax, bu.	5.1	2.8	6.0	3.3	-
Barley, bu.	19.6	33.7	32.3	15.6	18.5
Oats, bu.	30.4	38.0	51.7	32.4	45.2
Potatoes (other than for seed) bu.	95.9	76.0	65.8	58.3	40.0
Corn grain, bu.	25.0	39.1	22.0	25.0	35.8
Corn silage, tons	5.2	6.7	6.3	6.1	7.6
Alfalfa, tons	1.3	2.0	1.9	2.4	2.4
AMOUNT OF LIVESTOCK					
No. dairy & du. pur. cows	11.2	11.4	11.1	11.6	11.2
No. other dairy & du. pur. cattle	10.8	12.9	16.4	17.1	15.6
Head in beef-breeding herd	2.9	3.1	0	1.5	3.9
Litters pigs raised	1.7	2.4	3.9	7.1	3.4
Lbs. hogs produced	3052	4801	6303	10402	6148
Head sheep in farm flock	36.1	36.4	45.3	44.2	58.7
No. hens	69	80	126	123	121
Total number livestock units	26.0	28.1	31.3	34.9	33.3
% of total that are					
Milk cows	46.4	42.6	38.2	34.1	35.0
Other dairy & du. pur. cattle	23.8	28.7	30.4	27.6	27.2
Beef cattle	6.1	4.0	.4	2.0	4.6
Hogs	5.0	6.0	8.1	13.3	6.2
Sheep-farm flock	15.5	15.0	16.4	15.9	23.1
Turkeys and capons	.1	.5	2.4	3.6	0
Chickens	3.1	3.2	4.1	3.5	3.9
MISCELLANEOUS					
Work units on crops	128	133	108	153	137
Work units on livestock	236	250	272	299	274
Other work units	30	40	6	8	10
No. of workers	1.9	2.0	2.0	1.8	1.6
No. family workers	1.6	1.7	1.7	1.5	1.3
No. hired workers	.3	.3	.3	.3	.3

Table 26. Misc. Information for Kittson, W. Marshall and W. Polk Counties, 1940-44

	1940	1941	1942	1943	1944
Operator's labor earnings	$548	$3468	$4205	$4388	$5064
MEAS. OF FARM ORG. & MGT. EFFICIENCY					
Crop yields - % of av.	95	116	120	107	105
% high return crops	44.4	47.3	39.9	38.8	47.1
Index ret. from livestock	96	97	108	89	109
A.U. per 100 A.	7.0	9.0	10.5	11.2	10.6
Work units	493	516	550	594	606
Work units per worker	214	235	250	248	289
Exp. per work unit	$2.41	$2.10	$3.21	$2.36	$3.22
DIST. OF ACRES IN FARM					
Small grain	233.4	221.8	209.4	218.4	207.9
Cul. crops	31.7	32.7	43.8	45.8	40.2
Tillable hay & seed crops	40.3	44.7	34.4	62.9	77.3
Tillable pasture	41.1	27.6	50.7	38.5	49.1
Tillable land not cropped	73.7	62.1	85.1	40.2	20.4
Total tillable land	420.2	388.9	423.4	405.8	394.9
Wild hay (non-tillable)	4.7	4.4	0	8.4	1.5
Non-tillable pasture	9.4	7.5	0	23.7	19.3
Timber, roads, waste, farmstead	35.1	30.4	34.1	48.6	55.5
Total land in farm	469.4	431.2	457.5	486.5	471.2
% land tillable	90	90	93	82	84
CROP YIELDS PER ACRE					
Spring wheat, bu.	14.0	20.2	27.0	22.4	21.9
Flax, bu.	7.6	3.8	8.9	3.4	6.3
Barley, bu.	15.5	27.0	38.0	23.6	29.0
Oats, bu.	23.2	38.2	53.5	32.1	39.5
Potatoes (other than for seed) bu.	136.0	90.2	56.4	104.4	101.5
Corn grain, bu.	28.8	34.9	34.7	39.2	41.2
Corn silage, tons	7.0	6.6	6.2	5.2	7.3
Alfalfa, tons	1.2	1.6	1.9	1.7	1.7
AMOUNT OF LIVESTOCK					
No. dairy & du. pur. cows	10.7	10.6	9.7	11.7	9.6
No. other dairy & du. pur. cattle	12.9	14.6	14.8	18.5	13.7
Head in beef-breeding herd	1.9	3.3	6.6	7.6	10.0
Litters pigs raised	3.6	3.4	6.5	4.8	4.4
Lbs. hogs produced	5991	6541	12188	5747	7875
Head sheep in farm flock	20.2	14.5	24.8	61.0	62.2
No. hens	55	66	129	110	143
Total number livestock units	24.8	27.6	33.4	40.0	39.6
% of total that are					
Milk cows	46.7	44.7	33.2	35.8	33.4
Other dairy & du. pur. cattle	30.6	30.8	27.8	26.2	24.2
Beef cattle	1.9	4.0	9.2	8.0	8.2
Hogs	7.8	8.4	12.6	5.2	7.7
Sheep-farm flock	8.6	5.6	8.2	18.8	17.6
Turkeys and capons	1.6	3.7	4.8	3.3	3.9
Chickens	2.8	2.8	4.2	2.7	5.0
MISCELLANEOUS					
Work units on crops	246	243	244	238	274
Work units on livestock	231	249	290	312	297
Other work units	16	24	16	44	35
No. of workers	2.3	2.2	2.2	2.4	2.1
No. family workers	1.6	1.5	1.4	1.6	1.4
No. hired workers	.7	.7	.8	.8	.7

Table 27. Miscellaneous Information for Norman County, 1940-1944

	1940	1941	1942	1943	1944
Operator's labor earnings	$378	$1834	$3316	$2234	$1269
MEAS. OF FARM ORG. & MGT. EFFICIENCY					
Crop yields - % of av.	113	101	105	101	91
% high ret. crops	35.7	35.9	35.2	40.3	36.6
Index ret. from livestock	107	103	96	107	107
A.U. per 100 A.	8.5	9.8	10.0	12.0	10.5
Work units	469	503	463	484	476
Work units per worker	213	240	210	230	227
Exp. per work unit	$2.07	$1.97	$2.17	$3.14	$2.72
DIST. OF ACRES IN FARM					
Small grain	165.5	147.4	124.9	124.3	120.5
Cult. crops	40.1	38.9	42.9	42.0	42.2
Tillable hay & seed crops	30.6	42.0	37.6	34.8	36.4
Tillable pasture	32.2	38.9	40.1	38.9	34.3
Tillable land not cropped	36.7	51.6	46.5	53.7	52.7
Total tillable land	305.1	318.8	292.0	293.7	286.1
Wild hay (non-tillable)	9.7	9.4	3.8	.5	7.2
Non-tillable pasture	25.9	30.2	25.7	23.0	27.9
Timber, roads, waste, farmstead	36.6	37.8	67.1	37.1	45.0
Total land in farm	377.3	396.2	388.6	354.3	366.2
% land tillable	81	80	75	83	78
CROP YIELDS PER ACRE					
Spring wheat, bu.	16.2	14.6	22.1	14.4	16.7
Flax, bu.	6.4	5.0	4.5	4.8	-
Barley, bu.	24.3	29.1	33.0	18.1	28.0
Oats, bu.	30.4	26.2	43.8	29.5	33.9
Potatoes (other than for seed) bu.	102.9	58.9	46.9	99.4	26.9
Corn grain, bu.	28.1	36.8	29.4	35.7	36.2
Corn silage, tons	6.0	7.1	6.4	5.1	5.5
Alfalfa, tons	1.4	2.0	2.0	1.5	2.4
AMOUNT OF LIVESTOCK					
No. dairy & du. pur. cows	9.1	11.1	9.5	9.8	10.3
No. other dairy & du. pur. cattle	11.6	14.1	11.1	10.6	11.9
Head in beef-breeding herd	10.8	8.5	11.9	12.7	13.4
Litters pigs raised	2.9	3.5	5.8	7.9	3.2
Lbs. hogs produced	3989	5788	9582	12127	4756
Head sheep in farm flock	11.9	16.7	6.9	15.0	12.0
No. hens	64	53	66	111	80
Total number livestock units	26.6	31.3	31.0	34.6	31.0
% of total that are					
Milk cows	37.2	37.1	33.0	31.8	34.9
Other dairy & du. pur. cattle	23.9	25.5	21.6	19.0	21.1
Beef cattle	23.3	20.1	25.7	20.9	26.7
Hogs	6.0	7.2	12.4	16.5	6.8
Sheep-farm flock	4.6	6.0	2.5	4.0	3.9
Turkeys and capons	2.3	2.3	2.6	4.2	3.9
Chickens	2.7	1.8	2.2	3.6	2.7
MISCELLANEOUS					
Work units on crops	215	214	186	181	195
Work units on livestock	224	259	254	284	263
Other work units	30	30	23	19	18
No. of workers	2.2	2.1	2.2	2.1	2.1
No. family workers	1.4	1.5	1.6	1.4	1.5
No. hired workers	.8	.6	.6	.7	.6

Table 28. Misc. Information for Pennington, Red Lake & E. Polk Counties, 1940-1944

	1940	1941	1942	1943	1944
Operator's labor earnings	$790	$1578	$2275	$2027	$2442
MEAS. OF FARM ORG. & MGT. EFFICIENCY					
Crop yields - % of av.	104	92	91	91	99
% high return crops	31.9	34.2	39.9	43.3	46.4
Index ret. from livestock	95	99	95	94	95
A.U. per 100 A.	11.1	12.2	13.2	14.9	13.0
Work units	439	463	475	516	498
Work units per worker	231	244	238	246	277
Exp. per work unit	$1.72	$1.70	$1.93	$2.22	$2.54
DIST. OF ACRES IN FARM					
Small grain	101.8	82.2	75.3	87.4	103.3
Cult. crop	25.1	22.6	23.6	20.7	23.3
Tillable hay & seed crops	55.7	72.2	65.0	74.9	69.8
Tillable pasture	42.8	37.3	42.8	37.5	45.3
Tillable land not cropped	16.4	18.7	16.8	22.4	9.0
Total tillable land	241.8	233.0	223.5	242.9	250.7
Wild hay (non-tillable)	12.6	16.1	7.2	9.9	10.4
Non-tillable pasture	38.6	33.9	41.7	50.0	46.0
Timber, roads, waste, farmstead	61.3	47.4	53.5	63.8	44.3
Total land in farm	354.3	330.4	325.9	366.6	351.4
% land tillable	86	71	69	66	71
CROP YIELDS PER ACRE					
Spring wheat, bu.	14.8	15.3	21.0	17.6	20.3
Flax, bu.	7.6	4.3	4.5	2.2	7.1
Barley, bu.	20.6	18.5	35.4	14.5	27.1
Oats, bu.	26.9	30.5	46.3	27.7	47.6
Potatoes (other than for seed) bu.	87.6	30.4	76.7	48.1	84.7
Corn grain, bu.	28.9	30.4	15.6	36.5	36.8
Corn silage, tons	5.7	5.1	5.2	4.1	5.7
Alfalfa, tons	1.4	1.9	1.9	2.5	1.4
AMOUNT OF LIVESTOCK					
No. dairy & du. pur. cows	12.0	13.3	14.3	15.0	14.0
No. other dairy & du. pur. cattle	15.8	16.7	18.3	20.0	19.9
Head in beef-breeding herd	1.3	2.3	2.7	4.6	2.3
Litters pigs raised	2.7	2.9	3.9	5.3	2.6
Lbs. hogs produced	4414	4556	6303	6629	4103
Head sheep in farm flock	37.7	32.6	30.7	37.9	39.2
No. hens	65	69	92	97	111
Total number livestock units	30.4	31.3	33.9	40.5	36.8
% of total that are					
Milk cows	41.4	43.4	43.5	40.2	40.4
Other dairy & du. pur. cattle	27.8	28.8	28.0	25.6	28.8
Beef cattle	3.1	2.8	2.9	7.4	5.0
Hogs	6.2	6.3	8.2	8.9	4.6
Sheep-farm flock	16.1	14.2	12.7	13.3	14.8
Turkeys and capons	2.8	1.8	1.4	1.7	2.9
Chickens	2.6	2.7	3.3	2.9	3.5
MISCELLANEOUS					
Work units on crops	147	153	136	157	161
Work units on livestock	260	280	309	338	315
Other work units	32	30	30	21	22
No. of workers	1.9	1.9	2.0	2.1	1.8
No. family workers	1.6	1.7	1.7	1.6	1.4
No. hired workers	.3	.2	.3	.5	.4

Table 29. Miscellaneous Information for Roseau and East Marshall Counties, 1940-1944

	1940	1941	1942	1943	1944
Operator's labor earnings	$813	$1470	$2942	$1712	$3475
MEAS. OF FARM ORG. & MGT. EFFICIENCY					
Crop yields - % of av.	90	94	99	108	102
% high return crops	35.2	37.4	38.0	43.0	42.4
Index return from livestock	100	98	99	103	87
A.U. per 100 A.	9.6	9.6	11.7	9.6	10.4
Work units	468	484	490	446	522
Work units per worker	213	220	245	212	237
Exp. per work unit	$1.76	$1.76	$2.09	$2.81	$2.75
DIST. OF ACRES IN FARM					
Small grain	119.5	99.7	109.6	95.9	132.6
Cult. crops	14.1	13.2	15.0	10.8	15.8
Tillable hay & seed crops	106.9	120.8	89.8	99.0	97.6
Tillable pasture	42.4	38.9	50.7	53.8	52.8
Tillable land not cropped	20.8	20.5	55.7	48.6	23.3
Total tillable land	303.7	293.1	320.8	308.1	322.1
Wild hay (non-tillable)	12.1	8.4	11.9	14.8	10.7
Non-tillable pasture	50.5	60.9	53.6	55.4	61.8
Timber, roads, waste, farmstead	83.4	79.2	106.2	56.2	71.9
Total land in farm	449.7	441.6	492.5	434.5	466.5
% land tillable	68	66	65	71	69
CROP YIELDS PER ACRE					
Spring wheat, bu.	16.1	13.8	23.8	18.4	21.2
Flax, bu.	7.8	5.3	6.5	6.0	6.9
Barley, bu.	19.3	19.1	28.3	14.0	25.8
Oats, bu.	24.9	31.6	43.9	31.4	45.5
Potatoes (other than for seed) bu.	115.0	63.8	78.4	54.3	82.6
Corn grain, bu.	32.5	33.5	26.9	29.5	47.3
Corn silage, tons	6.5	6.4	6.9	5.5	7.1
Alfalfa, tons	.9	1.3	1.6	1.5	1.5
AMOUNT OF LIVESTOCK					
No. dairy & du. pur. cows	11.5	12.0	12.3	12.0	12.1
No. other dairy & du. pur. cattle	11.9	12.7	15.9	14.5	17.1
Head in beef-breeding herd	1.8	2.7	3.0	.7	2.8
Litters pigs raised	1.1	1.4	2.1	3.6	1.8
Lbs. hogs produced	1393	1847	3365	3567	2787
Head sheep in farm flock	64.6	64.8	63.5	74.2	61.7
No. hens	51	65	93	57	99
Total number livestock units	30.6	32.2	35.9	33.5	36.2
% of total that are					
Milk cows	41.6	40.0	38.3	35.2	34.7
Other dairy & du. pur. cattle	22.5	23.6	26.2	24.8	25.5
Beef cattle	3.1	4.0	4.8	2.1	4.1
Hogs	2.4	2.5	3.9	7.4	5.4
Sheep-farm flock	26.4	25.8	22.8	28.5	24.3
Turkeys and capons	2.5	2.3	1.8	.1	3.4
Chickens	1.5	1.8	2.2	1.9	2.6
MISCELLANEOUS					
Work units on crops	189	188	172	171	197
Work units on livestock	248	262	285	263	288
Other work units	31	34	33	12	37
No. of workers	2.2	2.2	2.0	2.1	2.2
No. family workers	1.7	1.7	1.6	1.5	1.5
No. hired workers	.5	.5	.4	.6	.7

Table 30. Summary of Farm Earnings by Years*

Items	1940	1941	1942	1943	1944
No. of farms	98	96	79	72	67
FARM EXPENSES					
Dairy and dual-purpose cattle bought	$ 71	$ 58	$ 89	$ 96	$ 131
Beef cattle bought (incl. feeders)	9	18	83	62	26
Hogs bought	10	24	54	26	38
Sheep bought (including feeders)	31	22	36	42	38
Poultry bought (including turkeys)	24	40	66	112	160
Horses bought	20	19	17	5	15
Miscellaneous livestock expense	13	20	31	49	57
Miscellaneous crop expenses	149	150	265	346	396
Feed bought	138	187	380	684	480
Custom work hired	74	63	81	133	133
Power mach. (farm share) (new)	226	222	124	148	266
Power mach. (farm share) (upkeep)	330	387	462	583	659
Crop and general mach. (new)	195	261	165	135	341
Crop and general mach. (upkeep)	50	57	88	111	120
Livestock equipment (new)	29	51	60	53	64
Livestock equipment (upkeep)	5	8	17	27	25
Buildings and fencing (new)	154	167	208	178	107
Buildings and fencing (upkeep)	79	52	84	99	149
Hired labor	211	236	324	465	541
Taxes	193	196	200	210	217
General farm and insurance	29	44	56	54	61
(1) Total farm purchases	$2,040	$2,282	$2,890	$3,618	$4,024
(2) Decrease in farm capital	-	-	-	-	-
(3) Board furnished hired labor	103	107	134	144	124
(4) Interest on farm capital	691	710	756	788	826
(5) Unpaid family labor	295	338	402	427	419
(6) Tot. farm exp. (Sum of (1) to (5)	$3,129	$3,437	$4,182	$4,977	$5,393
FARM RECEIPTS					
Dairy and dual-purpose cattle	$ 325	$ 409	$ 576	$ 612	$ 653
Dairy products	610	864	1,054	1,197	1,201
Beef cattle (including feeders)	77	118	257	300	274
Hogs	166	333	750	987	647
Sheep and wool	222	242	327	340	332
Poultry (including turkeys)	173	245	451	573	660
Eggs	65	130	263	364	402
Horses	30	37	21	22	18
Potatoes	120	174	272	416	484
Small grain	560	625	1,150	1,194	1,645
Other crops	123	185	161	285	449
Machinery and equipment sold	116	115	56	138	142
Income from labor off the farm	116	125	99	105	131
Agricultural Adjustment payments	252	248	227	205	214
Miscellaneous	133	86	96	86	59
(7) Total farm sales	$3,088	$3,936	$5,760	$6,824	$7,311
(8) Increase in farm capital	364	991	809	125	419
(9) Family living from farm	366	421	502	590	594
(10) Total farm receipts (7)+(8)+(9)	$3,818	$5,348	$7,071	$7,539	$8,324
(6) Total farm expenses	3,129	3,437	4,182	4,977	5,393
(11) Oper. labor earnings (10) - (6)	689	1,911	2,889	2,562	2,931

*The financial statements differ in that the unpaid family labor rate was $40 per month in 1940, $45 in 1941, $55 in 1942, $70 in 1943 and $80 in 1944; and the board for hired labor was calculated at $18 per month in 1940, $20 in 1941, and $25 in 1942, 1943, and 1944.

Table 31. Summary of Miscellaneous Items by Years

Items	1940	1941	1942	1943	1944
Tot. farm capital (beginning of year)	$13,639	$13,713	$14,713	$15,702	$16,301
MEASURES OF FARM ORGANIZATION AND MANAGEMENT EFFICIENCY					
% tillable land in high return crops	34.9	37.6	38.3	41.5	43.7
Prod. livestock units per 100 A.	9.6	10.5	12.0	12.7	11.6
Work units	456	481	475	506	511
Work units per worker	219	238	236	247	256
Expenses per work unit	$1.86	$1.83	$2.26	$2.64	$2.81
ACRES PER FARM - Total	397.1	390.2	395.8	391.8	402.9
Crop acres per farm	233.9	231.5	204.5	222.1	239.0
CROP YIELDS PER ACRE					
Wheat, bu. (hard spring)	15.0	15.4	22.9	17.3	19.8
Flax, bu.	7.3	4.5	6.0	4.5	6.7
Barley, bu.	20.0	23.8	32.9	16.9	25.8
Oats, bu.	26.7	32.2	46.8	30.6	43.0
Potatoes, bu.	103.4	58.7	66.9	76.3	71.4
Corn, grain, bu.	28.3	34.5	24.7	32.4	38.5
Corn silage, tons	6.1	6.2	6.3	5.1	6.4
Alfalfa hay, tons	1.2	1.7	1.8	1.8	1.8
Sweet clover hay, tons	.7	1.0	1.4	1.2	1.1
Sweet clover seed, lbs.	285	118	258	211	228
Wild hay, tons	.8	.5	.6	.6	.6
GROSS RETURNS PER:					
Dairy cow	$68.90	$95.93	$114.92	$128.95	$133.53
Dual-purpose cow	61.95	80.71	105.72	110.33	112.73
Animal unit in beef-breeding herd	58.04	57.03	80.20	51.91	52.94
Head of sheep in farm flock	5.93	7.05	11.02	7.11	6.88
100 lbs. hogs produced	5.81	10.70	14.38	12.59	13.34
Hen	1.86	2.88	3.85	4.91	4.60
100 lbs. turkeys produced	15.34	20.84	31.77	30.08	30.27
PRICE RECEIVED PER:					
Lb. B.F. sold to creameries (cts.)	30.4	37.4	45.3	53.8	58.9
100 lbs. lambs sold	$8.12	$9.88	$13.31	$11.54	$11.84
100 lbs. hogs sold	$5.32	$9.67	$13.52	$13.05	$12.68
Lb. wool sold (cts.)	28.9	40.0	41.3	43.7	45.5
Doz. eggs sold (cts.)	13.9	21.9	28.1	33.2	31.2
Lb. turkeys sold (cts.)	15.6	21.5	31.7	33.5	34.9
MISC. LIVESTOCK INFORMATION					
No. of work horses	4.0	3.6	3.7	3.6	3.4
No. of colts	.7	.8	.7	.7	.4
No. of dairy or dual-purpose cows	11.2	11.9	11.9	12.1	11.7
Head other dairy or dual-pur. cattle	13.2	14.4	15.8	16.1	16.2
Head in beef-breeding herd	3.1	3.6	4.3	6.1	5.8
Litters of pigs	2.3	2.6	4.0	5.8	2.9
Pounds of hogs produced	3,586	4,271	6,654	7,800	4,757
No. of hens	60	66	98	101	109
Head of sheep	38.8	37.4	38.4	43.7	47.6
Lbs. of butterfat per dairy cow	220	235	230	213	220
Lbs. of B.F. per dual-purpose cow	196	202	210	192	180
No. of pigs weaned per litter	7.2	7.3	7.3	6.8	7.2
% lamb crop	103	108	114	93	101
Pounds wool per sheep sheared	7.8	7.5	7.9	7.7	7.3
Eggs per hen	121	121	129	144	156