WHEAT FARMING

In the Columbia Basin of Oregon

Part 2. *Costs and Returns on Specialized Wheat-Summerfallow Farms*

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Contents

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Introduction

This publication presents income and expense data on specialized wheat-fallow farms with respect to (1) tillage practices, (2) farm sizes, (3) productivity levels, and (4) product prices. The study was designed to help individual farmers in making farm business decisions, and policymakers in determining the effect of wheat programs on individual farms.

This is the second part of a series of three publications. Part I describes dryland farming in the Columbia Basin of Oregon and lays the groundwork for subsequent studies. Part III will analyze the effect of selected programs on individual farm operations.

The technique of farm budgeting was used in this study to organize the cost and return data. To interpret properly the material to be presented later, it is necessary to understand the advantages and limitations of this particular technique.

The farm budget is a device for organizing production, price, and cost information in such a way that the relationship of these factors to farm income can be explicitly stated. A farm budget differs from historical farm records. Farm records present a summary of what has happened. With farm budgets, costs, yields, prices, or cultural practices can be projected at a particular level and the effect of these factors on income can be estimated.

As used in this study, budgets do not give the actual cost of production per bushel of wheat or barley. There are many reasons why per-bushel cost of production is difficult to obtain and why, if obtained, it must be interpreted carefully. First, many factors affect costs and they vary from one farm to another. Second, a value must be placed on the operator's labor, as well as on the time he spends on both labor and management. Third, on farms with more than one enterprise, overhead costs must be allocated among enterprises. Consequently, it is difficult to obtain a single cost per unit of production that is applicable to a group of farms or to an area.

Although budgets, as presented in this publication, do not permit accurate estimates to be made of cost of production per bushel of wheat or barley, they can be used to make comparisons. Emphasis is placed on relative costs and returns rather than on the absolute level of these items. The farmer can use the comparisons in deciding among practices or in selecting the size of operation that best fits his resources and goals. By the same token, the person interested in policy can compare the effect of a particular program on the incomes from farms of different sizes, yields, and operating practices.

The budgets are of typical farming situations. A farmer may wish to prepare budgets for his own situation rather than to apply the results of this study directly. Farmers are encouraged to do this and to keep the kind of farm records that will furnish the basis for such an analysis. Appendix D is included for use by the individual farmer.

The Budgeting Framework

Source of Data

To prepare farm budgets properly, considerable information is needed on production practices, yields, cost of input items, and prices of commodities produced. The information used in the study reported here was collected over a number of years and in a variety of ways. County Agricultural Stabilization Committee (ASC) offices supplied much of the general information on farming units. ASC records also provided a basis for selecting a sample of farms for detailed study. Much of the material needed to establish the budgets used in the study was obtained from this survey. A farm survey was carried out in the winter and spring of 1958. In the survey, records were obtained on 62 farms. Prior to the drawing of the sample, farms had been stratified by size and tillage practice. The survey was confined to those farms whose operators were

believed to follow a specialized wheat-summerfallow type of operation.[1]

In addition to these detailed records, other information was collected from various sources. To obtain more accurate data on machinery repair costs, an inquiry was mailed to the operators of the 62 farms in the 1958 survey. Twenty of the 62 farmers responded with detailed records. Another mail questionnaire was sent to a large number of farmers to obtain information about fertilizer use. Insurance agents were interviewed to determine appropriate insurance rates for the area. County tax assessors were visited to obtain realistic tax rates and appraised property values. The farm practices used in the budgets were discussed with numerous people familiar with agriculture in the area. Whenever possible, additional sources of information were checked to obtain the most reliable data possible.

Tillage Practices and Yields

Budgets were prepared for both moldboard plow and stubble mulch fallow operations. Moldboard plowing is the historically prevalent practice in the area. In this type of operation, all stubble of the previous year is turned under in the spring and the soil is left open to erosive effects of wind and rain. Then a number of lighter field operations are performed during the fallow period to control weeds and prepare the seedbed.

Stubble mulch fallow has been adopted by many farmers in recent years to reduce wind and water erosion. Special equipment in the form of the sweep or similar implements makes it possible to keep the crop residue at or near the surface as protection against erosion. Subsequent weed control and seedbed operations do not differ greatly from the moldboard method.

At present, the area is in a stage of transition from moldboard to stubble mulch fallow. Stubble mulch fallow was practiced first on the lighter soils most subject to erosion. Yields tend to be lower on stubble mulch than on moldboard fallow farms partly because of this difference in soils. Stubble mulch fallow, however, is being adopted to an increasing extent on the heavier soils. Many farms have equipment for both types of operation for two reasons: (1) on some farms, operations are in a state of transition and the farmers have not yet replaced all moldboard equipment with implements required for stubble mulch fallow, and (2) some farmers practice stubble mulch fallow most of the time, but occasionally plow their land with a moldboard for better weed control.

In the budgets, crop yields are assumed to be higher on moldboard fallow than on stubble mulch fallow land (Table 1). This yield differential is due more to soil differences than to a yield-depressing effect of the stubble mulch fallow operation. Controlled experimentation has shown that, on comparable soils, it is possible to obtain similar yields if heavier fertilization is practiced on stubble mulch fallow land. This heavier fertilization is needed to replace the nitrogen used in the decomposition of the crop residue. With the same level of fertilization, yields tend to come together over time on comparable soils under stubble mulch and moldboard fallow operations.

[1] For more detail on this survey and the sampling procedure, the reader is referred to the thesis by Barkley referred to in the acknowledgments.

Table 1. Yield Levels, by Crop and Practice[1]

Crop	Moldboard fallow	Stubble mulch fallow
	Bushels	*Bushels*
Winter wheat	32	28
Winter barley	40	36
Spring barley	38	34

[1] The two practices also reflect differences in soils and other conditions.

In budgeting work, it is difficult to obtain the proper yield relationships among crops. In Part I of this series of reports, considerable information was presented on barley and wheat yields. Historically, barley and wheat yields on a bushel basis have been quite similar. However, experience has shown that on comparable soil, barley will outyield wheat on a bushel basis. In fact, 1½ ton barley yields are not uncommon on summerfallow land. In the budgets, it is assumed that winter barley and wheat yields are approximately the same on a weight basis. In deciding on this level of yields for budget purposes, several factors were considered. Under the current allotment program, wheat is normally grown on the more productive portions of a farm, while barley is confined to the less productive land. In addition, no reseeding of winter wheat was budgeted. It was assumed that 25% of the winter barley would not survive the winter and would require reseeding in the spring. Less reseeding may be necessary in the future if the newly developed variety, Alpine, continues to show greater resistance to low temperatures than varieties in use at the present time. However, this variety has not yet been universally adopted.

Size of Farm

Farm budgets were prepared for farms in four major size groups—small, medium, medium-large, and large. Size was determined primarily on the basis of machinery and power requirements. Within each size group, three acreages of cropland were selected to indicate the range of cropland most commonly operated with the specified set of machinery (Table 2). The largest acreage within

Table 2. Size Groups, Machinery and Power Requirements, and Acreage of Cropland Budgeted for Specialized Wheat-Summerfallow Farms

Size groups	Power requirements	Acres of cropland budgeted		
Small	1 30-40 H.P. tractor	400	700	1,000
Medium	1 50-60 H.P. tractor	800	1,200	1,600
Medium-large	1 50-60 H.P. tractor 1 30-40 H.P. tractor	1,500	2,000	2,500
Large	2 50-60 H.P. tractor 1 25-35 H.P. tractor	2,400	3,000	3,600

Table 3. Land Use and Production by Size of Farm and Tillage Practice

Land use	Acreage		Production[1]		Acreage		Production[1]		Acreage		Production[1]	
	Seeded	Harvested	Moldboard fallow	Stubble mulch fallow	Seeded	Harvested	Moldboard fallow	Stubble mulch fallow	Seeded	Harvested	Moldboard fallow	Stubble mulch fallow
	Acres	*Acres*	*Bushels*	*Bushels*	*Acres*	*Acres*	*Bushels*	*Bushels*	*Acres*	*Acres*	*Bushels*	*Bushels*
SMALL FARMS	*400 acres of cropland*				*700 acres of cropland*				*1,000 acres of cropland*			
Wheat	130	130	4,160	3,640	228	228	7,296	6,384	325	325	10,400	9,100
Winter barley	52	39	1,560	1,404	92	69	2,760	2,484	131	98	3,920	3,528
Spring barley	31	31	1,178	1,054	53	53	2,014	1,802	77	77	2,926	2,618
Summerfallow	200		.....	.....	350		.....	.....	500		.....	.....
MEDIUM FARMS	*800 acres of cropland*				*1,200 acres of cropland*				*1,600 acres of cropland*			
Wheat	260	260	8,320	7,280	390	390	12,480	10,920	520	520	16,640	14,560
Winter barley	105	79	3,160	2,844	158	118	4,720	4,248	210	158	6,320	5,688
Spring barley	61	61	2,318	2,074	92	92	3,496	3,128	122	122	4,636	4,148
Summerfallow	400		.....	.....	600		.....	.....	800		.....	.....
MEDIUM-LARGE FARMS	*1,500 acres of cropland*				*2,000 acres of cropland*				*2,500 acres of cropland*			
Wheat	488	488	15,616	13,664	650	650	20,800	18,200	812	812	25,984	22,736
Winter barley	196	147	5,880	5,292	262	196	7,840	7,056	328	246	9,840	8,856
Spring barley	115	115	4,370	3,910	154	154	5,852	5,236	192	192	7,296	6,528
Summerfallow	750		.....	.....	1,000		.....	.....	1,250		.....	.....
LARGE FARMS	*2,400 acres of cropland*				*3,000 acres of cropland*				*3,600 acres of cropland*			
Wheat	780	780	24,960	21,840	975	975	31,200	27,300	1,170	1,170	37,440	32,760
Winter barley	315	236	9,440	8,496	394	296	11,840	10,656	472	354	14,160	12,744
Spring barley	184	184	6,992	6,256	229	229	8,702	7,786	276	276	10,488	9,384
Summerfallow	1,200		.....	.....	1,500		.....	.....	1,800		.....	.....

[1] For yields per harvested acre, see Table 1.

each size group approximates the acreage that can be operated on a 10-hour-day basis with the set of equipment assumed. The smallest acreage within each size group represents a transitional acreage between sets of equipment. Appendix A gives more details on machinery inventories for each size group.

Land Use

Prior to the application of the acreage allotment program in 1954, wheat was grown on most of the available cropland on specialized wheat-fallow farms. Thus, approximately one-half of the cropland was in wheat each year. In preparing the budgets, it was assumed that the 1959 acreage allotment program would be in effect and that the acreage diverted from wheat would be seeded to barley. Details of land use and crop production are presented in Table 3.

The same land use pattern was used in preparing budgets for farms of all sizes, with both cultural practices. It is assumed that one-half of the cropland is fallowed each year. Of the cropland that is not fallowed, 65% is planted to wheat. This represents the acreage allotment on which wheat can be grown. Of the remaining acreage, 75% is planted to winter barley and 25% to spring barley. In addition, a fourth of the acreage planted to barley in the fall is reseeded to spring barley. This was included to reflect the greater risk experienced in growing winter barley.[1]

Tenure

For budgeting purposes, it was assumed that all farms were fully owned by the operators. This was done to simplify income and cost comparisons by size of farm and tillage practice. If tenure had been varied with size of farm, these basic comparisons might have been obscured.

Part I of this series reports on the tenure situation in some detail. It is known that there is considerable rented land in the area with many farms partially or wholly rented. The proportion of cropland rented tends to be greater on larger farms.

Investment

Capital is the principal input item in wheat farming. The major investment on specialized wheat farms is rep-

[1] The small farm of 400 acres of cropland has been selected to illustrate the computation of land use:
400 acres of total cropland; 200 acres of summerfallow (50% of 400 acres)
Wheat seeded and harvested: 130 acres (65% of 200 acres)
Winter barley seeded: 52 acres (75% of 70 acres diverted)
Winter barley harvested: 39 acres (75% of 52 acres seeded)
Spring barley seeded and harvested: 31 acres
(13 acres of winter barley reseeded to spring barley plus 25% of 70 acres diverted from wheat)

Table 4. Investment per Farm and per Acre of Cropland by Tillage Practice and Size of Farm

Cropland	Land	Farm buildings	Machinery and equipment	Investment	
				Per farm	Per acre of cropland
Acres					
MOLDBOARD FALLOW OPERATION					
Small					
400	$ 60,000	$ 2,700	$ 16,815	$ 79,515	$199
700	105,000	2,700	16,815	124,515	178
1,000	150,000	2,700	16,815	169,515	170
Medium					
800	120,000	5,500	39,000	164,500	206
1,200	180,000	5,500	39,000	224,500	187
1,600	240,000	5,500	39,000	284,500	178
Medium-large					
1,500	225,000	12,000	66,050	303,050	202
2,000	300,000	12,000	66,050	378,050	189
2,500	375,000	12,000	66,050	453,050	181
Large					
2,400	360,000	20,000	108,150	488,150	203
3,000	450,000	20,000	108,150	578,150	193
3,600	540,000	20,000	108,150	668,150	186
STUBBLE MULCH FALLOW OPERATION					
Small					
400	$ 46,000	$ 2,700	$ 19,415	$ 68,115	$170
700	80,500	2,700	19,415	102,615	147
1,000	115,000	2,700	19,415	137,115	137
Medium					
800	92,000	5,500	42,900	140,400	176
1,200	138,000	5,500	42,900	186,400	155
1,600	184,000	5,500	42,900	232,400	145
Medium-large					
1,500	172,500	12,000	71,550	256,050	171
2,000	230,000	12,000	71,550	313,550	157
2,500	287,500	12,000	71,550	371,050	148
Large					
2,400	276,000	20,000	116,450	412,450	172
3,000	345,000	20,000	116,450	481,450	160
3,600	414,000	20,000	116,450	550,450	153

resented by three main classes of assets—land, buildings, and machinery. The values used in the budgets for each of these items are given in Table 4.

Land is the largest investment item. An attempt was made to relate land values to the productivity of the soil. Moldboard fallow land yielding 32 bushels of wheat per acre was valued at $150 per acre; stubble mulch fallow land yielding 28 bushels per acre was priced at $115 per acre. These values are consistent with current appraised values for taxation purposes.

Farm buildings (not including farm dwelling) represent a relatively small item of investment. Values were determined largely on the basis of farmers' valuations obtained in the survey mentioned earlier. Building investment was varied by size group but was held constant for all acreages within each size group. Since the farm machinery inventory remains the same for each size group, there is little need for additional machinery storage or repair facilities as acreage increases within each size group.

Machinery investment is itemized in Appendix A. For the small size group, many of the major machinery items were assumed to be purchased as used equipment rather than new. On the larger farms, certain equipment used for performance of less important jobs was assumed to be either old or bought secondhand. Utility trucks are an ex-

ample. The farm survey indicated that purchase of used equipment was a common practice, especially for the smaller farms. Certain items, such as deep furrow drills which are used primarily on stubble mulch fallow farms, have not been in use long enough to be generally available on the secondhand market.

The level of investment in machinery and equipment in the budgets is similar to that reported by farmers in the survey. Only the equipment required for wheat farming was included. Machinery inventories should be viewed as the minimum needed to perform the necessary operations, although excess capacity exists for the smallest and middle acreages within each size group. For stubble mulch fallow operations, investment in equipment is somewhat larger than for moldboard fallow because some new equipment is needed while some of the older equipment is still on hand.

Table 4 gives assumed investment data for the budgeted farms, both for the entire farm and on a per-acre basis. Investment per acre increases as one moves from the smaller to the larger size groups. This is chiefly because the proportion of new machinery relative to used machinery and equipment was assumed to be higher in the larger size groups, and because building investment was assumed to increase with machinery investment as a result of larger service and storage facility requirements.

Prices and Costs

So far as possible, 1959 cost and product price relationships were used. Support prices for barley and wheat provided guidance in selecting product prices. The prices of $1.79 per bushel for wheat and $0.87 for barley reflect net returns to farmers based on the 1959 average support level for the Columbia Basin. Cost of materials, hired labor, and other input factors are also on a 1959 basis. The method of calculating costs is given in Appendix C.

Costs and Returns

Only summary tables are presented here to accompany the discussion. Complete information on individual budgets and method of computation can be found in the appendix. From the material presented there, it is possible to verify each of the cost and return figures.

As was explained earlier, the budgets were constructed on the basis of average yields, prices, and costs in the area. Thus, the data presented may not represent conditions found on any particular farm. Individual farmers may wish to prepare their own cost and return estimates. A form has been provided for this purpose in Appendix D.

Terminology

In subsequent discussions of budget results certain accounting terms are used. These terms are defined as follows:

(1) Gross farm income is number of bushels of wheat and barley produced multiplied by the prices received per bushel.

(2) Cash operating costs include those cash costs that must be incurred if a crop is to be produced. These costs usually vary directly with the acreage operated and/or quantities produced. Examples of such expenses are seed, fertilizer, and tractor fuel.

(3) Cash overhead costs are expenses that are not associated with a particular crop but which must generally be met on a yearly basis, such as taxes and insurance.

(4) Total cash costs are the sum of cash operating costs and cash overhead costs.

(5) Cash farm income is gross income less total cash costs.

(6) Total farm expense includes all cash costs plus depreciation.

(7) Net farm income is gross income minus total farm expense. This represents the farmer's return to his capital, labor, and management.

(8) Interest on investment represents an arbitrary charge for the use of capital (5% on total investment in real estate, 6% on investment in machinery and equipment, and 7% on working capital).

(9) Return to operator's labor and management is the residual after the charge for interest is subtracted from net farm income.

Moldboard Fallow System

A summary of the cost and return budgets for the moldboard fallow operation is given in Table 5. Gross farm income increases at a constant rate as acreage of cropland increases. This is to be expected as a result of the assumption that yields and proportionate land use will remain the same as size of farm increases. Operating costs tend to increase at a constant rate, but less rapidly than gross income. Cash overhead costs such as taxes, insurance, and repairs increase somewhat more rapidly than acreage for the medium-large and large size groups. This is primarily because investment per acre tends to increase as acreage increases. Total farm expenses (total cash costs plus depreciation) behave in about the same way as total cash operating costs.

Costs per acre of cropland tend to increase with size of farm (Table 6). Cash costs, both operating and overhead, total farm expenses, and interest charges decrease on a per-acre basis as acreage increases within each size group, but they tend to increase between one size group and the next. This illustrates that efficiency in investments on the small farms (more used equipment) can more than offset economies usually attributed to increasing size of operation.

Both cash farm income and net farm income increase as acreage increases (Table 5). The slightly higher per-acre costs on the medium-large and large farms are more than offset by the greater number of acres operated. For

Table 5. Income and Expense Budgets, by Size of Farm and Acreage of Cropland, Moldboard Fallow Operation

Item	Small			Medium		
	400 acres	700 acres	1,000 acres	800 acres	1,200 acres	1,600 acres
Gross Farm Income	$ 9,828	$17,213	$24,572	$19,659	$29,487	$39,317
Cash operating costs	3,166	5,299	7,450	5,878	8,498	11,134
Cash overhead costs	1,811	2,565	3,335	3,545	4,568	5,603
Total cash costs	4,977	7,864	10,785	9,423	13,066	16,737
Cash Farm Income	4,851	9,349	13,787	10,236	16,421	22,580
Depreciation	1,285	1,285	1,285	2,043	2,043	2,043
Total farm expenses	6,262	9,149	12,070	11,466	15,109	18,780
Net Farm Income	3,566	8,064	12,502	8,193	14,378	20,537
Total interest charges	4,231	6,532	8,833	8,780	11,844	14,908
Return to Operator's Labor and Management	—665	1,532	3,669	—587	2,534	5,629

Item	Medium-large			Large		
	1,500 acres	2,000 acres	2,500 acres	2,400 acres	3,000 acres	3,600 acres
Gross Farm Income	$36,871	$49,144	$61,420	$58,974	$73,720	$88,462
Cash operating costs	11,677	15,131	18,698	18,572	22,875	27,373
Cash overhead costs	6,689	8,082	9,492	10,950	12,758	14,588
Total cash costs	18,366	23,213	28,190	29,522	35,633	41,961
Cash Farm Income	18,505	25,931	33,230	29,452	38,087	46,501
Depreciation	3,995	3,995	3,995	5,999	5,999	5,999
Total farm expenses	22,361	27,208	32,185	35,521	41,632	47,960
Net Farm Income	14,510	21,936	29,235	23,453	32,088	40,502
Total interest charges	16,134	19,969	23,806	26,003	30,610	35,220
Return to Operator's Labor and Management	—1,624	1,967	5,429	—2,550	1,478	5,282

Table 6. Costs per Acre of Cropland by Size of Farm, Moldboard Fallow Operation[1]

Costs	Small			Medium			Medium-large			Large		
	400 acres	700 acres	1,000 acres	800 acres	1,200 acres	1,600 acres	1,500 acres	2,000 acres	2,500 acres	2,400 acres	3,000 acres	3,600 acres
Cash operating costs	$ 7.92	$ 7.57	$ 7.44	$ 7.35	$ 7.08	$ 6.96	$ 7.78	$ 7.57	$ 7.48	$ 7.74	$ 7.63	$ 7.60
Cash overhead costs	4.53	3.66	3.34	4.43	3.81	3.50	4.46	4.04	3.80	4.56	4.25	4.05
Total cash costs	12.45	11.23	10.79	11.78	10.89	10.46	12.24	11.61	11.28	12.30	11.88	11.65
Total farm expenses	15.66	13.07	12.07	14.33	12.59	11.74	14.91	13.60	12.87	14.80	13.88	13.32
Interest	10.58	9.33	8.83	10.98	9.87	9.32	10.76	9.98	9.52	10.83	10.20	9.78

[1] To obtain comparable costs per acre of cropland harvested, the above costs should be multiplied by two.

example, on the 1,600-acre farm in the medium size group, net farm income amounts to about $20,500. The net farm income from the 3,600-acre large farm is approximately $40,500, about $5,000 less than it would be with the same per-acre expenses as on the 1,600-acre farm. Per-acre expenses on the 3,600-acre farm are nearly $1.70 higher than on the 1,600-acre farm, while gross income per acre remains the same.

When interest on capital invested is subtracted from net farm income, the residual figure is the operator's return for labor and management. The 1,600-acre farm of the medium size group has the largest return for labor and management. It would appear that there are slight diseconomies to size for the two and three tractor outfits under the organization and investment conditions assumed. As was pointed out earlier, investment on a per-acre basis is larger for these size groups than for the small and medium size groups. It should also be noted that capital is the main input marketed on the larger farms. As a result, the net farm income may be quite substantial, even though returns to the operator for his labor and management are relatively less.

Of course, not all of the capital used is necessarily owned by the operator, as is assumed in these calculations.

In practice, some of the land may be rented or some of the capital may be borrowed. The 3,600-acre farm might be used as an example. Total capital requirement for this farm is approximately $668,000. If half of this were borrowed at the interest rate assumed, net farm income would be reduced from $40,502 to about $22,892, since the interest charge becomes a cost of operation. This would be a sizable return to the operator for his labor, management, and capital. Under existing price relationships, however, he would be almost as well off to reduce his indebtedness and operate a 1,600-acre farm. If price relationships were to improve, he would stand to gain much more with the larger farm. Profitable adjustments, however, need not always involve an increase in acreage.

In interpreting the return to labor and management, it should be understood that it is the residual after allowing a return to capital. The interest charge on capital investment is necessarily an arbitrary figure. Five percent was used for the land and building investment, 6% for the machinery and equipment investment, and 7% for working capital. In view of current interest rates, these charges may seem low. However, not all of the current investment in the Columbia Basin was financed at current rates. Also, it is possible that assumed land values could not be realized on any large scale on the current real estate market. If the reader wishes to use other rates, he can test the effect this would have on the operator's return for labor and management.

Table 7. Income and Expense Budgets by Size of Farm and Acreage of Cropland, Stubble Mulch Fallow Operation

Item	Small			Medium		
	400 acres	700 acres	1,000 acres	800 acres	1,200 acres	1,600 acres
Gross Farm Income	$ 8,654	$15,156	$21,636	$17,309	$25,964	$34,620
Cash operating costs	3,158	5,153	7,170	5,863	8,351	10,852
Cash overhead costs	1,627	2,223	2,836	3,164	3,977	4,802
Total cash costs	4,785	7,376	10,006	9,027	12,328	15,654
Cash Farm Income	3,869	7,780	11,630	8,282	13,636	18,966
Depreciation	1,402	1,402	1,402	2,219	2,219	2,219
Total farm expenses	6,187	8,778	11,408	11,246	14,547	17,873
Net Farm Income	2,467	6,378	10,228	6,063	11,417	16,747
Total interest charges	3,684	5,454	7,225	7,607	9,965	12,323
Return to Operator's Labor and Management	—1,217	924	3,003	—1,544	1,452	4,424

Item	Medium-large			Large		
	1,500 acres	2,000 acres	2,500 acres	2,400 acres	3,000 acres	3,600 acres
Gross Farm Income	$32,465	$43,272	$54,081	$51,929	$64,912	$77,891
Cash operating costs	11,546	14,914	18,365	18,721	22,950	27,177
Cash overhead costs	5,977	7,124	8,271	9,881	11,394	12,925
Total cash costs	17,523	22,038	26,636	28,602	34,344	40,102
Cash Farm Income	14,942	21,234	27,445	23,327	30,568	37,789
Depreciation	4,242	4,242	4,242	6,367	6,367	6,367
Total farm expenses	21,765	26,280	30,878	34,969	40,711	46,469
Net Farm Income	10,700	16,992	23,203	16,960	24,201	31,422
Total interest charges	13,825	16,779	19,734	22,288	25,838	29,389
Return to Operator's Labor and Management	—3,125	213	3,469	—5,328	—1,637	2,033

Table 8. Per-Acre Costs by Acreage Within Size Groups for Stubble Mulch Operation[1]

Costs	Small			Medium			Medium-large			Large		
	400 acres	700 acres	1,000 acres	800 acres	1,200 acres	1,600 acres	1,500 acres	2,000 acres	2,500 acres	2,400 acres	3,000 acres	3,600 acres
Cash operating costs	$ 7.90	$ 7.36	$ 7.17	$ 7.33	$ 6.96	$ 6.78	$ 7.70	$ 7.46	$ 7.35	$ 7.80	$ 7.65	$ 7.55
Cash overhead costs	4.07	3.18	2.84	3.96	3.31	3.00	3.98	3.56	3.31	4.12	3.80	3.59
Total cash costs	11.97	10.54	10.01	11.29	10.27	9.78	11.68	11.02	10.66	11.92	11.45	11.14
Total farm expenses	15.47	12.54	11.41	14.06	12.12	11.17	14.51	13.14	12.35	14.57	13.57	12.91
Interest	9.21	7.79	7.23	9.51	8.30	7.70	9.22	8.39	7.89	9.29	8.61	8.16

[1] To obtain comparable costs per acre of cropland harvested, the above costs should be multiplied by two.

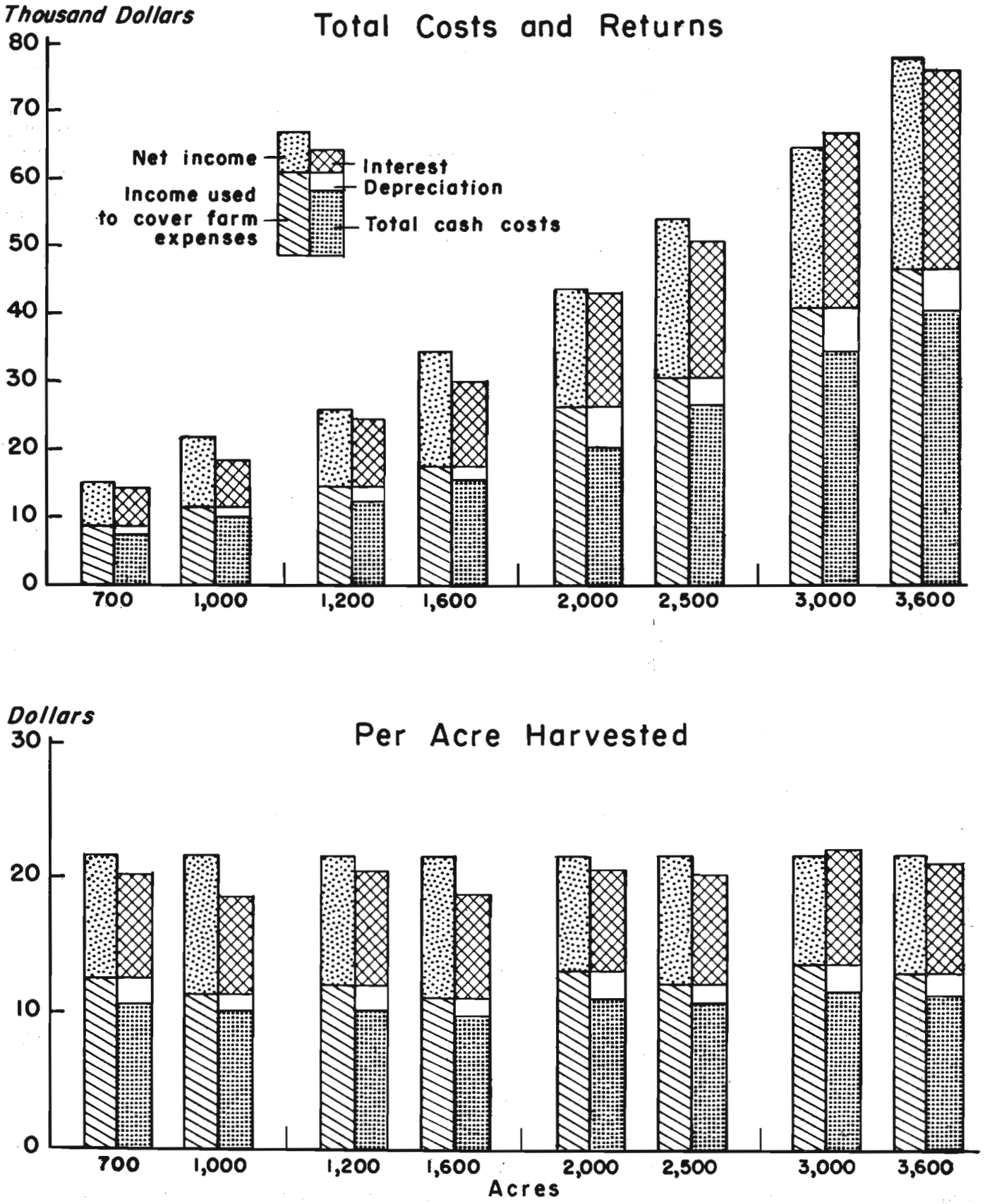

FIGURE 1. Cost and return data for selected acreages, moldboard fallow operations.

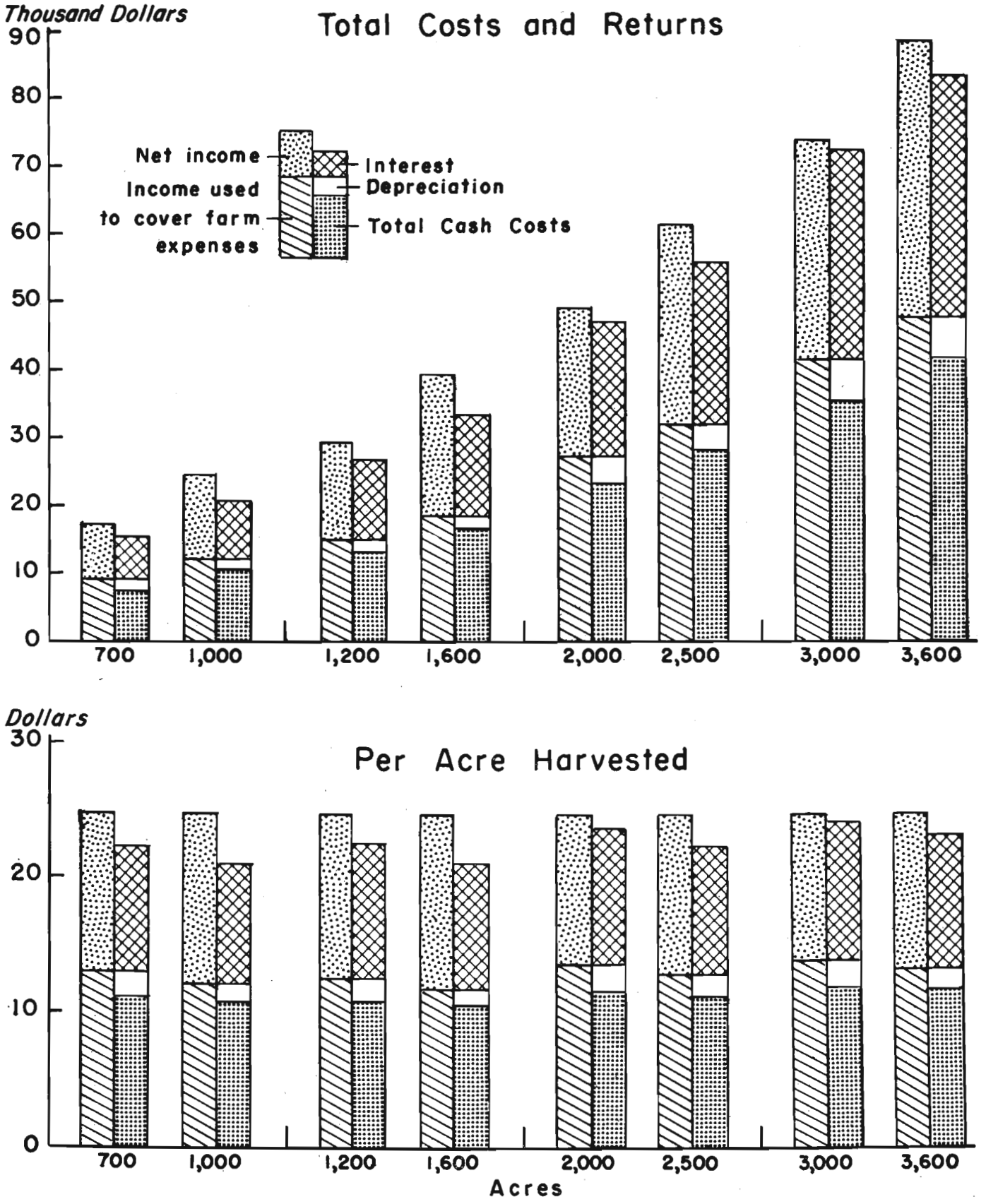

FIGURE 2. Cost and return data for selected acreages, stubble mulch operations.

Total and per-acre cost and return relationships for moldboard fallow farms are illustrated in Figure 1. The smallest farm of each size group is omitted from the illustration. The reason for the omission is that, except for the 400-acre farm, a more efficient machinery combination would be available to farm these particular acreages.

There are two bars for each farm size in Figure 1. The bar on the left is divided into two portions with the height of the bar representing gross income. The lower portion of the bar represents that part of gross income needed to cover total farm expenses. The remaining or upper portion corresponds to the net farm income. The bar on the right represents the various groups of cost items. The extent to which the total height of this bar is less than that of the bar on the left represents the return to labor and management.

Stubble Mulch Fallow System

Budgets for stubble mulch fallow farms show income and cost relationships quite similar to those for moldboard fallow farms. Information on income and costs is presented in Tables 7 and 8 and in Figure 2. Because of lower yields, the gross income is not as favorable as for the moldboard fallow operations. For 3,600-acre farms in the large size group, gross income per acre of cropland is $24.57 on moldboard fallow farms as compared with $21.64 on stubble mulch fallow farms. However, costs are somewhat lower on stubble mulch fallow despite the fact that machinery investment is slightly greater. The lower per-acre costs on stubble mulch fallow farms are due to a number of factors. Fertilization rates are somewhat lower on the lighter soils and fertilizer is a significant expense. Certain other costs that are a result of yield, such as hauling and crop insurance, are, of course, lower. Property taxes are lower because of the lower land values. Since the investment is less, the interest charge is less. However, the lower costs are more than offset by lower gross income.

It would be incorrect to conclude that the stubble mulch practice is the cause of the difference in yield and consequently the difference in income. It was pointed out earlier that this practice was adopted first on the less productive soils. Experimental evidence indicates that, on comparable soils, yields on moldboard and stubble mulch fallow tend to be about the same after stubble mulch has been practiced for a number of years. Stubble mulch, however, requires somewhat heavier fertilization and a slightly higher machinery inventory. Therefore, on comparable land, the income difference between the two cultural practices would be less than is indicated by the budgets. Stubble mulch, of course, is superior from a conservation standpoint. On those soils that are subject to erosion, it is undoubtedly a profitable practice over a period of time.

Additional Considerations

In addition to the observations made above, the budgets warrant the drawing of certain other conclusions. One of the most significant facts brought out by the budgets is the importance of having the proper combination of acreage and machinery. Within each size group, costs declined as acreage increased. This was due to spreading certain fixed costs over a larger acreage. The largest acreage in each size group was selected to utilize the machinery as adequately as possible. The results demonstrate the importance of adequate utilization of machinery. Many farmers recognize this and compete for the acquisition of land on both an ownership and a rental basis when their machinery is not used to capacity. They realize that if their machinery is not fully utilized, costs per acre may be decreased by an increase in acreage farmed.

When machinery inventory is fully utilized, increasing the acreage will require additional power and equipment. Adding another tractor or replacing the existing tractor with a larger one and adjusting the rest of the machinery inventory accordingly is necessary. This is equivalent to moving from one size group to another in the budgets. On the basis of the budgets, it can be said that a substantial acreage should be added if comparable efficiency is to be obtained. For example, the 2,500-acre farm in the medium-large size group has a greater return to labor and management than the 3,000-acre farm in the large size group, which despite its greater crop acreage is inadequate to fully utilize the larger machinery, equipment, and building inventory assumed. The 1,600-acre medium farm has about the same net farm income as the 2,000-acre medium-large farm, but it has a greater return to labor and management.

In deciding whether to move to a larger size group, the capital position of the farmer is important. If the farmer has capital he wishes to invest, the larger farm may yield him a return on his additional investment. However, if he must go heavily in debt in order to expand, he may add very little to his income under present price relationships. If existing price relationships should improve, larger farms would prove relatively more profitable than smaller ones.

Another significant conclusion to be drawn from the budgets is that per-acre costs are rather uniform for all size groups. On a per-acre basis, the largest farms (in terms of crop acreage) in each of the size groups have quite comparable costs. Although the trend is toward larger farms, the main impetus for this is the larger net farm income that results from a greater number of acres rather than greater efficiency on a per-acre basis. The efficient farmer who operates at least 700 to 800 acres and is not in debt can produce as efficiently as farmers of larger acreages. The substantial difference in net farm income received is largely a result of returns on a much larger investment.

The Effect of Price and Yield Variability on Income

Price Variability

Before the advent of price-support operations, wheat prices were highly unstable. At present, wheat and barley prices are much influenced by price supports. Consequently, price-support levels are of considerable interest to the wheat farmer.

Table 9 was prepared to demonstrate the responsiveness of net farm income to changes in price of products assuming no change in cost rates. A 10% change in farm product prices will result in changes in net farm income ranging from 18 to 22% on moldboard fallow farms. Net farm incomes on stubble mulch fallow farms are somewhat more responsive, varying from 20 to 25% with a 10% change in prices. The reason for this greater relative change in income is that costs are affected little by changes in prices of products. When farm expenses require a substantial portion of the gross farm income, net farm income is obviously quite responsive to price changes.

Table 9. Percentage Change in Net Farm Income Associated With a Ten Percent Change in Price of Farm Products, Selected Moldboard Fallow and Stubble Mulch Fallow Farms

Size group and cropland acreage	Moldboard fallow	Stubble mulch fallow
	% change	% change
Small		
700	20	23
1,000	19	20
Medium		
1,200	20	22
1,600	18	20
Medium-large		
2,000	21	24
2,500	20	22
Large		
3,000	22	25
3,600	21	23

Despite the fact that net farm income is sensitive to price changes, the amount of wheat produced would not be highly responsive to price changes because wheat prices would need to decline substantially before other crops would be more profitable on these specialized farms. Data used in this study suggest that, with wheat yielding 32 bushels per acre and barley 40 bushels, the price of wheat would need to fall to less than $1.10 per bushel before wheat would be less profitable than barley at $0.87 per bushel. With wheat at $1.79 per bushel and the above yield relationships, barley would be more profitable than wheat only if the price of barley exceeded $1.45 per bushel. Similar relationships would hold for the stubble mulch fallow operations.

Yield Variability

Net farm income is responsive to changes in yields as well as in prices. Expenses do not change proportionately with yields to the extent that gross income changes. A change in per-acre yields will change certain costs such as harvesting, hauling, and insurance, but it will not affect most of the other farm cost items. With the land use assumed in the budgets, a 1-bushel per acre change in wheat and barley yields will affect net farm income by about $0.70 per cropland acre. On a percentage basis, a 1% change in crop yields will change net farm income by about twice that amount, or approximately 2%. As is shown in Table 10, these relationships will vary with size of farm and cultural practice.

Table 10. Percentage Change in Net Farm Income Associated with a One-Bushel Change in Yield of All Crops, Selected Moldboard Fallow and Stubble Mulch Fallow Farms[1]

Size group and cropland acreage	Moldboard fallow	Stubble mulch fallow
	% change	% change
Small		
700	6.0	7.6
1,000	5.5	6.8
Medium		
1,200	5.8	7.4
1,600	5.4	6.7
Medium-large		
2,000	6.4	8.2
2,500	6.0	7.5
Large		
3,000	6.5	8.7
3,600	6.2	8.0

[1] Percentage yield change is about 3.3 percent.

The responsiveness of net farm income to changes in yield suggests the importance of those management practices that affect yields. Proper seedbed preparation, weed control, and fertilization are all practices that return more in income than they add to costs. The growing of proper varieties will also affect yields considerably while adding very little, if any, to costs.

Appendix A

Machinery and Equipment Inventories

Moldboard Fallow Operation

	Small farms			Medium farms		
Equipment	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour
Tractor	30-40 DBHP Crawler	$ 5,000 u		50-60 DBHP Crawler	$15,000 n	
Plow, moldboard	2-3 bot.-16"	600 u	2.5	2-5 bot.-16"	2,000 n	4.5
Springtooth	7-4′ sec.	350 n	7.0	9-5′ sec.	450 n	10.0
Disk	2-10′	800 n	6.0	3-10′	1,200 n	8.5
Rodweeder	3-12′	450 u	9.5	4-12′ center-drive	1,400 n	12.0
Spiketooth	8-4½′ sec.	215 n	10.0	14-4½′ sec.	350 n	16.0
Drill	2-10′ (disk)	400 u	4.8	4-10′ (disk)	2,000 n	9.0
Rotary hoe						
Spray rig	1-20′	200 u	6.0	1-20′	300 n	6.0
Combine	1-16′ pull type	1,500 u	3.5	1-20′ pull type	6,000 n	5.0
Truck	1-1½ ton	4,000 n		1-1½ ton	4,000 n	
	1-1½ ton (utility)	800 u		1-1½ ton	1,500 u	
	1-pickup	1,500 u		1-1½ ton (utility)	800 u	
				1-pickup	2,400 n	
Hitches		300			600	
Shop equipment		700			1,000	
Total		$16,815			$39,000	

Machinery and Equipment Inventories

Moldboard Fallow Operations

	Medium-large farms			Large farms		
Equipment	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour
Tractor	50-60 DBHP Crawler	$15,000 n		50-60 DBHP Crawler	$15,000 n	
	30-40 DBHP Crawler	5,000 u		50-60 DBHP Crawler	15,000 n	
				25-35 DBHP Crawler or Wh.	6,000 n	
Plow, moldboard	2-3 bot.-16″	1,200 n	2.5	2-6 bot.-16″	2,200 n	5.5
	2-5 bot.-16″	2,000 n	4.5	2-6 bot.-16″	2,200 n	5.5
Springtooth	9-5′ sec.	450 n	10.0	9-5′ sec.	450 n	10.0
	6-5′ sec.	350 n	7.0	9-5′ sec.	450 n	10.0
Disk	3-10′	1,200 n	8.5	3-10′	1,200 n	8.5
Rodweeder	4-12′ center-drive	1,400 n	12.0	4-12′ center-drive	1,400 n	12.0
	3-12′ center-drive	1,100 n	9.5	4-12′ center-drive	1,400 n	12.0
Spiketooth	14-4½′ sec.	350 n	16.0	14-4½′ sec.	350 n	16.0
Drill	4-12′ (disk)	2,400 n	11.0	4-12′ (disk)	2,400 n	11.0
	2-10′ (disk)	1,000 n	4.8	4-12′ (disk)	2,400 n	11.0
Rotary hoe	8-3½′ sec.	900 n	8.5	10-3½′ sec.	1,200 n	12.0
Spray rig	1-30′	400 n	12.0	1-50′	600 n	18.0
Combine	1-16′ self propelled	15,000 n	3.5	1-16′ self propelled	15,000 n	3.5
	1-20′ pull type	2,000 u	5.0	1-16′ self propelled	15,000 n	3.5
				1-20′ pull type	2,000 u	5.0
Truck	1-2 ton dump	4,800 n		1-2 ton dump	4,800 n	
	1-2 ton	4,500 n		1-2 ton dump	4,800 n	
	1-1½ ton	1,500 u		1-2 ton	4,500 n	
	1-1½ ton (utility)	800 n		1-1½ ton (utility)	1,500 u	
	1-pickup	2,400 n		1-1½ ton (utility)	1,500 u	
				2-pickup	4,800 n	
Hitches		900			1,500	
Shop equipment		1,400			2,000	
Total		$66,050			$109,650	

Machinery and Equipment Inventories

Stubble Mulch Fallow Operation

Equipment	Small farms			Medium farms		
	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour
Tractor	1-30-40 DBHP Crawler	$ 5,000 u		1-50-60 DBHP Crawler	$15,000 n	
Plow	2-3 bot.-16"	600 u	2.5	2-5 bot.-16"	2,000 n	4.5
Sweep	1-16′	600 u	4.0	1-24′	1,400 n	6.0
Springtooth	7-4′ sec.	350 n	7.0	9-5′ sec.	450 n	10.0
Disk	2-10′	800 n	6.0	3-10′	1,200 n	8.5
Rodweeder	3-12′	450 u	9.5	4-12′ center-drive	1,400 n	12.0
Spiketooth	8-4½′ sec.	215 n	10.0	14-4½′ sec.	350 n	16.0
Drill	2-12′ (deep furrow)	2,400 n	5.5	3-12′ (deep furrow)	3,600 n	9.0
Rotary hoe				8-3½′ sec.	900 n	8.5
Spray rig	1-20′	200 u	6.0	1-20′	300 n	6.0
Combine	1-16′ pull type	1,500 u	3.5	1-20′ pull type	6,000 n	5.0
Truck	1-1½ ton	4,000 n		1-1½ ton	4,000 n	
	1-1½ ton (utility)	800 u		1-1½ ton	1,500 u	
	1-pickup	1,500 u		1-1½ ton (utility)	800 u	
				1-pickup	2,400 n	
Hitches		300			600	
Shop equipment		700			1,000	
Total		$19,415			$42,900	

Machinery and Equipment Inventories

Stubble Mulch Fallow Operation

Equipment	Medium-large farms			Large farms		
	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour	Number, type, and size	Purchase price n (new) u (used)	Rate of perform. acres per hour
Tractor	1-50-60 DBHP Crawler	$15,000 n		1-50-60 DBHP Crawler	$15,000 n	
	1-30-40 DBHP Crawler	5,000 u		1-50-60 DBHP Crawler	15,000 n	
				1-25-35 DBHP Crawler or Wh.	5,000 n	
Plow	2-5 bot.-16″	2,000 n	4.5	2-6 bot.-16″	2,200 n	5.5
				2-5 bot.-16″	2,000 n	4.5
Sweep	1-24′	1,400 n	6.0	1-24′	1,400 n	6.0
	1-16′	1,000 n	4.0	1-24′	1,400 n	6.0
Springtooth	9-5′ sec.	450 n	10.0	9-5′ sec.	450 n	10.0
	6-5′ sec	350 n	7.0	9-5′ sec.	450 n	10.0
Disk	3-10′	1,200 n	8.5	3-10′	1,200 n	8.5
Rodweeder	4-12′ center-drive	1,400 n	12.0	4-12′ center-drive	1,400 n	12.0
	3-12′ center-drive	1,100 n	9.5	4-12′ center-drive	1,400 n	12.0
Spiketooth	14-4½′ sec.	350 n	16.0	14-4½′ sec.	350 n	16.0
Drill	4-12′ (deep furrow)	5,000 n	11.0	4-12′ (deep furrow)	5,000 n	11.0
	2-12′ (deep furrow)	2,400 n	5.5	4-12′ (deep furrow)	5,000 n	11.0
Rotary hoe	10-3½′ sec.	1,200 n	12.0	10-3½′ sec.	1,200 n	12.0
Spray rig	1-30′	400 n	12.0	1-50′	600 n	18.0
Combine	1-16′ self propelled	15,000 n	3.5	1-16′ self propelled	15,000 n	3.5
	1-20′ pull type	2,000 u	5.0	1-16′ self propelled	15,000 n	3.5
				1-20′ pull type	2,000 u	5.0
Truck	1-2 ton dump	4,800 n		1-2 ton dump	4,800 n	
	1-2 ton	4,500 n		1-2 ton dump	4,800 n	
	1-1½ ton	1,500 u		1-2 ton	4,500 n	
	1-1½ ton (utility)	800 u		1-1½ ton (utility)	1,500 u	
	1 pickup	2,400 n		1-1½ ton (utility)	1,500 u	
				2 pickup	4,800 n	
Hitches		900			1,500	
Shop equipment		1,400			2,000	
Total		$71,550			$116,450	

Appendix B

Field Operations for Moldboard and Stubble Mulch Fallow Practices

Moldboard Fallow

1. Moldboard plowing: One-half of cropland each year.
2. Springtooth harrowing: All of summerfallowed land twice and land planted to spring barley once in the spring.
3. Rodweeding: All of summerfallowed land twice and land planted to spring barley once in the spring.
4. Fertilizing: All of land in crops is fertilized once (one-half of total cropland).
5. Seeding: All land available for crops is seeded and 25% of the acreage seeded to winter barley is reseeded in the spring.
6. Spraying: All wheat and winter barley for harvest is sprayed.
7. Combining: All land in crops is harvested (one-half of total cropland).

Stubble Mulch Fallow

1. Sweep plowing: All of summerfallowed land twice.
2. Rotary hoe or rodweeding: All summerfallowed land once.
3. Rodweeding: All summerfallowed land twice.
4. Springtooth harrowing: All land planted to spring barley once in the spring.
5. Spiketooth harrowing: Same as springtooth harrowing.
6. Fertilizing: Same as moldboard fallow.
7. Seeding: Same as moldboard fallow.
8. Spraying: Same as moldboard fallow.
9. Combining: Same as moldboard fallow.

Appendix C

Basis for Cost Calculations

In the material that follows, the basis is given for each of the cost items used in the budgets. Furthermore, each item is illustrated by making the necessary calculations for the 1,600-acre moldboard fallow farm. By referring to Appendix D, the individual cost items can be identified.

1. **Seed:**

Crop	Rate: Clean (lbs./a.)	Rate: Uncleaned (lbs./a.)	Price ($/bu.)	Cleaning and treating ($/bu.)	Total costs ($/a.)
Wheat	40	60	$1.79	$ .20	$1.99
W. barley	45	65	.87	.20	1.45
S. barley	60	85	.87	.20	1.89

For 1,600-acre moldboard fallow farm:

Crop	Acreage	Seed cost
Wheat	520	$1,035
W. barley	210	304
S. barley	122	231
		$1,570

2. **Fertilizer material:**

Crop	Rate (lbs./a.)	Price ($/lb.)	Total costs ($/acre)
Wheat, moldboard fallow	40 N	$ .12	$4.80
Wheat, stubble mulch	35 N	.12	4.20
Barley, moldboard fallow	35 N	.12	4.20
Barley, stubble mulch	30 N	.12	3.60

For 1,600-acre moldboard fallow farm:

Crop	Acreage	Fertilizer cost
Wheat	520	$2,496
Barley	280	1,176
		$3,672

3. **Fuel, oil, and grease:**

Equipment	Total cost ($/hr.)
25-35 H.P. tractor	$ .51
30-40 H.P. tractor	.67
50-60 H.P. tractor	.96
16′ Pull-type combine	.88
20′ Pull-type combine	.94
16′ Self-propelled combine	1.04

For 1,600-acre moldboard fallow farm:

Operation	Hrs. of use[1]	Rate ($/hr.)	Total cost
Field work (with 50-60 H.P. tractor)	828	$ .96	$795
Combining (with 20′ pull-type combine)	160	.94	150
			$945

[1] Acreage worked divided by rate per hour (from Appendix A) for each field operation (from Appendix B).

4. **Repairs and maintenance:**

a. Tractors and combines:

	Cost per hour of use: New	Old or used
25-35 H.P. tractor	$ .55	
30-40 H.P. tractor	.75	$1.05
50-60 H.P. tractor	.95	
16′ Pull-type combine	2.25	3.50
20′ Pull-type combine	2.75	4.00
16′ Self-propelled combine	2.50	

b. Trucks:
Repairs and maintenance costs are included in the cost per mile operated.

c. Other equipment:
6.5% of purchase price per year.

For 1,600-acre moldboard fallow farm:

Equipment	Hrs. of use	Rate ($/hr.)	Cost
Tractor (new 50-60 H.P.)	828	$ .95	$ 787
Combine (new 20′ pull-type)	160	2.75	440
Other equipment—6.5% of purchase price, i.e., $9,300			604
			$1,831

5. **Hired labor for field work:**

A wage rate of $15 per 10-hour day was used for all field work except operating a combine. Combine operators received $25 per day. After hourly labor requirements were calculated for each field operation, a 10% allowance was made for traveling to and from the farmstead and servicing the equipment.

For small, medium, and medium-large farms, it was assumed that the operator would work full time in the field and would operate a combine during harvest. For large farms, it was assumed that the operator would need to spend full time in a supervisory capacity.

Labor for hauling during harvest was included in hauling costs.

For 1,600-acre moldboard fallow farm:

Hired labor hours for field work during harvest: 176 hours, i.e., 18 days @ $15 per day = $270.

6. **Spraying weeds:**

It was assumed that on the small and medium farms spraying was hired on a custom basis at $1.70 per acre, including materials. On the medium-large and large farms, the operator did some of his own spraying. Spray material costs are $0.75 per acre. The total wheat and winter barley acreage for harvest are sprayed.

For 1,600-acre moldboard fallow farm:

Total wheat and winter barley for harvest = 678 acres.

Spraying costs at $1.70 per acre = $1,153.

7. **Crop insurance:**

Fire: $0.30 per $100 value of both wheat and barley.
Hail: $1.75 per $100 value of wheat.
$2.50 per $100 value of barley.

It was assumed that all operators carried fire insurance but that only half of the land in crops was insured against hail damage.

For 1,600-acre moldboard fallow farm:

Fire: $39,317 @ $0.30 per $100	= $118
Hail: Wheat, $14,893 @ $1.75 per $100	= 261
Barley, $4,766 @ $2.50 per $100	= 119
	$498

8. **Hauling costs:**

Truck capacity:
1½-ton truck, 200 bushels.
2-ton truck, 250 bushels.

Grain trucks:
During harvest all grain would be hauled to storage over a distance of 10 miles, making a round trip of 20 miles.

Pickup trucks:
It was assumed that the pickup would be driven twice daily from the farmstead to the field during field work. The distance was estimated as follows:

	Miles to field	Daily mileage during field work
Small farm	3	12
Medium farm	4	16
Medium-large farm	5	20
Large farm	6	24

In addition, it was assumed that for every acre of cropland the pickup would be driven 3 miles during the year.

Utility trucks:

It was assumed that the utility truck hauling fuel and supplies to the field during field operations would make one round trip from farmstead to field per day.

Fuel, oil, grease, and repair costs:

Type and size of truck	Cost per mile
1½-ton truck	$ .07
2-ton truck	.08
Pickup	.05
Utility	.07

Labor for hauling:

It was assumed that one man would be hired on the small and medium size farms to haul grain during harvest. Two men would be required on the medium-large farm and three men on the large farm. The wage rate used was the same as for field work excluding combining, $15 per day.

For 1,600-acre moldboard fallow farm:

Truck	Grain hauling mileage	Other field operations	Overhead mileage	Total mileage	Operating cost	Labor cost	Total hauling cost
1½-ton	2,760	——	——	2,760	$193	$540	$ 733
Utility	——	664	——	664	46		46
Pickup	——	1,328	4,800	6,128	306		306
							$1,085

9. **Miscellaneous costs including supplies:**

An allowance for miscellaneous minor costs of 1% for all cash operating costs was made.

For 1,600-acre moldboard fallow farm:

Total cash operating costs excluding miscellaneous and supplies = $11,024.

One percent of $11,024 = $110.

10. **Real property taxes:**

Sixty mills was charged for real estate taxes on one-fourth of the appraised value of the land and on half of the inventory value of buildings. Moldboard fallow land yielding 32 bushels per acre was valued at $150 per acre.

Stubble mulch fallow land yielding 28 bushels per acre was valued at $115 per acre. The appraised value of farm buildings equals half of the inventory value.

For 1,600-acre moldboard fallow farm:

Appraised value:

Land	$240,000 ÷ 4 =	$60,000
Buildings	$ 5,500 ÷ 2 =	$ 2,750
		$62,750

$62,750 @ $0.06 = $3,765.

11. **Personal property taxes:**

The tax rate was estimated at 1% of the inventory value; the inventory value equals half the purchase price.

For 1,600-acre moldboard fallow farm:

Inventory value of personal property = $39,000 ÷ 2 = $19,500.

One percent of $19,500 = $195.

12. **Farm premises and building insurance:**

Farm premises liability:

$25 per year for the first section.

$2.20 per year for each additional section or fraction.

Fire:

$7.50 per $1,000 value on all farms.

Grain storage, including stored grain:

$1 per $100 of value.

Small farms: $500 value plus value of seed.

Medium farms: $1,000 value plus value of seed.

Medium-large farms: $2,000 value plus value of seed.

Large farms: $3,000 value plus value of seed.

For 1,600-acre moldboard fallow farm:

a. Farm premises liability =	$29.40
b. Fire	41.25
c. Grain storage	20.94
	$91.59

13. **Equipment insurance:**

Trucks:

(1) Public liability and property damage

Small farm—1 pickup and one 1½-ton $ 80 per year

Medium farm—1 pickup and two 1½-ton $115 per year

Medium-large farm—1 pickup; two 2-ton and one 1½-ton $150 per year

Large farm—2 pickups, and three 2-ton $170 per year

(2) Comprehensive

$45 per year per vehicle listed above.

(3) Medical expense

$5 per $500 coverage per year per vehicle.

Tractors and combines:

All risk (fire, theft, and upset) $0.75 per $100 of value per year.

All other equipment:

All risk (fire, theft, and upset) $0.50 per $100 of value per year.

For 1,600-acre moldboard fallow farm:

(a) Trucks	
(1) Public liability	$115.00
(2) Comprehensive	135.00
(3) Medical expense	15.00
(b) Tractors and combines	157.50
(c) All other equipment	46.50
	$469.00

14. **Building repair:**

2% of inventory value.

For 1,600-acre moldboard fallow farm:

2% of inventory value ($5,500) = $110.

15. **Overhead hired labor:**

50% of the hours of labor hired for field work and hauling times $15 per day.

For 1,600-acre moldboard fallow farm:

Labor hired for field work and hauling = 531 hours.

531 ÷ 2 = 266 hours = 27 days @ $15 = $405.

16. **Workmen's compensation:**

$8 per $100 of wages paid.

For 1,600-acre moldboard fallow farm:

Total wage bill = $1,215.

$8 per $100 on $1,215 = $97.

17. **Farm share of family automobile:**

A cost of $0.08 per mile for the following mileages:

Small	Medium	Medium-large	Large
2,000	4,000	6,000	8,000

For 1,600-acre moldboard fallow farm:

4,000 miles @ $0.08 per mile = $320.

18. **Licenses, telephone, and office expenses:**

The following annual costs were assumed by size of farm:

	Small	Medium	Med.-large	Large
Motor vehicle licenses	$ 25.00	$ 40.00	$ 45.00	$ 72.50
Telephone	24.00	36.00	60.00	84.00
Office expenses	51.00	74.00	120.00	168.50
Total	$100.00	$150.00	$225.00	$325.00

For 1,600-acre moldboard fallow farm:

Motor vehicle licenses	$40.00
Telephone	36.00
Office expenses	74.00
	$150.00

19. **Building depreciation:**

The inventory value was depreciated on a straight-line basis over 30 years.

For 1,600-acre moldboard fallow farm:

$5,500 ÷ 30 = $183.

20. **Equipment depreciation (straight-line basis):**

Tractors and combines:

	Years of life	Salvage value
New	18	10%
Used	8	10%

All other equipment:

Estimated life of 20 years; scrap value 10%.

For 1,600-acre moldboard fallow farm:

Tractors	$15,000 (new)	less $1,500 ÷ 18 =	$ 750
Combines	6,000 (new)	less $ 600 ÷ 18 =	300
Others	18,000	less $1,800 ÷ 20 =	810
			$1,860

21. **Interest on land and buildings:**

5% of appraised value.

For 1,600-acre moldboard fallow farm:

$245,500 @ $0.05 = $12,275.

22. **Interest on equipment:**

6% of inventory value.

For 1,600-acre moldboard fallow farm:

$39,000 @ $0.06 = $2,340.

23. **Interest on working capital:**

7% on half of total cash costs for 6 months.

For 1,600-acre moldboard fallow farm:

Total cash costs = $16,737.

50% of $16,737 i.e., $8,369 @ 3.5% = $293.

Appendix D

Farm Budget Sample[1]

	1,600-acre moldboard fallow farm	Situation A	Situation B
Income			
Wheat	$29,786		
Barley, fall	5,498		
Barley, spring	4,033		
A. Gross fall income	39,317		
Expenses			
1.[2] Seed	1,570		
2. Fertilizer	3,672		
3. Fuel, oil, grease	945		
4. Repairs and maintenance of machinery	1,831		
5. Hired labor-field operations	270		
6. Spraying weeds	1,153		
7. Crop insurance	498		
8. Hauling (labor and truck operation)	1,085		
9. Miscellaneous (1% of 1 to 8)	110		
B. Total cash operating costs (1 to 9)	11,134		
10. Real property taxes	3,765		
11. Personal property taxes	195		
12. Building insurance	92		
13. Equipment insurance	469		
14. Building repairs	110		
15. Overhead hired labor	405		
16. Workmen's compensation	97		
17. Farm share auto	320		
18. Licenses, telephone, and office	150		
C. Total cash overhead (10 to 18)	5,603		
D. Cash farm income (A-(B and C))	22,580		
19. Building depreciation	183		
20. Equipment depreciation	1,860		
E. Total depreciation (19 and 20)	2,043		
F. Total farm expenses (B and C and E)	18,780		
G. Net farm income (D - E)	20,537		
21. Interest on land and buildings	12.275		
22. Interest on machinery	2,340		
23. Interest on working capital	293		
H. Total interest (21 to 23)	14,908		
I. Returns to labor and management (G - H)	5,629		

[1] It was mentioned in the text that the budgets may not apply to individual farm situations. For the convenience of the farmer who wishes to analyze his own situation, blank budget forms are provided. For comparative and illustrative purposes, the 1,600-acre moldboard fallow medium-size farm budget is presented with two blank columns for farmer's use. The basis for each of the individual cost items for the 1,600-acre farm is given in Appendix C.

[2] Numbers refer to cost items in Appendix C.