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CASH CROP FARMS IN SOUTHERN MINNESOTA

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INTRODUCTION

Approximately 36 percent of the cash receipts of farms in Minnesota in 1971, 37 percent in 1972, and 48 percent in 1973 came from the sale of crops.² Many farmers organize their farm businesses around cash crops and one or more live-stock enterprises. Others confine their farming activities to the production of crops alone. This report is based on a study of farms in southern Minnesota where cash crops constitute the major source of income.

The major objectives of this study are (1) to present data in regard to capital managed, costs and returns, and land utilization for cash crop farms, and (2) to compare and analyze factors which might account for some of the differences in earnings among farmers. The number of farm business records included

1. Professor and statistician, respectively, Department of Agricultural and Applied Economics, University of Minnesota.

2. 1973 Minnesota Cash Farm Income, Minnesota Crop and Livestock Reporting Service, Minnesota Department of Agriculture, October 1974.

The authors are deeply indebted to Dorothy Spreck for her assistance in the preparation of this report.

during the years of this study are shown in table 1. Willmar, Jackson, Mankato, Austin, and Winona vocational-technical schools, and the Southeastern and Southwestern Minnesota Farm Management Associations provided the farm record information. Farms were categorized into four groups according to size--small farms (less than 300 acres), 400-acre farms (300-499 acres), 600-acre farms (500-799 acres) and large farms (800 acres and over). The 400-acre and 600-acre groups were subdivided into two parts, according to labor earnings.

Table 1. Number of Farms Included

Group	1971	1972	1973	Average of 3 years
Less than 300 acres	10	17	31	19
300-499 acres	34	41	46	41
500-799 acres	28	54	48	43
800 acres and over	<u>15</u>	<u>21</u>	<u>21</u>	<u>19</u>
Total	87	133	146	122

For the purpose of this study, a farm was considered a cash crop farm when 80 percent or more of the cash income came from the crop enterprise. Cash income, other than from crops, included sales of livestock and livestock products, work off the farm and miscellaneous farm income.

This report enables farm operators, educators, researchers, credit agency personnel, and others to analyze and compare specific information about costs and returns from individual farm operations. The results shown in this report may yield ideas that can be examined for feasibility in the reader's own business. It is suggested that crop farmers copy figures from their own business records into the appropriate blank columns so that comparisons can be made with the most relevant averages.

Simple arithmetic averages are used throughout the report. Calculations were made for each group or category each year and the results for each of the three years were averaged.

Because farmers included in this study are, in general, above average in managerial ability and in the productivity of their farms, their returns to labor and management are higher than the average returns reported in census type data. Wide variations in management practices do exist between farms, however, and it can be assumed that similar variations occur among all farmers in the area.

CAPITAL MANAGED

The average value of capital used per farm for each size category is reported in table 2. These data represent values as reported by farmers in their farm business records. To make records comparable on a whole farm basis, landlords' shares are included. Land is valued at cost and has not been adjusted for price inflation which has occurred since its purchase. Machinery and real estate improvements are valued at cost less depreciation on the basis of estimated life. Capital managed varied considerably, with the larger acreage farms associated with the larger total capital investment. Small farms averaged less than \$100,000 capital investment compared to over \$400,000 on the large farms.

Table 3 shows investment per tillable acre. There is more variation in the operating capital than in the real estate investment per tillable acre. Value of crops on hand is the largest item in operating capital, with investment in tractors and crop machinery a close second. The investment in real estate per tillable acre is about \$350 per acre for all size categories except small farms. This compares with estimated sale prices for 1973, as reported by Mandale and Raup,¹ of \$247 per acre for West Central Minnesota, \$459 per acre for Southwestern Minnesota, and \$433 for Southeastern Minnesota. Prices reported as paid for farm land late in 1973 and in 1974 were much higher and would have a bearing on the net worth of farm families.

1. Mandale, Maurice and Philip M. Raup, "The Minnesota Real Estate Market in 1973." Economic Report ER 74-1, Department of Agricultural and Applied Economics, University of Minnesota, January 1974.

Table 2. Capital Managed on Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. Total acres per farm	_____	575	221
2. Tillable acres per farm	_____	527	202
3. Number of workers	_____	1.4	1.1
Average capital managed January 1			
4. All livestock	\$ _____	\$ 2132	\$ 822
5. Crops, seed, feed	_____	23659	8382
6. Auto and truck (farm share)	_____	2621	1240
7. Tractors and crop machinery	_____	19222	8305
8. Livestock equipment	_____	310	240
9. Farm buildings*	_____	21031	10647
10. Land	_____	163729	56109
11. Total capital managed	\$ _____	\$232704	\$ 85745
Average capital managed December 31			
12. Total capital managed	\$ _____	\$253395	\$ 93162

* Not including value of dwelling.

Table 3. Capital Managed per Tillable Acre on Cash Crop Farms, Southern Minnesota 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. All livestock	\$ _____	\$ 4	\$ 4
2. Crops, seed, feed	_____	45	42
3. Auto and truck	_____	5	6
4. Tractors and crop machinery	_____	36	41
5. Livestock equipment	_____	1	1
6. Total operating capital	\$ _____	\$ 91	\$ 94
7. Farm buildings	\$ _____	\$ 40	\$ 52
8. Land	_____	310	278
9. Total real estate	\$ _____	\$ 350	\$ 330
10. Total all capital per tillable acre	\$ _____	\$ 441	\$ 424

* Not including farm dwelling.

Table 2. Capital Managed on Cash Crop Farms, Southern Minnesota, 1971-73 (cont.)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	413	398	384	606	599	592	1080
2.	387	366	344	567	551	536	990
3.	1.2	1.2	1.2	1.3	1.4	1.4	1.9
Average capital managed January 1							
4.	\$ 1184	\$ 1429	\$ 1673	\$ 3011	\$ 2819	\$ 2627	\$ 3456
5.	27077	21842	16608	29708	27298	24889	37109
6.	2646	2307	1968	3069	2774	2478	4164
7.	15343	15826	16309	19611	19274	18936	33487
8.	146	230	313	270	252	235	519
9.	15848	16846	17844	21210	19775	18340	36857
10.	118643	111198	103753	172376	173626	174876	313984
11.	\$180887	\$169678	\$158468	\$249255	\$245818	\$242381	\$429576
Average capital managed December 31							
12.	\$199323	\$184728	\$170133	\$280494	\$270144	\$259795	\$465547

Table 3. Capital Managed per Tillable Acre on Cash Crop Farms, Southern Minnesota 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	\$ 3	\$ 4	\$ 5	\$ 5	\$ 5	\$ 5	\$ 3
2.	70	60	48	52	49	46	38
3.	7	6	6	6	5	5	4
4.	40	43	47	35	35	35	34
5.	-	-	1	-	-	-	1
6.	\$120	\$113	\$107	\$ 98	\$ 94	\$ 91	\$ 80
7.	\$ 41	\$ 46	\$ 52	\$ 37	\$ 36	\$ 35	\$ 37
8.	306	304	302	304	315	326	317
9.	\$347	\$350	\$354	\$341	\$351	\$361	\$354
10.	\$467	\$463	\$461	\$439	\$445	\$452	\$434

OPERATOR'S LABOR AND MANAGEMENT EARNINGS, CASH STATEMENT

Cash receipts, expenses, operator's labor and management earnings, and other items are presented in table 4. "Operator's labor and management earnings" is that amount that would be left as a salary to the farm operator if he paid wages equivalent to that of a hired man for the labor of the family and made a charge of six percent interest on average capital managed. Labor and management earnings were related to size of business in terms of acres. Small farms showed average earnings of \$9,806, 400-acre farms \$21,863, 600-acre farms \$33,965, while the largest farms reported earnings of \$46,507. Although this report covers a three-year period, it must be remembered that profitability varies from year to year as weather and prices received for crops sold vary.

Even though the three-year earnings were well above average, there were great variations in earnings within groups. For each size division, the top half in earnings showed over \$20,000 above the lower group. The high half in earnings for farms of 400 acres had earnings of \$32,365, while the bottom half of this group showed \$11,361 in earnings. The 600-acre farms showed a difference of \$25,928 in earnings between the top and bottom halves. The differences of acre size and total expense within individual size classes are small, when compared to the larger total receipts reported by the more efficient managers. Some of the labor earnings variations may also be attributed to differences in soil fertility and topography.

The cash statement is shown on the "per tillable acre" basis in table 5. One can note the uniform pattern of larger crop sales per tillable acre on the more profitable farms. The total per tillable acre expense of the top and bottom halves in earnings does not vary significantly. Even within size groups, the maximum difference in total farm expense is \$12.00 per tillable acre. One should note that the 600-acre farms have the highest earnings per tillable acre with \$61.

Small farms show per tillable acre earnings of \$48, while large farms realize per tillable acre earnings of \$47.

Corn makes up approximately one-half of the crop sales. A large portion of the remaining amount is from the sale of soybeans. Increases in farm capital are reported as a receipt and represent the third large item of receipts. Increases or decreases in farm capital are the differences in the average farm capital between the beginning and end of the year, as shown in table 2. This summarizes in one figure the net effect of the following changes:

1. Products produced but not sold during the year, so they are on the end of the year inventory.
2. Products that were produced during the previous year or years (on hand at the beginning of the year) and sold this year.
3. Products bought but not fully used up during the year, such as fertilizer, depreciable assets, etc.
4. Products sold that were previously purchased, such as feeder pigs and feeder cattle.
5. Depreciation on capital items.
6. Casualty losses.

The largest item of expense is the 6 percent charge for the use of farm capital managed. New purchases of power and crop machinery is the next largest item of expense. Fertilizer purchases and miscellaneous crop expenses are the largest items of operating expenses.

Table 4. Cash Statement for Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
RECEIPTS			
1. All livestock sold	\$ _____	\$ 3121	\$ 1498
2. Corn sold	_____	28272	10248
3. Other crops sold	_____	27974	10386
4. Other capital assets sold	_____	673	99
5. Income from work off the farm	_____	998	110
6. Miscellaneous farm income	_____	1752	982
7. Total farm sales	\$ _____	\$62790	\$23323
8. Increase in farm capital	_____	20691	7417
9. Family living from the farm	_____	58	40
10. Total farm receipts	\$ _____	\$83539	\$30780
EXPENSES			
11. All livestock bought	\$ _____	\$ 1094	\$ 511
12. Miscellaneous livestock expense	_____	86	50
13. Feed bought	_____	1491	1260
14. Fertilizer bought	_____	6180	2283
15. Other crop expenses	_____	6843	2364
16. Custom work hired	_____	1081	720
17. Gas, oil, grease bought	_____	1961	884
18. Repairs of power and crop machinery	_____	2938	1271
19. Repairs of real estate	_____	494	213
20. Repairs of livestock equipment	_____	38	44
21. Wages of hired labor	_____	1436	299
22. Electricity expense	_____	301	199
23. Real estate taxes	_____	3326	1269
24. General farm expense	_____	956	523
25. Total cash operating expense	\$ _____	\$28225	\$11890
26. Power and machinery bought	_____	10148	2576
27. Livestock equipment bought	_____	56	63
28. Building and real estate improvements	_____	1952	959
29. Total farm purchases	\$ _____	\$40381	\$15488
30. Decrease in farm capital	_____		
31. Interest on farm capital at 6%	_____	14583	5367
32. Unpaid family labor	_____	492	111
33. Board for hired labor	_____	48	8
34. Total farm expenses	\$ _____	\$55504	\$20974
35. Operator's labor and management earnings	\$ _____	\$28035	\$ 9806

Table 4. Cash Statement for Cash Crop Farms, Southern Minnesota, 1971-1973
(continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
RECEIPTS							
1.	\$ 2541	\$ 2220	\$ 1899	\$ 4840	\$ 4168	\$ 3496	\$ 4599
2.	27204	21793	16382	34388	30171	25954	50875
3.	20898	19308	17718	32318	30012	27706	52187
4.	581	599	617	818	966	1113	1029
5.	651	717	782	1340	1227	1115	1940
6.	1477	1144	811	1347	1513	1679	3370
7.	<u>\$53352</u>	<u>\$45781</u>	<u>\$38209</u>	<u>\$75051</u>	<u>\$68057</u>	<u>\$61063</u>	<u>\$114000</u>
8.	18436	15050	11665	31239	24326	17414	35971
9.	<u>40</u>	<u>56</u>	<u>72</u>	<u>64</u>	<u>81</u>	<u>97</u>	<u>56</u>
10.	<u>\$71828</u>	<u>\$60887</u>	<u>\$49946</u>	<u>\$106354</u>	<u>\$92464</u>	<u>\$78574</u>	<u>\$150027</u>
EXPENSES							
11.	\$ 654	\$ 768	\$ 881	\$ 1430	\$ 1476	\$ 1521	\$ 1622
12.	60	61	62	153	119	85	114
13.	884	698	513	1152	1392	1632	2612
14.	4558	4342	4125	6711	6346	5980	11747
15.	4804	4505	4206	7786	7379	6972	13124
16.	916	840	765	1130	1087	1044	1676
17.	1577	1503	1429	2144	2123	2101	3333
18.	2191	2145	2099	2940	3022	3104	5316
19.	394	367	340	388	442	496	953
20.	38	34	31	47	54	61	22
21.	835	794	753	1320	1148	977	3503
22.	223	242	260	318	316	313	447
23.	2765	2479	2193	3478	3380	3283	6176
24.	<u>705</u>	<u>740</u>	<u>776</u>	<u>1032</u>	<u>884</u>	<u>737</u>	<u>1677</u>
25.	<u>\$20604</u>	<u>\$19518</u>	<u>\$18433</u>	<u>\$30029</u>	<u>\$29168</u>	<u>\$28306</u>	<u>\$52322</u>
26.	6351	6921	7491	10905	10606	10308	20490
27.	34	23	11	72	79	86	59
28.	<u>900</u>	<u>1691</u>	<u>2482</u>	<u>2260</u>	<u>2618</u>	<u>2976</u>	<u>2540</u>
29.	<u>\$27889</u>	<u>\$28153</u>	<u>\$28417</u>	<u>\$43266</u>	<u>\$42471</u>	<u>\$41676</u>	<u>\$75411</u>
30.							
31.	11406	10632	9858	15892	15478	15065	26854
32.	141	216	291	206	496	785	1145
33.	<u>27</u>	<u>23</u>	<u>19</u>	<u>61</u>	<u>54</u>	<u>47</u>	<u>110</u>
34.	<u>\$39463</u>	<u>\$39024</u>	<u>\$38585</u>	<u>\$59425</u>	<u>\$58499</u>	<u>\$57573</u>	<u>\$103520</u>
35.	\$32365	\$21863	\$11361	\$46929	\$33965	\$21001	\$ 46507

Table 5. Cash Statement on a per Tillable Acre Basis for Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
RECEIPTS			
1. All livestock sold	\$ _____	\$ 6	\$ 7
2. Corn sold	_____	54	51
3. Other crops sold	_____	53	51
4. Other capital assets sold	_____	1	-
5. Income from work off the farm	_____	2	1
6. Miscellaneous farm income	_____	3	5
7. Total farm sales	\$ _____	\$ 119	\$ 115
8. Increase in farm capital	_____	39	37
9. Family living from the farm	_____	-	-
10. Total farm receipts	\$ _____	\$ 158	\$ 152
EXPENSES			
11. All livestock bought	\$ _____	\$ 2	\$ 3
12. Miscellaneous livestock expense	_____	-	-
13. Feed bought	_____	3	6
14. Fertilizer bought	_____	12	11
15. Other crop expenses	_____	13	12
16. Custom work hired	_____	2	4
17. Gas, oil, grease bought	_____	4	5
18. Repairs of power and crop machinery	_____	5	6
19. Repairs of real estate	_____	1	1
20. Repairs of livestock equipment	_____	-	-
21. Wages of hired labor	_____	3	1
22. Electricity expense	_____	-	1
23. Real estate taxes	_____	6	6
24. General farm expense	_____	2	3
25. Total cash operating expense	\$ _____	\$ 53	\$ 59
26. Power and machinery bought	_____	19	13
27. Livestock equipment bought	_____	-	-
28. Buildings and real estate improvements	_____	4	5
29. Total farm purchases	\$ _____	\$ 76	\$ 77
30. Decrease in farm capital	_____	-	-
31. Interest on farm capital at 6%	_____	28	27
32. Unpaid family labor	_____	1	-
33. Board for hired labor	_____	-	-
34. Total farm expense	\$ _____	\$ 105	\$ 104
35. Operator's labor and management earnings	\$ _____	\$ 53	\$ 48

Table 5. Cash Statement on a per Tillable Acre Basis for Cash Crop Farms, Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
RECEIPTS							
1.	\$ 6	\$ 6	\$ 5	\$ 9	\$ 8	\$ 7	\$ 5
2.	69	59	48	61	54	48	51
3.	53	52	52	57	54	52	53
4.	1	1	2	1	2	2	1
5.	2	2	2	2	2	2	2
6.	4	3	2	2	3	3	3
7.	\$ 135	\$ 123	\$ 111	\$ 132	\$ 123	\$ 114	\$ 115
8.	48	41	34	55	44	32	36
9.	-	-	-	-	-	-	-
10.	\$ 183	\$ 164	\$ 145	\$ 187	\$ 167	\$ 146	\$ 151
EXPENSES							
11.	\$ 2	\$ 2	\$ 3	\$ 3	\$ 3	\$ 3	\$ 2
12.	-	-	-	-	-	-	-
13.	2	2	2	2	3	3	3
14.	12	12	12	12	11	11	12
15.	12	12	12	13	13	13	13
16.	2	2	2	2	2	2	2
17.	4	4	4	4	4	4	3
18.	6	6	6	5	5	6	5
19.	1	1	1	1	1	1	1
20.	-	-	-	-	-	-	-
21.	2	2	2	2	2	2	3
22.	1	1	1	1	1	1	1
23.	7	7	7	6	6	6	6
24.	2	2	2	2	2	1	2
25.	\$ 53	\$ 53	\$ 54	\$ 53	\$ 53	\$ 53	\$ 53
26.	16	19	22	19	19	19	20
27.	-	-	-	-	-	-	-
28.	2	5	7	4	5	6	3
29.	\$ 71	\$ 77	\$ 83	\$ 76	\$ 77	\$ 78	\$ 76
30.							
31.	29	29	29	28	28	28	27
32.	-	-	-	-	1	1	1
33.	-	-	-	-	-	-	-
34.	\$ 100	\$ 106	\$ 112	\$ 104	\$ 106	\$ 107	\$ 104
35.	\$ 83	\$ 58	\$ 33	\$ 83	\$ 61	\$ 39	\$ 47

OPERATOR'S LABOR AND MANAGEMENT EARNINGS, ENTERPRISE STATEMENT

The data for earnings on an enterprise basis are presented in table 6 and are shown on the per tillable acre basis in table 7. Rather than stressing purchases and sales, the enterprise statement stresses net value produced and net expense. The net market value of crops produced less the cost of raising the crop (seed, fertilizer, chemicals and similar miscellaneous expenses) is the

Table 6. Earnings on Cash Crop Farms, Enterprise Statement, Southern Minnesota 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
RECEIPTS AND NET INCREASES			
1. All livestock	\$ _____	\$ 2442	\$ 1046
2. Feed fed	_____	1535	718
3. Value added by livestock	\$ _____	\$ 907	\$ 328
4. Crops and feed	_____	59773	22683
5. Miscellaneous farm income	_____	1752	982
6. Total value added	\$ _____	\$62432	\$23993
EXPENSES AND NET DECREASES			
7. Truck and auto	\$ _____	\$ 2080	\$ 1121
8. Electricity expense	_____	301	199
9. Tractors and crop machinery	_____	8731	3733
10. Livestock equipment	_____	110	121
11. Buildings, fencing	_____	2314	1237
12. Miscellaneous livestock expense	_____	86	50
13. Labor*	_____	1910	567
14. Real estate taxes	_____	3326	1269
15. General farm expense	_____	956	523
16. Interest on capital managed	_____	14583	5367
17. Total expenses	\$ _____	\$34397	\$14187
18. Operator's labor and management earnings	\$ _____	\$28035	\$ 9806

* Includes wages paid and value of board to hired labor, unpaid family labor and part of the payment for custom work hired.

return to crops.

Costs of operating each service enterprise (autos and trucks, tractors and crop machinery, etc.) are calculated in a similar manner.¹ Although the enterprise statement does not show purchases and sales, it more truly shows the value produced for the productive enterprises and expenses for the service enterprises.

With the help of the enterprise statement, one can better understand the difference in earnings per tillable acre. In this study, practically all of the

Table 6. Earnings on Cash Crop Farms, Enterprise Statement, Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
RECEIPTS AND NET INCREASES							
1.	\$ 2015	\$ 1756	\$ 1497	\$ 3731	\$ 3424	\$ 3118	\$ 3543
2.	<u>1106</u>	<u>1100</u>	<u>1095</u>	<u>2116</u>	<u>2182</u>	<u>2248</u>	<u>2142</u>
3.	\$ 909	\$ 656	\$ 402	\$ 1615	\$ 1242	\$ 870	\$ 1401
4.	56662	45675	34689	79370	66322	53274	104412
5.	<u>1477</u>	<u>1144</u>	<u>811</u>	<u>1347</u>	<u>1513</u>	<u>1679</u>	<u>3370</u>
6.	\$59048	\$47475	\$35902	\$82332	\$69077	\$55823	\$109183
EXPENSES AND NET DECREASES							
7.	\$ 1860	\$ 1706	\$ 1552	\$ 2279	\$ 2192	\$ 2106	\$ 3304
8.	223	241	260	318	316	313	447
9.	6802	6769	6736	8686	8936	9185	15484
10.	88	96	103	109	134	158	91
11.	1778	1902	2026	2160	2187	2214	3928
12.	60	61	62	153	119	85	114
13.	996	986	975	1296	1486	1676	4601
14.	2765	2479	2193	3478	3380	3283	6176
15.	705	740	776	1032	884	737	1677
16.	<u>11406</u>	<u>10632</u>	<u>9858</u>	<u>15892</u>	<u>15478</u>	<u>15065</u>	<u>26854</u>
17.	\$26683	\$25612	\$24541	\$35403	\$35112	\$34822	\$62676
18.	\$32365	\$21863	\$11361	\$46929	\$33965	\$21001	\$46507

1. For methods of calculation, see Nodland, Truman R., "Know Your Farm Business," University of Minnesota Agricultural Extension Pamphlet 138, revised 1971.

Table 7. Summary of Earnings, Enterprise Statement, per Tillable Acre, on Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
RECEIPTS AND NET INCREASES			
1. All livestock	\$ _____	\$ 5	\$ 5
2. Feed fed	_____	<u>3</u>	<u>3</u>
3. Value added by livestock	_____	\$ 2	\$ 2
4. Crops and feed	_____	113	112
5. Miscellaneous farm income	_____	<u>3</u>	<u>5</u>
6. Total value added	\$ _____	\$ 118	\$ 119
EXPENSES AND NET DECREASES			
7. Auto and truck	\$ _____	\$ 4	\$ 6
8. Electricity expense	_____	1	1
9. Tractors and crop machinery	_____	16	18
10. Livestock equipment	_____	-	1
11. Buildings, fencing	_____	4	6
12. Miscellaneous livestock expense	_____	-	-
13. Labor	_____	4	3
14. Real estate taxes	_____	6	6
15. General farm expense	_____	2	3
16. Interest on capital managed	_____	<u>28</u>	<u>27</u>
17. Total expenses	\$ _____	\$ 65	\$ 71
18. Operator's labor and management earnings	\$ _____	\$ 53	\$ 48

differences are due to differences in value of crops produced. Table 7 shows that the most profitable of the 400-acre farms produced \$48 more per tillable acre than the least profitable. There is \$41 difference in crop value produced between the top and bottom earnings in the 600-acre farms. The total expense per tillable acre varies little between and within size groups.

Table 7. Summary of Earnings, Enterprise Statement, per Tillable Acre, on Cash Crop Farms, Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
RECEIPTS AND NET INCREASES							
1.	\$ 5	\$ 4	\$ 4	\$ 7	\$ 6	\$ 6	\$ 4
2.	<u>3</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>2</u>
3.	\$ 2	\$ 1	\$ 1	\$ 3	\$ 2	\$ 2	\$ 2
4.	146	124	101	140	120	99	105
5.	<u>4</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>3</u>
6.	\$ 152	\$ 128	\$ 104	\$ 145	\$ 125	\$ 104	\$ 110
EXPENSES AND NET DECREASES							
7.	\$ 5	\$ 4	\$ 4	\$ 4	\$ 4	\$ 4	\$ 4
8.	1	1	1	1	1	1	0
9.	17	19	20	15	16	17	16
10.	-	-	-	-	-	-	-
11.	5	5	6	4	4	4	4
12.	-	-	-	-	-	-	-
13.	3	3	3	2	3	3	4
14.	7	7	6	6	6	6	6
15.	2	2	2	2	2	2	2
16.	<u>29</u>	<u>29</u>	<u>29</u>	<u>28</u>	<u>28</u>	<u>28</u>	<u>27</u>
17.	\$ 69	\$ 70	\$ 71	\$ 62	\$ 64	\$ 65	\$ 63
18.	\$ 83	\$ 58	\$ 33	\$ 83	\$ 61	\$ 39	\$ 47

RATE EARNED ON FARM CAPITAL MANAGED

The data in table 8 show calculation of earnings as the rate earned on capital managed. It is most useful in dealing with larger than average farms, where the contribution of capital to earnings may be more important than the contribution of the operator's labor (not including management). "Return to capital" is the residual remaining after an estimated charge of \$8200 has been deducted as the value of the operator's labor. Using a uniform charge for the operator's labor on all sizes of farms and for all levels of profitability is probably somewhat unrealistic, for the better operators more than likely could command higher wages in alternative employment situations and some of the lower earnings operators might command a wage equal to no more than that paid for

Table 8. Rate Earned on Capital Managed on Cash Crop Farms, Southern Minnesota 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. Labor and management earnings	\$_____	\$28035	\$ 9806
2. Interest on capital managed	_____	14583	5367
3. Total (1 + 2)	_____	42618	15173
4. Estimated wage for operator	_____	8200	8200
5. Return to capital (3 - 4)	_____	34418	6973
6. Average capital managed	_____	243050	89454
7. Rate earned on capital managed	_____	14.2%	7.8%

hired labor. This suggests that the returns, as shown in table 8, may be somewhat understated for the smaller and less profitable farms and overstated for the larger and more profitable operations.

A well organized farm should yield a reasonable return to all factors of production, including capital. Farmers included in this study did receive a relatively high return on the "book" value of their capital managed. If real estate values were adjusted upward to hear current prices paid for farms, however, rate earned on capital would be considerably lower. Even so, the more profitable operations would still yield a return equal to or above the interest rate farmers must pay for borrowed funds.

Table 8. Rate Earned on Capital Managed on Cash Crop Farms, Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	\$32365	\$21863	\$11361	\$46929	\$33965	\$21001	\$46507
2.	11406	10632	9858	15892	15478	15065	26854
3.	43771	32495	21219	62821	49443	36066	73361
4.	8200	8200	8200	8200	8200	8200	8200
5.	35571	24295	13019	54621	41243	27866	65161
6.	190105	177203	164300	264874	257981	251088	447562
7.	18.7%	13.7%	7.9%	20.6%	16.0%	11.1%	14.6%

THE CROPPING SYSTEM

Corn for grain, soybeans, and the feed grain program represent the major use of land on cash crop farms in this study. These account for 76 percent of the tillable acres. Table 9 shows the distribution of acres for the various crops grown. Small grains and canning crops were of minor importance. All size categories have over 90 percent tillable land.

Table 9. Distribution of Acres in Farm for Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. Canning peas	_____	5.6	3.5
2. Wheat	_____	16.8	3.9
3. Oats for grain	_____	10.5	3.9
4. Barley	_____	3.8	-
5. Flax	_____	2.4	-
6. Other small grain	_____	2.2	.4
7. Total small grain	_____	41.3	11.7
8. Corn for grain	_____	219.2	85.2
9. Soybeans	_____	181.0	76.4
10. Sweet corn	_____	10.9	-
11. Other cultivated crops	_____	13.1	5.0
12. Total cultivated crops	_____	424.2	166.6
13. Total tillable land in hay	_____	5.4	2.0
14. Total tillable land in pasture	_____	.6	-
15. Feed grain program	_____	55.1	21.5
16. Tillable land not cropped	_____	.6	-
17. Total tillable land	_____	527.2	201.8
18. Wild hay and non-tillable pasture	_____	9.9	3.9
19. Timber, waste, roads and farmstead	_____	37.5	15.5
20. Total acres in farm	_____	574.6	221.2
21. Percent land tillable	_____ %	91.8%	91.2%

Medium sized farms reported higher yields for corn and soybeans than were reported for either the smallest or largest farms included in this study. Average yields of all farms were 105 bushels for corn and 33 bushels for soybeans. There was a significant difference in corn and soybean yields between high and low earnings farms, as the top one-half in earnings outyielded the lower group by 10 to 14 bushels of corn and 5 to 7 bushels for soybeans.

Table 9. Distribution of Acres in Farm for Cash Crop Farms, Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	1.6	2.3	3.0	3.7	5.2	6.8	11.6
2.	1.6	4.4	7.2	13.6	13.2	12.7	45.5
3.	2.2	4.7	7.2	4.7	6.1	7.6	27.4
4.	.2	.1	-	2.0	1.0	-	14.1
5.	-	.2	.4	1.1	.6	-	8.7
6.	-	.4	.9	3.3	4.4	5.4	3.7
7.	<u>5.6</u>	<u>12.1</u>	<u>18.7</u>	<u>28.4</u>	<u>30.5</u>	<u>32.5</u>	<u>111.0</u>
8.	185.1	163.7	142.3	248.3	233.4	218.5	394.0
9.	145.6	137.8	130.0	210.9	199.0	187.2	311.0
10.	6.4	7.1	7.7	4.1	9.1	14.1	27.4
11.	<u>7.3</u>	<u>4.9</u>	<u>2.6</u>	<u>4.0</u>	<u>10.4</u>	<u>16.8</u>	<u>32.3</u>
12.	<u>344.4</u>	<u>313.5</u>	<u>282.6</u>	<u>467.3</u>	<u>451.9</u>	<u>436.6</u>	<u>764.7</u>
13.	1.7	3.1	4.5	10.1	7.6	5.0	8.7
14.	-	-	-	2.9	2.3	1.8	.1
15.	35.5	36.6	37.6	57.2	57.3	57.4	105.0
16.	<u>.2</u>	<u>.3</u>	<u>.5</u>	<u>.7</u>	<u>1.5</u>	<u>2.3</u>	<u>.8</u>
17.	387.4	365.6	343.9	566.6	551.1	535.6	990.3
18.	2.2	4.9	7.5	9.8	11.1	12.3	19.9
19.	<u>23.3</u>	<u>27.9</u>	<u>32.5</u>	<u>29.1</u>	<u>36.6</u>	<u>44.1</u>	<u>70.0</u>
20.	412.9	398.4	383.9	605.5	598.8	592.0	1080.2
21.	93.8%	91.8%	89.6%	93.6%	92.0%	90.5%	94.1%

Table 10. Crop Yields per Acre for Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. Wheat, bushels	_____	*	*
2. Oats for grain, bushels	_____	*	*
3. Corn for grain, bushels	_____	104.6	99.4
4. Soybeans, bushels	_____	32.8	31.0
5. Alfalfa hay, tons	_____	*	*

* Less than 5 cases per year.

Table 11. Crop Production Expenses on Cash Crop Farms, Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
1. Fertilizers bought per tillable acre	\$_____	\$11.73	\$11.30
2. Other crop expenses per tillable acre	_____	12.98	11.70
3. Tractor & machinery expense per crop acre	_____	18.54	20.74
4. Tractor & machinery investment per crop acre	_____	40.82	46.14

Some crop production expenses are presented in table 11. Fertilizer purchases per tillable acre are remarkably constant for all sizes of farms and levels of profitability. Other crop expenses per tillable acre, including purchased seed, pesticides, herbicides, etc., were greater on the larger operations. Tractor and crop machinery investment and expenses per acre showed decreases with increased acreages and high earnings farms had a smaller investment in machinery and lower expense per tillable acre than the low earnings farms.

Table 10. Crop Yields per Acre for Cash Crop Farms, Southern Minnesota
1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	*	*	34.5	35.9	35.4	34.8	*
2.	*	*	66.9	*	*	63.8	61.0
3.	113.7	106.5	99.3	112.4	107.2	102.1	105.5
4.	36.2	32.6	29.0	36.8	34.1	31.4	33.4
5.	*	*	3.6	4.4	4.1	3.8	*

Table 11. Crop Production Expenses on Cash Crop Farms, Southern Minnesota,
1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
1.	\$11.78	\$11.86	\$11.99	\$11.84	\$11.50	\$11.16	\$11.87
2.	12.41	12.31	12.23	13.73	13.37	13.00	13.26
3.	19.34	20.59	22.03	17.17	18.24	19.37	17.51
4.	43.62	48.15	53.33	38.77	39.33	39.94	37.86

SOME CONCLUDING STATEMENTS

The data in table 12 summarize earnings and some of the other characteristics of cash crop farms in Southern Minnesota. There is greater variation within various size-of-farm categories that there is between categories. More of the variation occurs in receipts than in expenses. The top managers received a return which is above current interest rates on borrowed capital, while some of the less efficient managers would find payments on borrowed capital difficult to make from their relatively low returns.

Table 12. Selected Characteristics of Cash Crop Farms in Southern Minnesota, 1971-1973

Item	Your farm	All cash crop farms	Less than 300 acres
Earnings			
1. Net cash income	\$ _____	\$22409	\$ 7835
2. Operator's labor and management earnings	\$ _____	\$28035	\$ 9806
3. Rate earned on investment	_____ %	14.2%	7.8%
Land			
4. Acres in farm	_____	575	221
5. Tillable acres in farm	_____	527	202
6. Percent tillable land in - corn grain	_____ %	42%	42%
7. - soybeans	_____ %	34%	38%
Labor			
8. Number of workers	_____	1.4	1.1
9. Work units per worker	_____	198	92
10. Tillable acres per worker	_____	376	184
11. Total value added per worker	\$ _____	\$44594	\$21812
Capital			
12. Total capital managed	\$ _____	\$243050	\$89454
13. Capital managed per worker	\$ _____	\$173607	\$81322
14. Capital managed per tillable acre	\$ _____	\$ 461	\$ 443
15. Tractor and crop machinery investment per tillable acre	\$ _____	\$ 36	\$ 41
Size of business			
16. Work units	_____	277	101
17. Total value added	\$ _____	\$62432	\$23993
Crops			
18. Crop yield per acre - corn, bushel	_____	104.6	99.4
19. - soybeans, bushel	_____	32.8	31.0
20. Value added per tillable acre	\$ _____	\$118.97	\$118.78
Expenses			
21. Power, machinery, equipment and building expense per work unit	\$ _____	\$48.87	\$63.47
22. Tractor and crop machinery expense per crop acre	\$ _____	\$18.54	\$20.74
23. Total operating expenses per \$100 of sales	\$ _____	\$44.95	\$50.97
24. Total farm purchases per \$100 of sales	\$ _____	\$64.31	\$66.40

Table 12. Selected Characteristics of Cash Crop Farms in Southern Minnesota, 1971-1973 (continued)

	300-499 acres			500-799 acres			800 acres and over
	1/2 high in earnings	Average	1/2 low in earnings	1/2 high in earnings	Average	1/2 low in earnings	
Earnings							
1.	\$25463	\$17628	\$ 9792	\$31785	\$25586	\$19387	\$38589
2.	\$32365	\$31863	\$11361	\$46929	\$33965	\$21001	\$46507
3.	18.7%	13.7%	7.9%	20.6%	16.0%	11.1%	14.6%
Land							
4.	413	398	384	606	599	592	1080
5.	387	366	344	567	551	536	990
6.	48%	45%	41%	44%	42%	41%	40%
7.	38%	38%	38%	37%	36%	35%	31%
Labor							
8.	1.2	1.2	1.2	1.3	1.4	1.4	1.9
9.	181	168	155	239	214	205	267
10.	322	305	287	436	394	383	371
11.	\$49207	\$39562	\$29918	\$63332	\$49341	\$39874	\$57465
Capital							
12.	\$190105	\$177203	\$164300	\$264874	\$257981	\$251088	\$447562
13.	\$158421	\$147669	\$136917	\$203749	\$184272	\$179349	\$235559
14.	\$ 491	\$ 484	\$ 478	\$ 467	\$ 468	\$ 468	\$ 452
15.	\$ 40	\$ 43	\$ 47	\$ 35	\$ 35	\$ 35	\$ 34
Size of business							
16.	217	202	186	311	299	287	507
17.	\$59048	\$47475	\$35902	\$82332	\$69077	\$55823	\$109183
Crops							
18.	113.7	106.5	99.3	112.4	107.2	102.1	105.5
19.	36.2	32.6	29.0	36.8	34.1	31.4	33.4
20.	\$152.58	\$129.71	\$104.37	\$145.21	\$125.37	\$104.15	\$110.29
Expenses							
21.	\$49.54	\$53.04	\$57.40	\$43.58	\$46.04	\$48.70	\$45.87
22.	\$19.34	\$20.59	\$22.03	\$17.17	\$18.24	\$19.37	\$17.51
23.	\$38.61	\$42.63	\$48.24	\$40.01	\$42.85	\$46.35	\$45.89
24.	\$52.27	\$61.49	\$74.37	\$57.64	\$62.40	\$68.25	\$66.15

Approximately 80 percent of the tillable land was planted to corn and soybeans. Tillable acres, work units, capital managed, and value added in total and per worker were greater on the larger farms than on the small farms. Each worker on the large farms operated 187 more acres and used \$154,237 more capital than the worker on the small farms. This brought about a difference of \$25,643 in the value produced per worker between these two size groups. Since these are essentially family farms, little labor was hired for most of the different size categories of farms.

Since two size categories of farms were divided into the one-half high in earnings and the one-half low in earnings, the following are some of the characteristics of the most profitable farms compared to the least profitable farms:

1. A higher percent of the tillable land in corn.
2. Higher crop yields.
3. More work units per worker (work accomplished per worker).
4. More value added in total and per worker.
5. More capital managed in total and per worker.
6. Less power, machinery, equipment and building expense per work unit.
7. Less operating expense per \$100 of sales.
8. Less total farm purchases per \$100 of sales.

Many of these differences between high and low earnings farms are essentially differences in efficiency of production and in size of business. An increase in the size of business does not, however, guarantee an increase in earnings. The farmer who does a good job with a medium sized farm is likely to have a larger income than the operator of a large scale poorly managed farm.

Few farmers can afford to be "average" during a period when production and family living costs are rising. The average and below average farmers may secure greater returns for their efforts by improving efficiency than by increasing size.