

OHIO FARM HOUSEHOLD LONGITUDINAL STUDY:

1986 SUMMARY RESULTS

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OHIO FARM HOUSEHOLD FINANCIAL CONDITION  
January 1, 1987

Financial stress among U.S. farm families has been much discussed in the news in recent years. What the actual economic and social circumstances are among farm families is widely debated. Often one finds comparisons to the Great Depression. Then one sees declarations that there is no 'farm problem', that bankruptcies are confined to a speculative few and are not representative of the broader agricultural whole. During the winter and early spring of 1987, nearly 1000 Ohio farm operator households were randomly selected and interviewed extensively by telephone to determine some of the facts which should resolve debate and promote a more focused understanding. This is the first in a series of brief reports which summarize some of the things that were learned.

Two prefatory remarks are appropriate: First, these sampled households were selected with the intention that they would represent the larger population. Statistical tests show that they do. We are not talking, therefore, only about 1000 Ohio farm families; we are talking about things that apply as well to the much larger population of farm homes nationwide. Second, national averages do not tell nearly as much about what has been going on as do the variations within the data that produced those averages. Perhaps some of the dismissals of agriculture and its 'problems' have been based on a knowledge of the averages and an ignorance of the importance and implications of some of the variations.

An example will illustrate: In this country what we call 'farms' is what the census calls them. When the census says there are 2.3 million farms they mean 2.3 million places that ordinarily sell \$1000 or more annually in farm products. That's not very much--a couple calves, maybe, or some sweet corn in July, or maybe a little pick-your-own strawberry patch. Most of us have something more substantial in mind when we imagine a farm, but when the government says 'farm' it includes the strawberry patch. In fact, if you add up all the farms with annual sales under ten thousand dollars, you will account for more than half of all U.S. farms, but collectively all these still will account for less than 3.0 percent of total U.S. farm output (Table 1). Not surprisingly, these farms don't have much debt; they're not 'in trouble', so to speak. But neither do they contribute much to agricultural output or, for that matter, even to the families that live on them who, understandably, have nonfarm income from nonfarm jobs to support the household (Table 2).

At the other extreme are the big farms, and these are often even bigger than the one our imaginations serve up when our minds think 'farm'. The biggest census sales category is operations annually selling over \$500,000 in farm products. At 1987 harvest prices it would take about 3000 Ohio acres to grow that much corn, and that's the bottom end of this size

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\* Ohio Farm Household Longitudinal Study is supported by the Ohio Agricultural Research and Development Center and U.S. Department of Agriculture (Economic Research Service). Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

category which also includes U.S. giants with annual sales of \$20 million or more. The average sales per farm in this category are over \$1.8 million. Such giants are rare, of course; they account for only about 1.5 percent of all farms. But these few farms account for nearly a third of total U.S. agricultural output (Table 1).

So if we summarize to this point, we get a picture that looks like this: When you combine the smallest farms and the biggest farms you have accounted for 53.6 percent of all the farms and 35.0 percent of all the output. However, few of these farms fit the picture of "family farms", which are the focus of so much of the national attention.

What we can discern from all this is that financial stress among farm households could be severe indeed yet difficult to identify when it is camouflaged in national averages. What makes it severe is that it is so widely spread among commercial family farm households which comprise most farms operations with \$20,000 - \$500,000 in annual sales. These account for nearly half of all farm operators and two-thirds of total output. About one-third of these households are in financial difficulty. Many of these farms do not own enough resources to make them financially secure and are driven by competitive necessity to take calculated financial risks in attempts to make these operations viable enterprises for the long pull. What goes on in these households in their efforts to cope provides some of the most interesting aspects of this survey. Later reports will portray these efforts.

Consider Table 2, for example. Nonfarm jobs are an important source of income in farm households; in fact, it is more important than farm income to the average household, both nationally and in Ohio. The reverse is true mostly among farms that sell over \$100,000 in annual output. Typically, nonfarm income is not unimportant, even among the largest farms. But it is critical to small farms; those selling under \$40,000 in annual output. Among Ohio households that were interviewed, nonfarm incomes subsidized the 1986 losses from farm operations in these size categories (Table 2).

Finally, debt-to-asset ratios tend to rise as farm operations get larger, both in Ohio and nationally (Figure 1). Among the smallest farms debts are modest, only about 10 percent of assets. But in the struggle to modernize and to consolidate small farms into larger, more viable units, debt loads rise and get most severe. And among these farms, a part of the debt crunch comes from the fact that they are too big to treat as part-time responsibilities; the operator is too committed to farming to have time for a non-farm job in town. Nonfarm income on these farms typically comes from other family members who may teach school or drive school buses or otherwise work in the community.

An article will follow shortly which will focus more sharply on the debt burden of Ohio farm operator households.

FIGURE 1

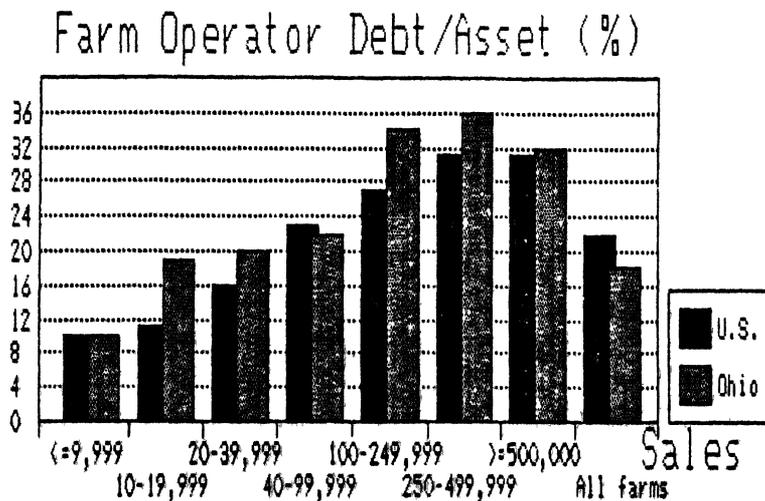


Table 1: Percentage Distribution of Farms, Farm Sales, and Farm Operators by Sales Class, January 1, 1987

Sales Class	U.S. Farms	U.S. Farm Sales <sup>1</sup>	U.S. Farm Operators <sup>2</sup>	Ohio Farm Operators <sup>2</sup>
Under \$10,000	52.1	2.9	39.8	31.9
10,000 - 19,999	10.7	2.6	12.3	15.0
20,000 - 39,999	10.1	4.9	12.3	16.0
40,000 - 99,999	13.3	15.7	16.9	20.2
100,000 - 249,999	9.5	25.2	14.1	13.6
250,000 - 499,999	2.8	16.6	3.5	2.9
500,000 and up	1.5	32.1	1.9	0.5
Total	100.0	100.0	100.0	100.0

<sup>1</sup> 1985

<sup>2</sup> The difference between farms and farm operators is the difference between land ownership which includes inactive owners who rent, and the actual management and risk acceptance of a farm operation. The Ohio study was confined to farm operators. Landlords who merely rented land were not interviewed.

Source: Census, USDA, and Ohio Survey.

Table 2: Average Farm Operator Income per Household  
U.S. and Ohio Estimates  
January 1, 1987

Sales Class	U.S. Farm Operators			Ohio Farm Operators		
	Non-farm	Net Farm	Total	Non-farm	Net Farm	Total
	-----\$1,000-----					
\$9,999 or less	30.7	1.3	32.0	24.0	-2.1	21.9
\$10,000 to 19,999	31.4	2.6	34.0	23.5	-2.6	20.9
\$20,000 to 39,999	19.9	7.2	27.1	23.4	-1.2	22.2
\$40,000 to 99,999	14.8	10.8	25.6	18.7	8.5	27.2
\$100,000 to 249,999	14.4	24.4	38.8	18.0	26.0	44.0
\$250,000 to 499,999	21.0	70.3	91.3	18.1	43.7	61.8
\$500,000 or more	34.1	141.8	175.9	19.1	140.7	159.8
All farms	24.3	11.9	36.2	21.8	5.9	27.7

Source: USDA and Ohio Survey

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OHIO FARM HOUSEHOLD BALANCE SHEETS  
January 1, 1987

This is the second in a series of brief reports summarizing results of a telephone survey of Ohio farm operator households conducted by Ohio State University during 1987. A principal object of the survey was to identify a broad profile of household characteristics and to observe changes in them over time.\* Financial characteristics were particularly important. This article reports some of the relationships between debts and assets that existed January 1, 1987, among these representative households. Balance sheets are summarized in Table 1.

This report emphasizes commercial family farm households: those with gross annual sales between 20,000 and 500,000 and who represent nearly one half of all farm operators and two-thirds of all farm output in the United States. As of January 1, 1987, about one-third of these farms were experiencing financial difficulty.

Debt-to-asset ratios can provide an idea of the 'leverage' that a typical farm is under. Generally as the ratio (leverage) rises, so does risk and the threat to an operation's survival. Farms with leverage (debt) exceeding 40 percent (of assets) are regarded as higher risk by lenders. But the vulnerability of an enterprise varies, by type of farm and other factors. A dairy operation can carry a higher debt load because of the steady cash-flow that comes from a monthly milk check, whereas cash grain operators usually receive income payment for their crops only during the few months when they are

harvested and sold. Also, government program payments soften the effect of leveraging. Leveraged farms that participate in available government programs have an improved capacity for weathering economic hardships than can those where no programs are available, e.g., cow-calf operations. January 1, 1987, debt/asset ratios for these households are summarized in Figure 1. Notice that about one-third of the larger farms (> \$100,000 annual sales) have debt-to-asset ratios of .4 or more .

There are also interesting variations in assets among farm operator households (Figure 2). Notice that non-farm assets are most common (proportionately) among the smallest farms. These farms are least committed to commercial agriculture. But non-farm assets often have the highest liquidity, meaning that they are easier to convert to cash, than are farm machinery or real estate which are difficult to rush onto the market without value sacrifice. Also notice that non-farm assets are least common (proportionately) among commercial farms and that non-real estate farm assets are most common. Machinery, equipment and livestock are the big items here. Livestock has excellent liquidity, but as agriculture specializes fewer farms have livestock. Machinery and equipment tend to be illiquid, and its financing often creates cash flow burdens.

Most commercial-size farms are committed to farming and this contributes to their vulnerability; they have less non-farm

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\*Ohio Farm Household Longitudinal Study is supported by the Ohio Agricultural Research and Development Center and U.S. Department of Agriculture (Economic Research Service). Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

income than smaller farms, they are minimally invested in nonfarm assets (Figure 2), and cash grain operations are more vulnerable than farms with high-liquidity livestock that can be drawn upon when necessity insists.

Not only are commercial cash grain operations less protected from adversity than other farm enterprises, but these are often the ones most driven to risky exposure, motivated far less by greed-without-planning than impelled by a competitive necessity to adapt to technological change or quit. Perhaps nowhere in recent agricultural history has technological change been more swift than in farm machinery. In a decade, post-WWII equipment and capacity were made obsolete by vastly improved horsepower and performance at significantly lower costs per acre. Those who would adopt would gain a significant competitive cost advantage. But the technology was costly; its great promise was accompanied by great price.

Not only must one obtain expensive equipment with terrific capacity for work, but one must also access enough land to keep equipment fully employed. A

frightening dilemma presents itself to families with long traditions on the land - 'get in or get out.' Among the options beyond simply borrowing money that must be considered in order to make this commitment work are to (a) cash in the non-farm assets, (b) cash in the livestock enterprise (and tear out fences) (c) be a custom operator with a narrow line of equipment, (d) be fully employed by accessing additional land, most often by renting because capital has been invested in equipment, (e) buy land (an appreciating asset) if possible, and (f) find non-farm employment for family labor.

These options are considered in an uncertain environment created by changing world trade patterns, interest rates, and technology. But farm operators do not create these changing conditions; they merely respond to them. Usually, these responses involve more than just adjustments in the farm business. For example, farm operators, their spouses, and other family members look to off-farm sources of income. The next article will examine off-farm income and its sources among Ohio farm operator households.

Table 1: Farm Operator Household Balance Sheet  
U.S. and Ohio Estimates  
January 1, 1987

Sales Class	U.S. Farm Operators			Ohio Farm Operators		
	Assets	Liabilities	Equity	Assets	Liabilities	Equity
-----\$1,000-----						
Under \$10,000	144	15	129	207	14	193
\$10,000 to 19,999	192	21	171	237	33	204
\$20,000 to 39,999	228	36	192	265	40	225
\$40,000 to 99,999	327	76	252	356	58	298
\$100,000 to 249,999	508	140	368	549	147	402
\$250,000 to 499,999	838	261	577	976	321	655
\$500,000 or more	2,019	617	1,402	1,380	407	973
All farms	300	65	235	326	59	267

FIGURE 1

## Debt/Asset Ratio by Sales

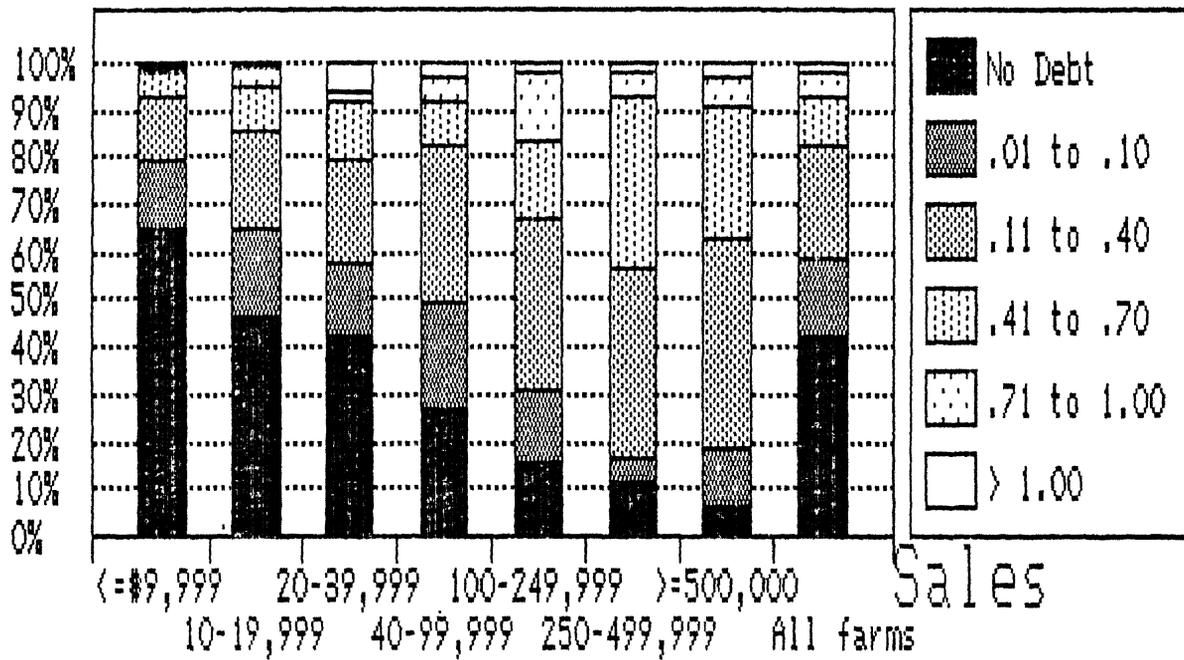
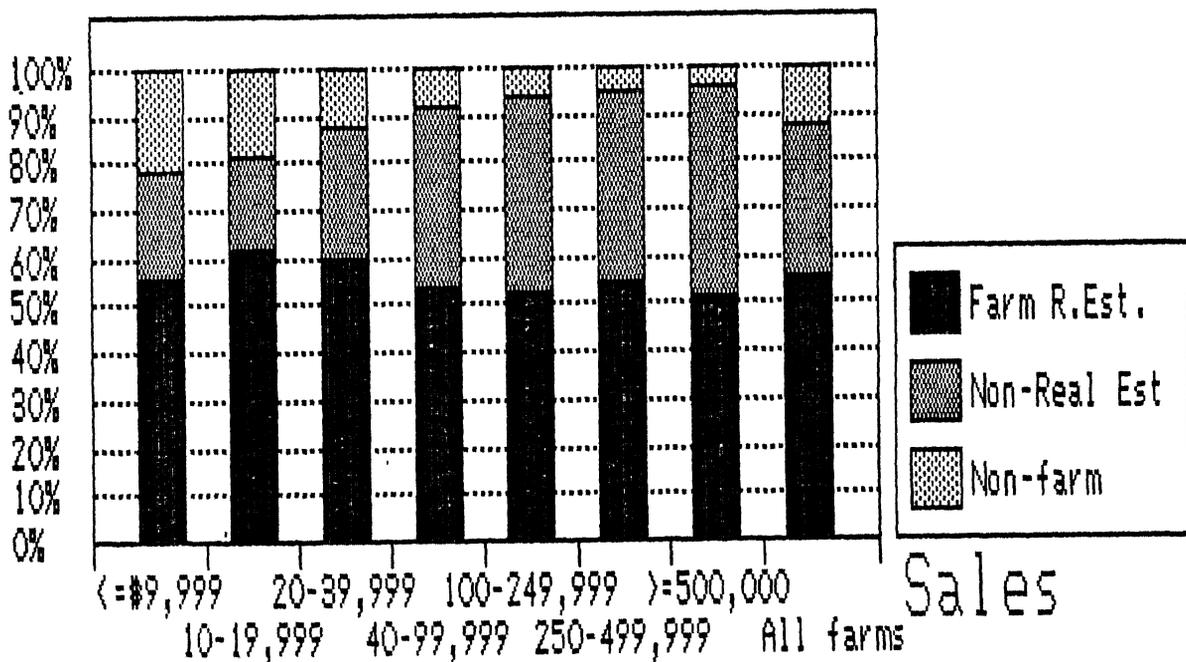


FIGURE 2

## Farm Household Assets (%)



Farm Real Estate includes land and buildings.

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OHIO FARM HOUSEHOLD NON-FARM INCOME  
1986

This is the third in a series of reports portraying conditions in Ohio farm operator households, and the focus of this report is on the importance of non-farm income to these households. Nearly 1,000 Ohio farm families contributed information for this study, providing information about conditions on January 1, 1987 and sources of income for 1986.

Non-farm income is extremely important to Ohio farm households (Table 1). On the average, it comprises over three-fourths of their income. Since farm income fluctuates from year to year, non-farm income has a stabilizing effect on the farm family's income. In addition, those working in off-farm jobs typically receive benefits such as health and disability insurance, workers compensation, life insurance, unemployment insurance, and retirement plans.

The importance of off-farm income is evident for the smaller sales classes (less than \$40,000 in annual sales). In fact, one could argue that the farm serves primarily as a residence for these families with farming furnishing, at most, a small proportion of their income. Even moderate size farms (annual sales totaling \$40,000 to \$100,000) show similar characteristics; non-farm income is crucial in meeting family living expenses and often allows the family to remain in farming.

On larger commercial farms (more than \$100,000 annual sales), the farm business generates most of the household income. In previous reports in this series, we have pointed out some distinctive features of these larger commercial farms. They have a relatively large asset base, but

Table 1: Farm Operator Income per Household  
U.S. and Ohio Estimates  
January 1, 1987

Sales Class	U.S. Farm Operators			Ohio Farm Operators		
	Net			Net		
	Non-farm	Farm	Total	Non-farm	Farm	Total
	-----\$1,000-----					
\$9,999 or less	30.7	1.3	32.0	24.0	-2.1	21.9
\$10,000 to 19,999	31.4	2.6	34.0	23.5	-2.6	20.9
\$20,000 to 39,999	19.9	7.2	27.1	23.4	-1.2	22.2
\$40,000 to 99,999	14.8	10.8	25.6	18.7	8.5	27.2
\$100,000 to 249,999	14.4	24.4	38.8	18.0	26.0	44.0
\$250,000 to 499,999	21.0	70.3	91.3	18.1	43.7	61.8
\$500,000 or more	34.1	141.8	175.9	19.1	140.7	159.8
All farms	24.3	11.9	36.2	21.8	5.9	27.7

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also they have relatively high leverage (debt-to-asset) ratios. They have placed large amounts of their capital in farm real estate and especially in livestock and farm machinery. They have relatively few off-farm investments. In short, they have committed nearly all their financial assets to agriculture and have assumed financial risk by borrowing capital.

These larger farm operators also have committed their own labor and managerial resources to their farms (Figure 1). A low proportion of larger operators are employed in off-farm jobs. In contrast, most of the farm operators in the smaller sales classes are employed off the farm. On farms in the smallest sales class, more than 88 percent of the operators worked off the farm. Conversely, on farms with sales more than \$100,000, very few operators work in off-farm jobs.

On the average, slightly over half the farm operators work off the farm; but obviously averages are misleading in this case. Operators of small farms tend to view off-farm jobs as their primary source of income; larger operators commit nearly all their time to the farm.

On the average, slightly more than half of the spouses of farm operators are employed in off-farm jobs, but here averages are not so misleading; about the same proportion of spouses in all farm sales classes work off the farm. Spouses and other family members contribute significantly to household income, regardless of farm size (Figure 2).

Spouses and other family members earnings are important on larger farm operations especially those with \$100,000 to \$500,000 annual sales. One could speculate that spouses earnings have become more important to larger commercial farm households during the 1980's when agriculture faced trying economic conditions.

Where do farm operators and spouses work in their off-farm jobs? Employment by industry is depicted in Figure 3 for farm operators, their spouses, and all Ohio workers. Farm operators tend to work in manufacturing (38 percent), services (20

percent) and transportation (11 percent). Spouses tend to work in services (55 percent), manufacturing (12 percent) and retailing (11 percent). Income from the service sector frequently comes from teaching and nursing.

Annual off-farm wages and salaries in 1986 averaged \$20,000 for farm operators, which compares favorably with the average of \$19,800 received by all Ohio wage earners. Farm spouses fare less well in their off-farm jobs receiving about \$11,400 per year. The part-time and seasonal nature of many of their jobs may be a partial explanation for the lower earnings of spouses.

Besides off-farm jobs, farm families receive income from numerous non-farm sources, such as interest, dividends, rent, social security payments, and retirement accounts. These other sources are especially prevalent among the largest farm operator households (annual sales greater than \$500,000).

Non-farm income is likely to remain crucial for all Ohio farm operator households. In the case of small farm operations, families depend on off-farm wages of both the farm operator and the spouse. On larger farms, the spouses' off-farm wages and other non-farm income become important. Not only does this income help pay for family essentials, but also it helps buffer year-to-year swings in farm income.

A stable or growing non-farm economy is critical to the financial well being of Ohio farm families. Manufacturing, service, and transportation sectors furnish the majority of off-farm jobs to farm families. In fact, for most Ohio farm families, off-farm jobs have enabled them to weather the disastrous economic climate in the farm economy during the 1980's. These opportunities are not as readily available in the western corn belt.

The next report in this series will take a closer look at farm operations. Issues such as sources of farm income, land tenure, crop yield, and costs will be discussed.

FIGURE 1 Operators: % With Off-farm Jobs

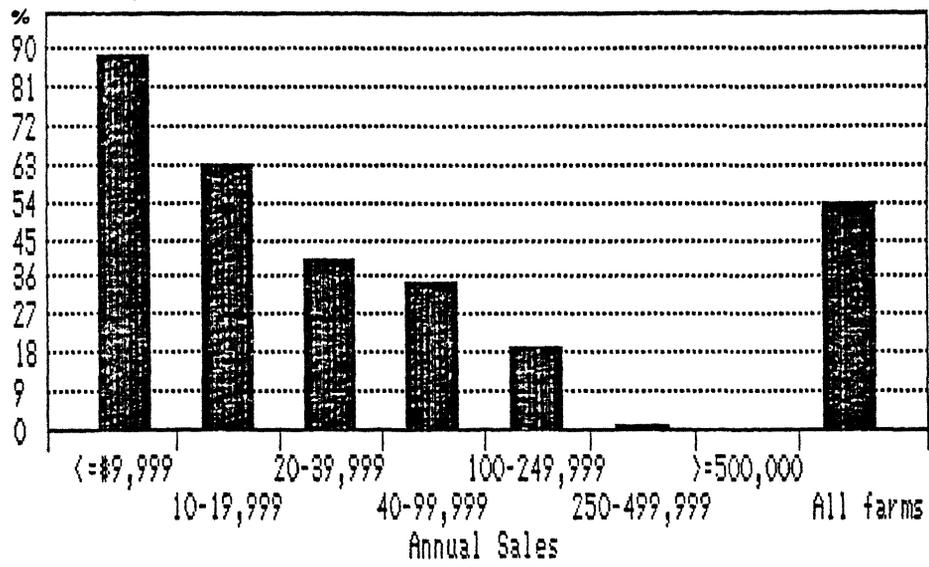


FIGURE 2 Sources of Non-farm Income

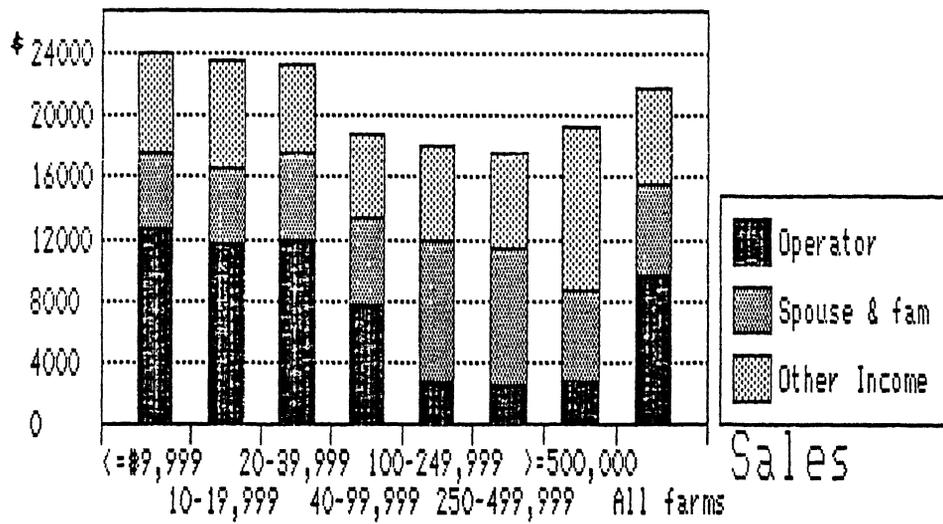
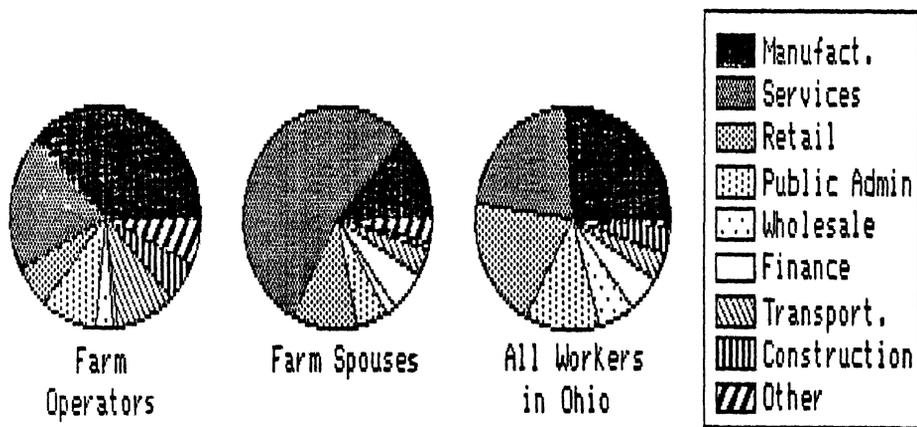


FIGURE 3 Employment by Industry in Ohio



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OHIO FARM HOUSEHOLDS' FARM OPERATIONS  
January 1, 1987

This is the fourth in a series of articles reporting conditions of Ohio farm households. The focus of this report is on production costs, yields, acres operated, and sources of farm receipts for the nearly 1000 farm households that provided information for this study.

Some noticeable differences between farm households have been pointed out in previous reports. Farms with annual sales totaling less than \$100,000 per year comprise over 80 percent of the farms but are responsible for only one-fourth of the farm production. Larger farm operations receive

only a modest return from farming; they have a relatively large asset base, but also are relatively highly leveraged; they have committed their capital to agriculture and hold few off-farm assets; operators of these larger units tend to work only on the farm, but off-farm employment by their spouses is an important source of non-farm income for these households. Differences in production costs between larger and smaller farms also are noticeable.

Cash costs are a major share of total costs. Costs other than cash costs

Table 1. Crop and Livestock Productivity Measures, 1986.

Sales Sales	Crop Yields			Livestock		Productivity Index <sup>a</sup>
	Corn	Soybeans	Wheat	Dairy	Hogs	
	-----bushels per acre-----			Milk (lbs.) per cow	- Pigs per litter	
< \$10,000	107	38.5	43.7	13,275	8.5	97
10 - 19,999	116	38.4	44.1	11,833	7.3	94
20 - 39,999	120	39.4	46.3	13,533	7.9	100
40 - 99,999	132	41.1	49.4	14,785	8.3	107
100 - 249,999	135	43.0	48.8	16,100	8.2	110
250 - 499,999	128	42.4	46.0	16,478	8.2	108
≥ \$500,000	136	42.7	49.5	17,239	8.1	112
State Average <sup>b</sup>	122	41.0	46.0	12,888	7.9	100

<sup>a</sup> For each sales class the productivity index is computed by the following: First, the index for each crop or livestock enterprise is computed by dividing yields by the state average. Then, the indexes for corn, soybeans, wheat, dairy, and hogs are averaged.

<sup>b</sup> Ohio Agricultural Statistics Service.

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include depreciation, value of unpaid operator and family labor, the implicit cost of operator and family capital, and changes in values of owned assets. Figure 1 helps visualize the effect of farm size on costs. For small farm operations (less than \$40,000 annual sales), cash costs exceed sales, and the cash cost per dollar sales exceeds 1.0. Farms with annual sales of \$40,000 or more have sales exceeding cash costs, and for these larger farms, the ratio is relatively constant, between 0.70 and 0.80.

These costs are averages for all types of farm operations. Obviously, they differ between one type of farm (e.g. dairy) and another (e.g. cash grain). But as we proceed into more detail in later articles and examine enterprises separately, this generalization remains true: cash costs per dollar sales decrease as farm size increases. Several explanations are possible: larger farms are more efficient, larger farms are able to obtain volume discounts in purchasing inputs, and larger farms are able to realize higher prices for products.

Other costs per unit of sales, such as depreciation, are affected by farm size in much the same way. As farm size increases, average costs per unit of farm product decline. This is not to say that all farms must be large to be profitable. There are variations around these averages, and some operators of small farms are able to realize a profit. But often operators of small farms may lack the capital or managerial resources to expand. It is generally true that cost advantages realized by larger farms do put them at a competitive advantage in the market place.

Another conclusion that can be drawn from Figure 1 is that smaller farms with high per unit costs quickly feel the squeeze of lower commodity prices. The farms that can endure these falling commodity prices tend to be the larger commercial farms. But this is moderated by two important facts that have been reported previously: (1) smaller farms have a larger share of their household income from off-farm sources and (2) larger farms are more leveraged (higher debt-to-asset ratios) and

have heavier cash commitments such as interest and rent.

The productivity measures, shown in Table 1, indicate that crop yields and livestock productivity tend to increase as farm size increases. The "productivity index" in Table 1 is an indication of crop yields and livestock productivity for farms in this sample compared to state averages. An index of 100 means that the farms in that sales class have average crop yields and livestock productivity. Productivity indexes of 107 to 112 achieved by larger farms in the sample indicate that their production per acre or per head was about 7 to 12 percent higher than state averages.

As farm size increases the proportion of owned land decreases and the proportion of rented land increases (Figure 2). The average acres operated by farm households in the sample is 336 acres, of which half is rented. Larger commercial farms (those with annual sales of more than \$100,000) operate much larger acreages and rent about 60 percent of their total acres.

Sources of farm receipts vary by farm size (Figure 3). Crop receipts include sales from corn, soybeans, and wheat, significant sources of income for farms, but especially so for farms with \$10,000 to \$100,000 annual sales. Livestock receipts include milk, cattle, hogs, poultry, sheep, and miscellaneous livestock sales. Larger commercial farms (more than \$100,000 annual sales) account for relatively more livestock sales, especially milk. Government payments make up a fairly constant share (6 to 9 percent) of farm receipts. Other sources of income include hay, oats, barley, other field crops, orchards, vegetables, and custom work on other farms. Hay is particularly important to the smallest farms and some orchards and vegetable operations are represented in the largest farm sales category.

Succeeding reports will investigate marketing issues on Ohio farms: with whom do farmers sell and buy, and what marketing practices do they use.

FIGURE 1

## Cash Expenses per Dollar Sales

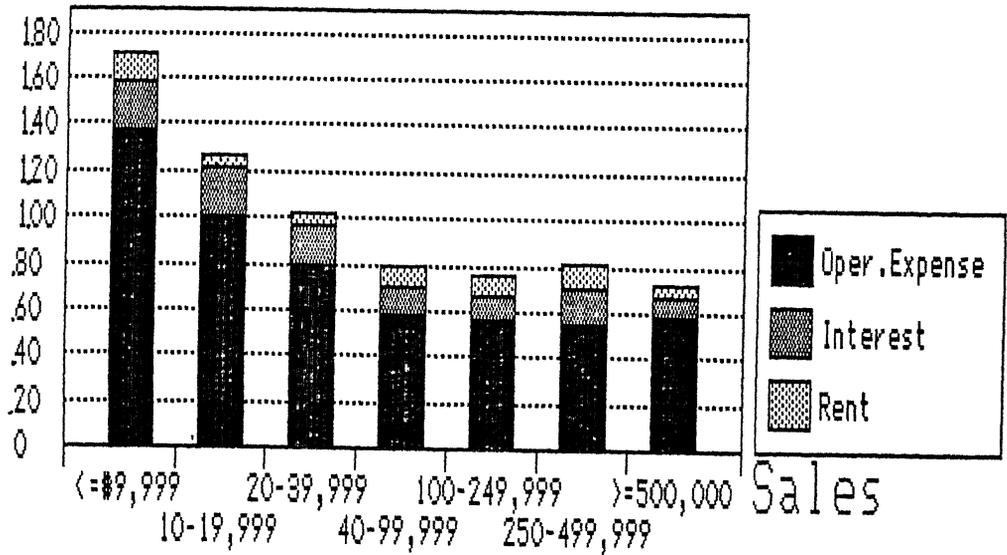


FIGURE 2

## Acres Operated

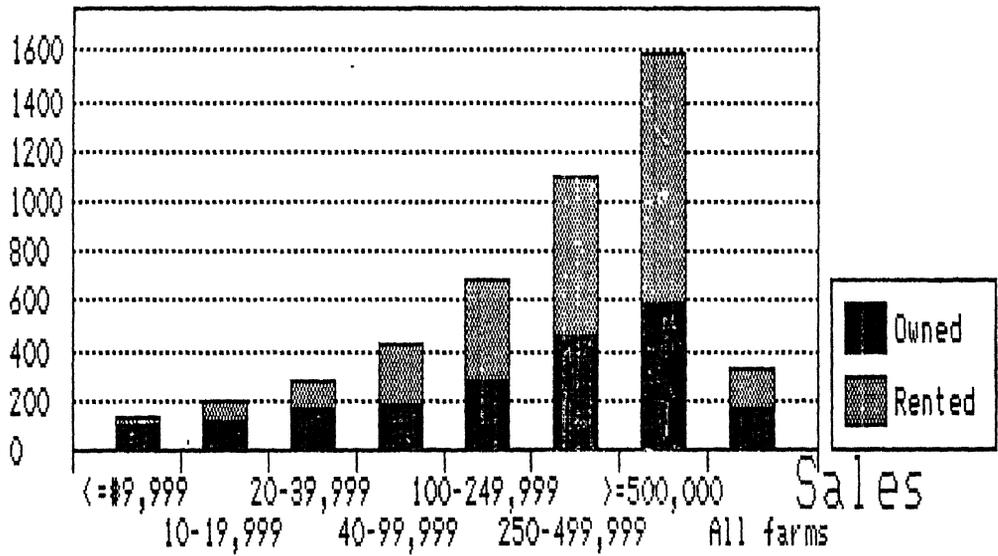
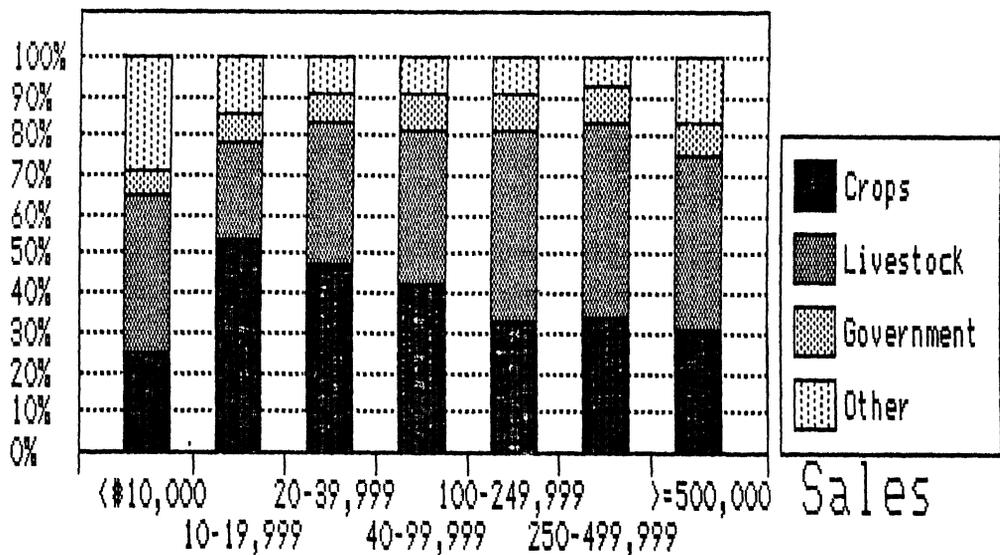


FIGURE 3

## Sources of Farm Receipts



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**FARM EXPENSES INCURRED BY OHIO FARM HOUSEHOLDS**  
January 1, 1987

This is the fifth in a series of articles exploring the condition of Ohio farm operator households. Nearly 1000 households, representative of all operating farms in Ohio, provided information for this series. This particular report concentrates on farm expenses: their type, amounts incurred, and the market area in which farmers acquire inputs.

Earlier reports in this series discussed the low net farm income experienced by farm households with small farm operations. Smaller farm operations, or those with annual sales of less than \$40,000, actually received negative net farm income during 1986 (Figure 1). Larger farms, or those with more than \$40,000 annual sales, had positive net farm income; however, most incomes were rather modest considering the amount of unpaid family and operator labor and capital that was devoted to the farm operation.

Economies of size is a phenomenon experienced in many industries, including farming. Average cost per unit of production decreases as more units are produced. For a multi-product industry like Ohio agriculture, average cost per dollar of sales is used to represent the economies of size concept. As farm size increases, average cost per dollar sales tends to decrease and then becomes nearly constant (Figure 2).

In general, small farm operations are at a disadvantage due to high costs for inputs such as fertilizer, chemicals, seed, feed, and other cash expenses. A number of factors may be responsible: high prices paid for farm supplies, relatively low prices for products, low yields, or inefficient use of inputs. The last report examined crop yields and livestock productivity and estimated that these were slightly less on smaller farms than on

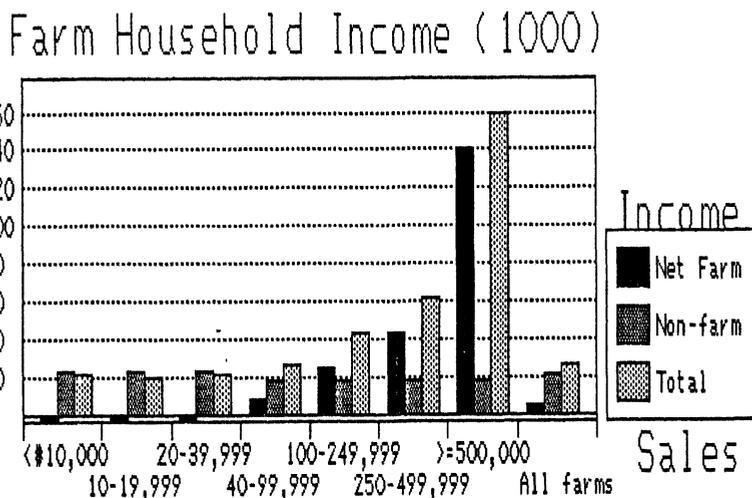


Figure 1.

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larger, more profitable ones. Most likely, the unfavorable prices paid and received are responsible for much of the negative net farm income from smaller farms.

In addition, depreciation expenses associated with farm equipment, machinery, and buildings are relatively high for these small operations. It is difficult to equip a small farm economically as shown by their large depreciation per dollar sales (Figure 2). Many operators of smaller farms overcome this problem by custom hiring or leasing some operations rather than purchasing the necessary machinery.

Farm operators' allocation of expenses between various inputs is surprisingly consistent across farm size (Figure 3). Interest, cash rent, and depreciation account for about one-third of all expenses regardless of size. Fertilizer, chemicals, and seed comprise another 20 percent of expenses, as do miscellaneous expenses. Those components affected the most by farm size are feed, hired labor, fuel and repairs. Larger farms have a larger share of their expenses in purchased feed for two reasons: first, they tend to purchase more and raise less, and second, farms producing livestock tend to fall in the larger sales classes. Larger farms tend to rely more on a paid labor force rather than unpaid family labor, which accounts for the larger labor expenses on these farms. The use of larger, more fuel efficient equipment may explain the relatively low fuel and repair expenses incurred by larger farms.

Operators of larger farms buy their inputs from more distant sources. Figure 4 illustrates the average distant from the farm to fertilizer, chemicals, seed, and

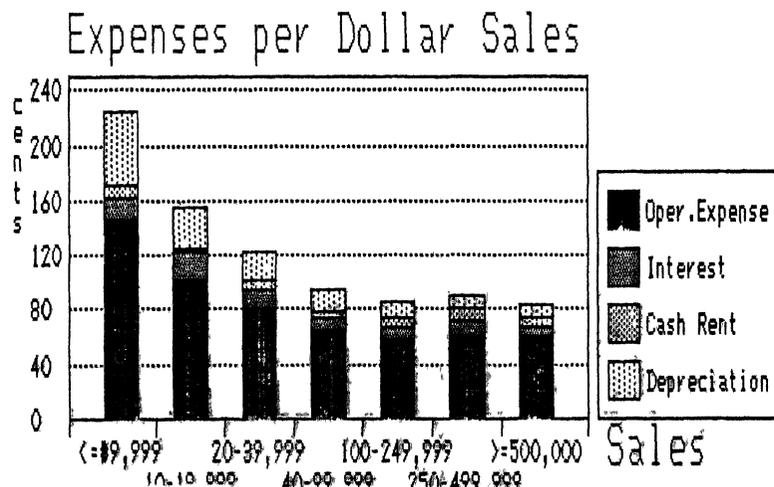
feed dealers. This distance is over twice as far for the largest farms (over \$250,000 in annual sales) as it is for the smallest ones (less than \$40,000 annual sales). Operators of larger farms appear to shop over a much wider market area and probably are paying lower per unit prices as a result.

Of course, the propensity of larger farmers to purchase from more distant sources has important impacts for local communities. As farm size increases, local dealers face increased competition from dealers in neighboring counties. Operators of larger farms may purchase seed, fertilizer, parts, and fuel over a 3 or 5 county area and look for bargains from even more distant sources. On the other hand, the operator of the smaller farm may do little searching outside the closest farm supply center.

Another interesting difference between operators is their purchase of management services from off the farm (Figure 4). Accountants, lawyers, consultants, and computer services are purchased regularly by the largest farms and infrequently by the smallest. The most striking difference is in the use on computer services, where practically none of the operators of smallest farms claim to use computers compared to over one-third of the operators of the largest farms using them in their business.

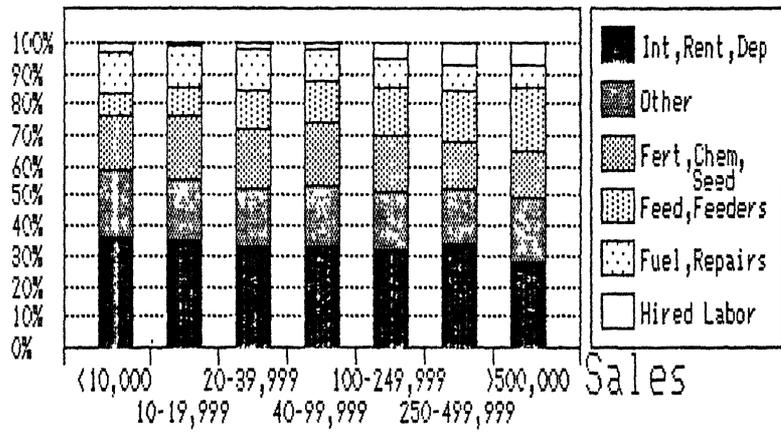
The next report will survey marketing farm products on the representative farms: where products are marketed, what marketing tools are used, and distances between farmers and buyers.

Figure 2.



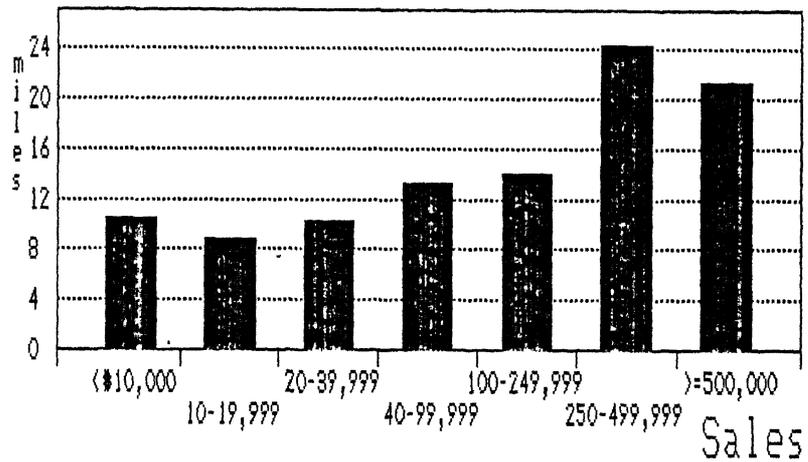
### Allocation of Expenses

Figure 3.



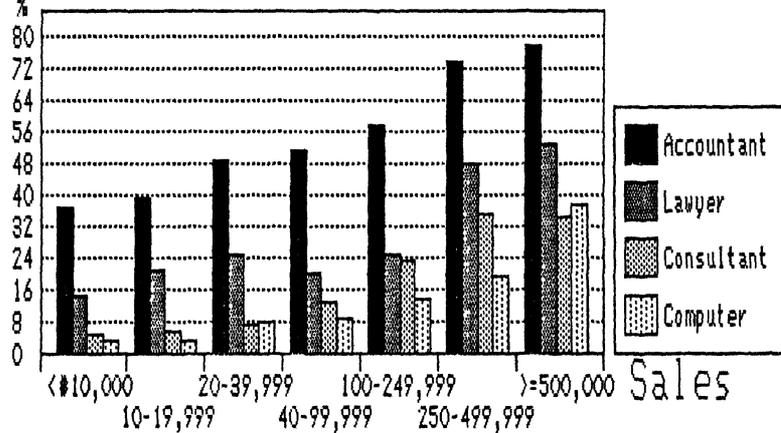
### Inputs: Distance to Source

Figure 4.



### Farms Using Management Service

Figure 5.



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**SALES OF FARM PRODUCTS FROM OHIO FARM OPERATIONS**  
**January 1, 1987**

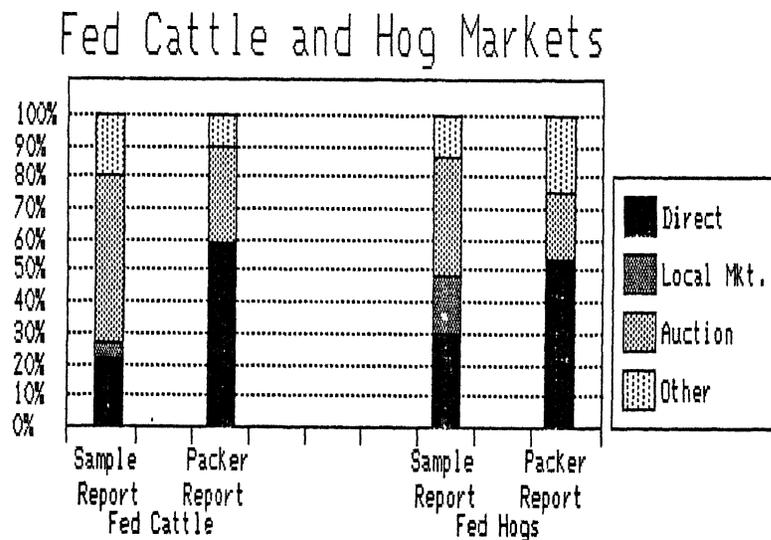
This is the sixth in a series of articles describing characteristics of nearly 1000 farm operator households surveyed by The Ohio State University in 1987. The last article summarized farm operating expenses. This article summarizes some aspects of product sales from these farms.

Marketings of fed cattle and hogs are sales for slaughter, most of which will occur within a day and within Ohio. But slaughter livestock may be shipped to packers in other states. The prevailing flow of farm product shipments in this part of the country is from west to east. Similarly, Ohio packers will buy slaughter livestock anywhere they find prices affordable, not just from Ohio. Farms and markets in Indiana or farther west may be regular suppliers.

The bars in Figure 1 summarize the Ohio response to questions about sales for slaughter. Respondents reported that about 27 percent of cattle and 48 percent of hogs were sold direct-to-packers or through local daily markets. Notice that local markets tend to be more important for hogs than for cattle. This is typical of the Cornbelt. Farther west, local markets are almost exclusively hog markets. Auctions are popular in Ohio, accounting in this survey for 53 percent of cattle sales and 38 percent of hog sales. Auctions are less important for hogs farther west. These differences appear in contrasting reports packers provide to the USDA about their sources when they buy slaughter animals.

In 1987, Ohio packers reported to the USDA that they bought nearly 60 percent of

Figure 1.



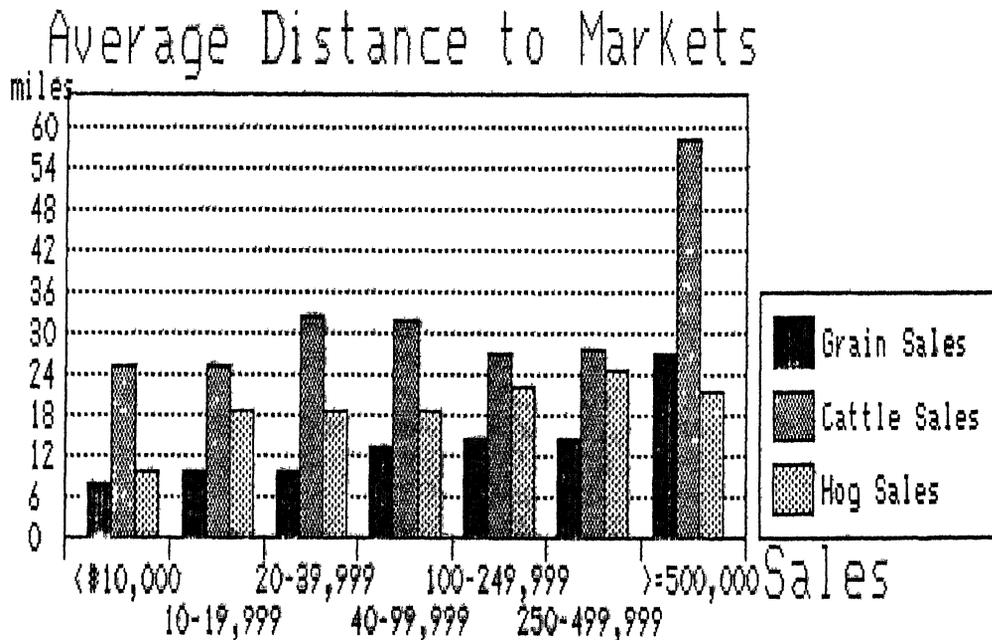
\*Ohio Farm Household Longitudinal Study is supported by the Ohio Agricultural Research and Development Center and U.S. Department of Agriculture (Economic Research Service). Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

farms or local markets, and they bought only 30 percent of their steers and heifers and 21 percent of their hogs from auctions. Contrasts of this kind between our household reports and the packer reports appear to confirm packer purchases from western locations where marketing patterns are different. Responses to the "other" category are not directly comparable. By "other," the packers meant large central markets at Cincinnati, Indianapolis, St. Louis and several other locations. These are not available markets for most Ohio farms. So Ohio respondents appeared to have used "other" to refer to concentration yards, dealer markets, collection points (all of which are other names for local markets), or to order buyers, truckers, or traders, all of which would have been regarded by the USDA packer reports as direct sales.

Typically, hogs moved 25 miles or less to market, and cattle less than 35 miles (Figure 2). This is not surprising, considering the large number of available markets. In 1986 there were 90 local markets, 41 auctions and over 100 packers in Ohio.

1986 crops harvested on Ohio farms had a variety of destinations. Corn is a feed grain intended for livestock consumption. Wheat is a food grain headed for world markets. Beans are oilseeds headed for processing. Hence almost all the beans and wheat were sold at harvest and headed for off-farm destinations. Almost all the hay was kept at home for feed, and more than half the corn was also fed or stored on the farm (Figure 3). CCC means stored in government-approved storage and used as collateral for loans in government price support programs. Harvest sales of grains and oilseeds are usually to local grain elevators close to the farm (Figure 2). Respondents reported that the average distance hauled was less than 15 miles, although the largest operations often traveled to larger elevators farther away. In 1986 there were over 600 locations in Ohio where farmers could deliver harvest-sale grains. Most sales of hay occur between farms and do not go through organized markets, of which there are few in Ohio, and these mostly in the Northeast. Some of the 'other storage' referred to 1986 year-end inventories mentioned by respondents in these early-1987 interviews.

Figure 2.



Prices of farm products are notably unstable, fluctuating seasonally, weekly or even daily by amounts large enough to keep farmers uncertain about income or profit prospects when products are ready for market. Various contractual arrangements about future price and delivery are available and are used by some farmers to reduce this uncertainty (Figure 4).

Forward price or delayed price are contracts with local elevator operators. Futures or options involve organized commodity markets in cities like Chicago through which local brokers can arrange contracts for farmers. As farms get larger and the amount of money involved gets more substantial, farmers are more likely to

enter into contracts for some share (but seldom all) of a crop. Also farmers are more likely to make local agreements with markets where they are known than with brokers and commodity exchanges which seem more remote and mysterious. Contracts on crops are much more common than on livestock, although only a minority of farm operations (excepting the largest) enter into contracts of any kind for any product. Traditionally, most farmers have long held prices in the same regard as weather: something they cannot affect and which they must take as it comes.

The next article will focus on the amount of business and household debt and sources of credit.

Figure 3.

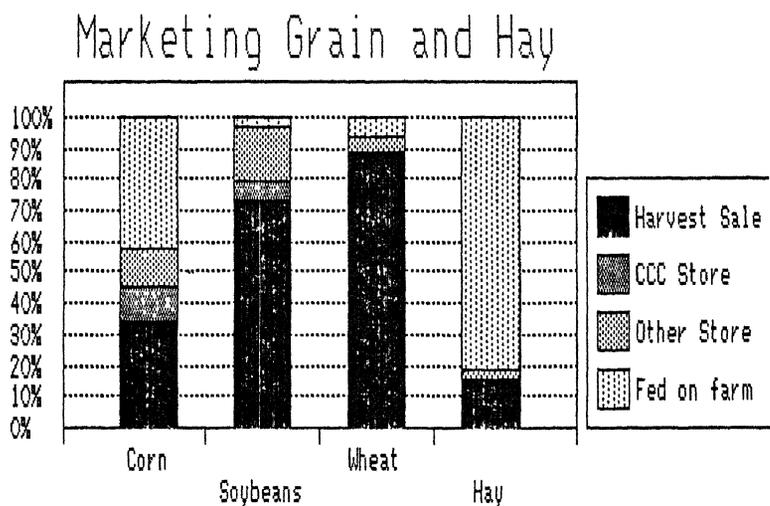
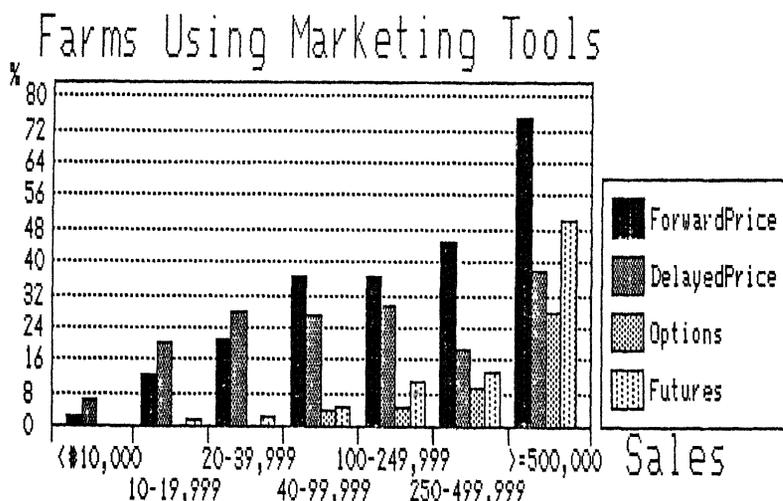


Figure 4.



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**DISTRIBUTION OF OHIO FARM HOUSEHOLD DEBT**  
January 1, 1987

This is the seventh in a series of articles describing characteristics of nearly 1000 farm operator households surveyed by The Ohio State University in 1987. The last article summarized farm product sales from Ohio operations. This article will highlight the amount of business and household debt and sources of credit.

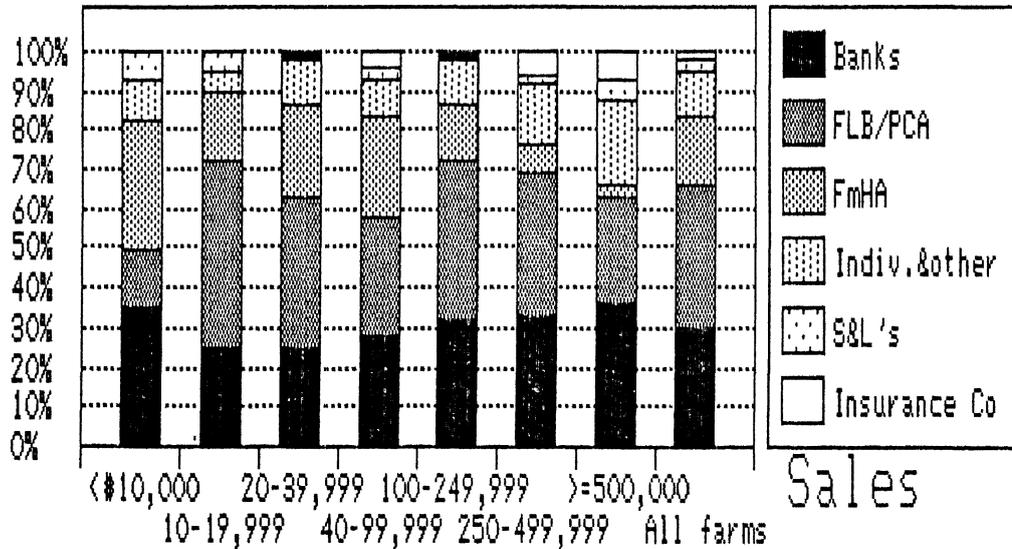
Fifty-eight percent of Ohio farmers use some debt to finance their operations (Figure 1). One of the measures of risk associated with the use of debt is the debt-to-asset ratio. Of course, this measure is not the only measure used in determining the fitness of a borrower. But, a general rule of thumb is that a debt-to-asset ratio of less than 0.40 indicates a well managed and reasonably profitable operation will continue to remain solvent and will at least in the

short run improve its equity position. A debt-to-asset ratio of 0.40 or more indicates that the operation could be vulnerable if not well managed and profitable. Of course, these sweeping generalizations are used with caution when they are applied to any particular farm operation.

Averages could lead one to conclude that Ohio farmers don't have much debt. Less than one-fifth of Ohio farm households have debt-to-asset ratios of greater than 0.40, and the average debt-to-asset ratio is only 0.18, however, this low average debt load hides the fact that a large proportion of Ohio's commercial farms do, in fact, have large amounts of debt. About one-third of the larger farm operations (\$100,000 or more in annual sales) have debt-to-asset ratios of 0.40 or more.

Credit Sources, Excluding CCC

Figure 1.



\*Ohio Farm Household Longitudinal Study is supported, in part, by the Ohio Agricultural Research and Development Center. Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

Ohio farmers identified six major lenders (Figure 2). The four largest lenders - commercial banks, Farm Credit System, Farmers Home Administration, and individuals and businesses - provide about 95 percent of the farm credit.

From a lenders perspective, two issues may be of special interest. First, how does lenders' market share vary by farm sales class? That is, who lends to larger farms and who to smaller ones. Second, how does lenders market share vary by debt-to-asset ratios. That is, who lends to the safest/riskiest farm operations.

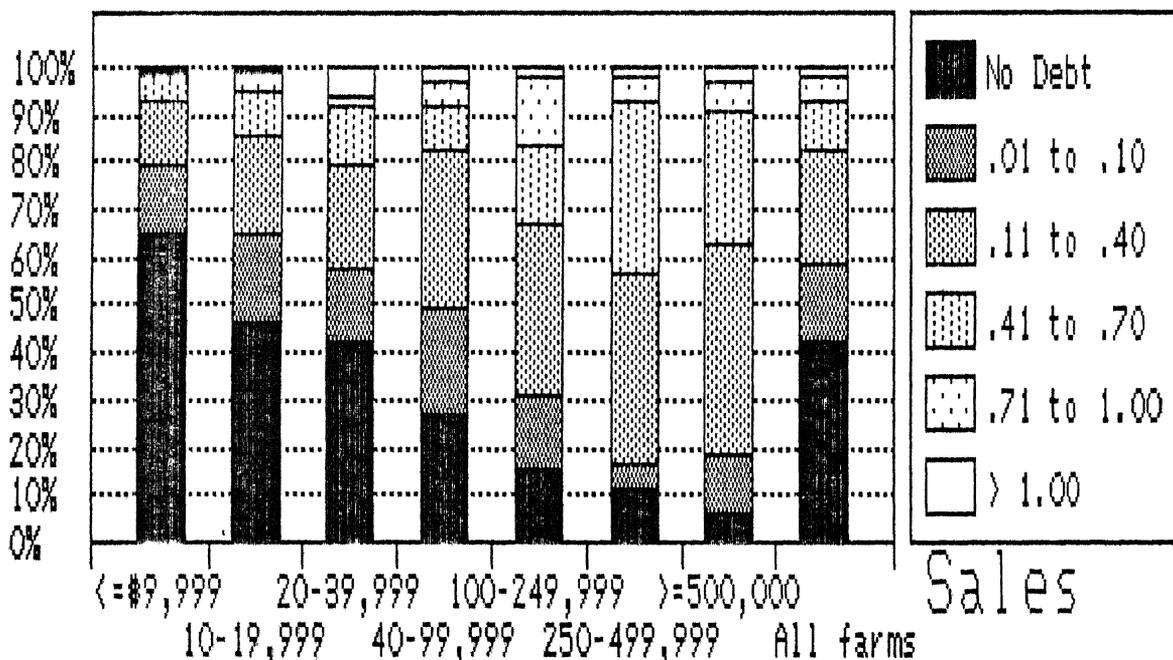
Lenders' market share by sales class uncovers some interesting patterns (Figure 2). On average commercial banks lend about 30 percent of the farm credit, but they play an increasingly important role as farm size increases. The Farm Credit System (Production Credit and Federal Land Bank Associations) has the largest share of farm credit, about 35 percent. The Farm Credit System services a broad range of farm operations; however, their activity seems to be the least among the very smallest (less than \$10,000 annual sales) and the very largest (\$500,000 annual sales or more). Farmers Home Administration lends mostly to small and medium size farms (less

than \$100,000 annual sales), which is consistent with its legal mandate. Individuals and other, which includes farm supply businesses (such as equipment dealers), play an increasing role as farm size increases. On the largest farms (\$500,000 or more in annual sales), over one-fifth of the debt is owed to individuals and others.

Lender market share varies by farmers' leverage as well as by farm size. Figure 3 illustrates that for farms with debt-to-asset ratios of less than 0.40, banks have about 35% of the business; Farm Credit System has about 35%; FmHA has about 8%; individuals have about 15%; and the remainder is distributed between savings and loans and insurance companies. Comparisons to farms with debt-to-asset ratios of 0.40 or more shows some interesting differences. Banks and individuals have much smaller market shares; Farmers Home Administration has a much larger one. Being the "lender of last resort" might also explain this increasing role of assuming the higher risk borrower. Of interest is the fact that Farm Credit System has about the same market share among highly leveraged borrowers as among those with less leverage.

Figure 2.

## Debt/Asset Ratio by Sales



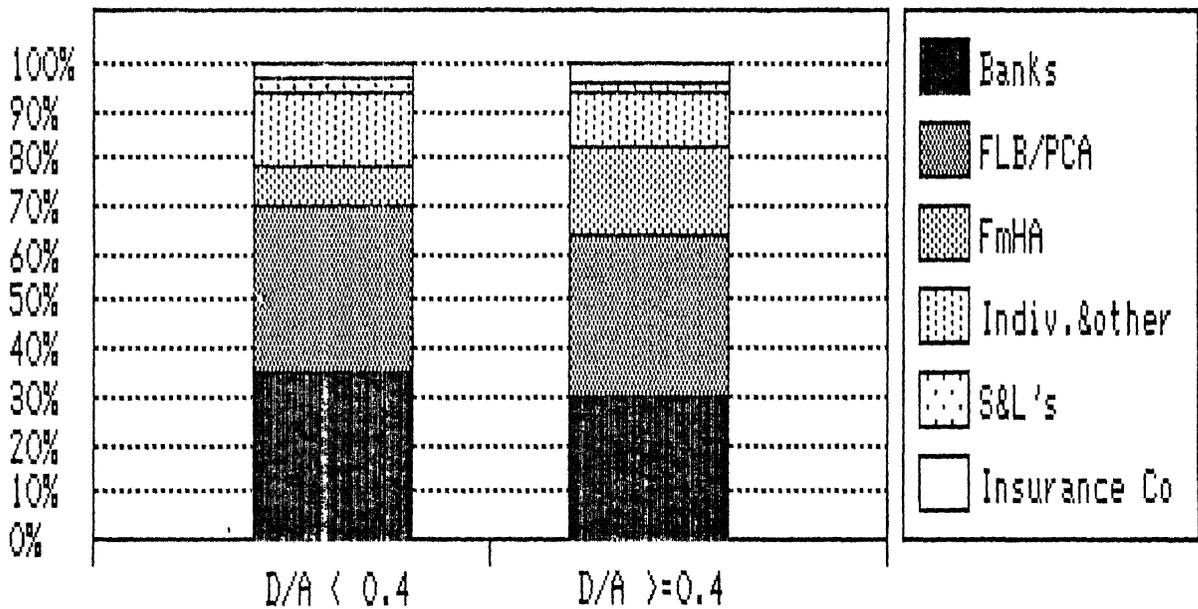
We asked three questions that attempt to give a better picture of the climate between lenders and farmers. The questions asked whether, in 1986, the operator was delinquent on a loan, had a loan restructured, or had a loan principal payment postponed. Of farms with debt-to-asset of 0.40 or less, only 2 percent were delinquent compared with 20 percent of farms with debt-to-asset of 0.40 or more. So, one out of five of the highly leveraged farm households were looking forward to some uncertain times. Being delinquent is not an easy status to overcome. To the restructuring question, nine percent of the farm households with a debt to-asset of 0.40 or less had been restructured. This could mean that the present lender accomplished the restructuring or that the farm household was refinanced elsewhere. Farmers with a debt-to-asset of 0.40 or more restructured at a higher rate; 19 percent in this category sought restructuring. Lastly, to the postponement question, on those farms with a debt-to-asset ratio of 0.40 or less, only two

percent participated; on those farms with a debt to asset of 0.40 or more, only six and a half percent participated. This low postponement in the higher debt-to-asset ratio could be misleading. A respondent would rather admit to restructuring a loan over postponement of payment on principal.

For many Ohio farmers with small operations, there is little worry about debt. But for a significant proportion of larger commercial farms, farm debt is cumbersome. For lenders, being able to manage the loan portfolio so that the corporate or institutional objectives are realized while at the same time being able to service existing customers and attract new customers are primary objectives. Accurate perceptions of "what is" or "what might be" are critical in determining the proper future direction for farm households who are served by lenders.

The next report will describe soil conservation efforts on Ohio farm operations.

Figure 3. Credit Sources, by Debt/Asset



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**SOIL CONSERVATION PRACTICES**  
January 1, 1987

This is the eighth in a series of articles describing characteristics of nearly 1,000 Ohio farm operator households surveyed by The Ohio State University in 1987. This article focuses on the topic of soil conservation, which continues to be a major concern for Ohio farm operators. Soil erosion can be detrimental to future soil productivity, it can increase the amount of fertilizer expenses, and it can impose costs on downstream water users. A more pragmatic reason for concern about soil conservation is the stipulation that a soil conservation plan approved by the Soil Conservation Service may soon be required for participation in some farm programs.

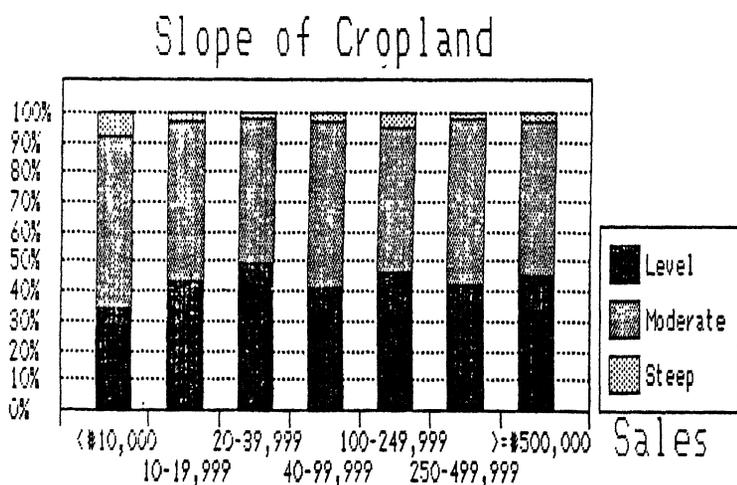
The slope of cropland is a major determinant of the use of soil conservation practices. As shown in Figure 1, over 90 percent of cropland of the surveyed farms is estimated to be nearly level or moderately sloping, regardless of sales class. Approximately 35-50 percent of all cropland is estimated to be level or nearly

level. Another 50-55 percent is moderately sloping land. Less than 5 percent of the cropland was reported to be steep hillside. The smallest farms (less than \$10,000 annual sales) have the most sloping cropland, but yet only 10% of their cropland is on steep slopes.

Tillage practices employed by farm operators are influenced by the slope of the cropland. Figure 2 shows that on level land 64 percent of the operators use a tillage system consisting of a moldboard plow and a disc or other secondary tillage equipment. About 16 percent of the operators use systems consisting of a chisel plow and secondary tillage equipment, and 8 percent use "minimum" tillage which consists mostly of secondary tillage operations. No-till systems are used on level ground by about 10 percent of the operators.

On moderately sloping land, 50 percent of the operators use a moldboard tillage

Figure 1.



\*Ohio Farm Household Longitudinal Study is supported, in part, by the Ohio Agricultural Research and Development Center. Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

system. The use of chisel plow and "minimum" tillage systems remains about the same. However, use of no-till systems on moderately sloping land more than doubles to 25 percent of all operators. These changes from the level land practices reflect the operator's awareness and concern for soil erosion. That is, as cropland becomes more sloping, the operators move to soil conserving tillage practices.

When cropland is situated on predominantly steep hillsides, approximately 58 percent of the operators use the moldboard plow system, 30 percent use a no-till system, and virtually no chisel plow systems are used. Again, the increase in no-till practices reflects the operator's concern over soil erosion. But the high proportion using moldboard systems is not easily explained. But we do know that the smallest farms have the highest share of steep slopes and that the smallest farms have been slowest to change from traditional farming practices, as is illustrated by the figures which follow.

Figure 3 records the tillage practices used by farm operators as farm size (as measured by annual sales) increases. With the exception of the largest sales class, the use of a moldboard tillage system decreases as farm size becomes larger. The use of a chisel plow tillage system increases from 8 percent of the operators in the smallest sales class to 37 percent of the operators in the second largest sales class. The use of no-till practices also increases as farm size increases, from

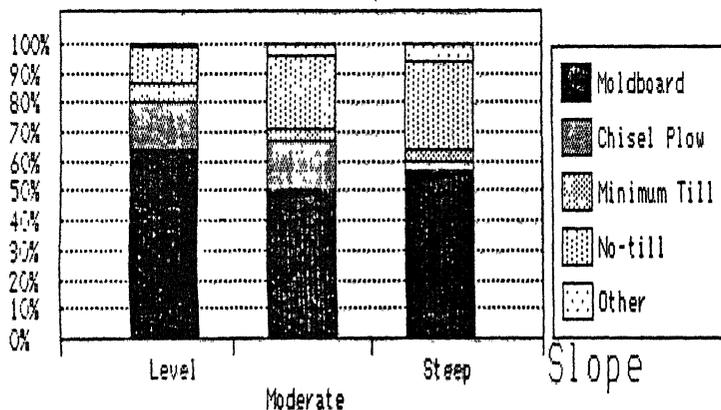
approximately 12 percent of the smaller class to 30 percent of the operators in the largest sales class. Soil conservation may be a concern with these larger farm operators, but the labor and horsepower efficiencies associated with conservation tillage systems are also important considerations.

We asked farm operators about their use of crop rotations. Use of crop rotations is quite common, even though the crops used may be different than those in an earlier era. Today, row crops tend to dominate. Over half of the farm operators identified continuous row crops (e.g., corn-soybeans) or row crops-small grain as their rotation. The use of continuous row crops is especially prevalent as farm size increases. Rotations with pasture or hay are used by about one-fourth of all farm operators, and they tend to be used more on smaller farm operations. (Crop rotations refer to cropland use, and not acres set-aside and diverted for government programs.)

Finally, the number of conservation practices used increases as farm size increases (Figure 5). Forty-three percent of those in the smallest sales class use 2 or more conservation practices, while 72 percent of those in the largest sales class use 2 or more practices. Conversely, 32 percent of the smallest sales classes operators use no conservation practices, while less than 10 percent of the operators in the larger sales class use no conservation practices. Of course, larger farm operations have

Figure 2.

### Conservation Practices Used



larger acreages and more situations where conservation practices are required.

In summary, farm operators' use of conservation tillage and other soil conservation practices shows their concern

with maintaining or enhancing the soil. The larger commercial farm operations have been more prone to adopt conservation practices than have the smaller ones. The next article will address participation in government programs, farm organizations, and community activities.

Figure 3.

### Tillage Practices by Sales

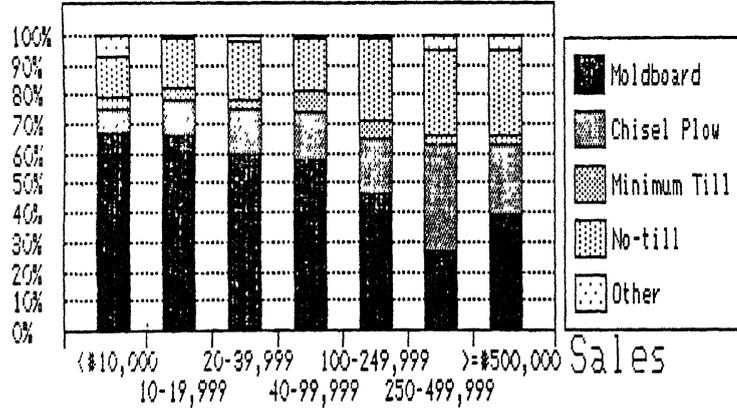


Figure 4.

### Crop Rotations by Sales

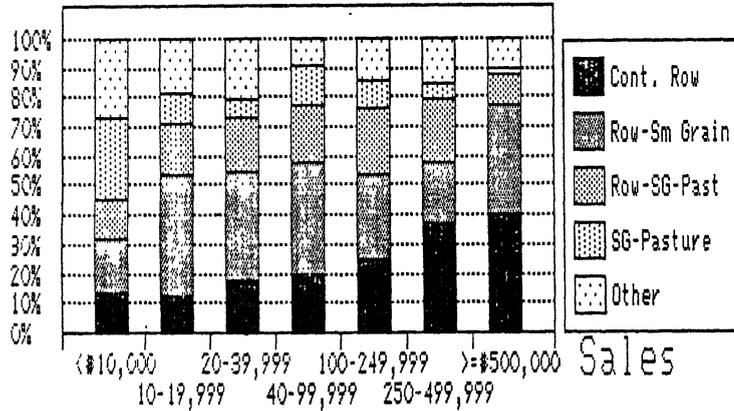
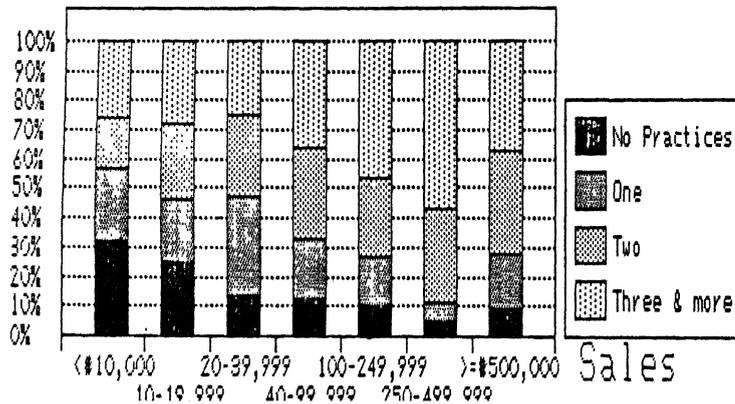


Figure 5.

### Conservation Practices Used



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\*\*\*\*\* NOTICE \*\*\*\*\*

Farm operators participating in this study will soon receive another telephone call from us. Again, they will be asked to share information about their household and farm business.

We certainly appreciated their help last year and thank them in advance for their cooperation again this year. We realize that the telephone interview takes substantial time to complete. We feel the information from these interviews is well worth the effort, and we hope the farm operators feel the same.

Farm operators are assured that all information is kept confidential. Published results use only aggregated data.

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**Farm Family Characteristics and Participation in Organizations**

January 1, 1987

This is the ninth in a series of reports describing the characteristics of nearly 1,000 farm operators surveyed by The Ohio State University in 1987. Anyone who has ever been involved in farming knows that all family members are important to the survival of the farm business, whether through their direct efforts in farm production or through their contributions to off-farm and household work. In this article we focus on the characteristics of farm operator families. Later in the article we examine farm operators' involvement in community and farm organizations.

Nearly all (98 percent) of the farm operators in our survey are men and about 90 percent are married. Other important operator background and family characteristics are displayed in Table 1. The average operator has a high school education and is about 52 years old. Spouses of farm operators (who are mostly farm wives, given our sample of male operators) have slightly higher education

levels and are somewhat younger than their husbands. These couples are committed to one another; the length of their marriages averages 27 years.

Larger commercial farms tend to be operated by younger and somewhat more highly educated operators (Table 1). As previous reports have shown, these sales classes also have the highest debt-to-asset ratios. The turbulent farm economy of the 1980's is particularly unsettling because it has hit hardest the younger, educated farmers - traditionally, those most likely to have been successful in agriculture. Operators in these high sales classes also tend to have more children living at home. This reflects the stage of the family life cycle of these younger operators. It also suggests that a future generation of farm operators has been affected by the farm crisis in the 1980's.

Spouses make important contributions to the household, both through their farm and off-farm work (Figure 1). Almost 40

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\*Ohio Farm Household Longitudinal Study is supported, in part, by the Ohio Agricultural Research and Development Center. Project staff are Lynn Forster, Robert Munoz, Linda Reif, Tom Stout, Nate Asplund, Tony Dryak, and Alex White.

percent of all married operators have a spouse who works off-farm. Spouses are somewhat more likely to work off-farm when the farm operation is smaller. They tend to work at clerical and service occupations and as teachers. About 40 percent of the operators also report that their wives performed work on the farm. Their work on the farm is especially important during planting and harvesting seasons, but their contribution to the farm business extends beyond production activities; many spouses keep financial records for the business.

Generally, farm families are active in the community. Farm operators participate in many organizations including (a) general farm organizations such as Farm Bureau, National Farmers Organization, Farmers Union, and Grange, (b) commodity organizations such as the Ohio Corn Growers, Ohio Soybean Association, and the Pork Producers, (c) local farm organizations such as the Young Farmers, (d) civic associations such as Jaycees, Elks, and Masons, and (e) boards of directors or trustees of organizations.

Most hold membership in general farm organizations (Figure 1). Of those belonging to general farm organizations, nearly two-thirds belong to the Ohio Farm Bureau, and the remainder are nearly evenly divided among Grange, National Farmers Organization, and Farmers Union. A very small proportion has membership in more than one general farm organization.

Membership in commodity organizations is not as widespread as it is in general farm organizations. However, these organizations do attract a significant proportion of the operators of larger commercial farms (Figure 2).

Local civic organization membership remains fairly constant across farm size. However, participation on boards of directors or trustees is closely related to farm size. Over 40 percent of the operators of the largest farms report membership on boards. Organizations benefit from farmer support, but farmers also benefit from interaction with others and cohesion provided by the group.

Table 1. Farm Family Characteristics.

Sales Class	Operators			Number of Children at Home	Number of Years Married
	Age	Education	Years Farming		
<\$10,000	56.1	12.3	27.0	0.9	30.3
10-19,999	53.0	12.9	26.8	1.1	27.9
20-39,999	52.7	12.4	26.9	1.1	28.1
40-99,999	47.8	12.2	22.7	1.4	23.7
100-249,999	46.1	12.6	24.0	1.5	23.0
250-499,999	48.5	13.2	25.9	2.0	25.4
<=\$500,000	48.3	13.2	26.0	1.6	24.1
All farms	51.8	12.5	25.7	1.2	27.1

Figure 1.

# Spouses Working On & Off farms

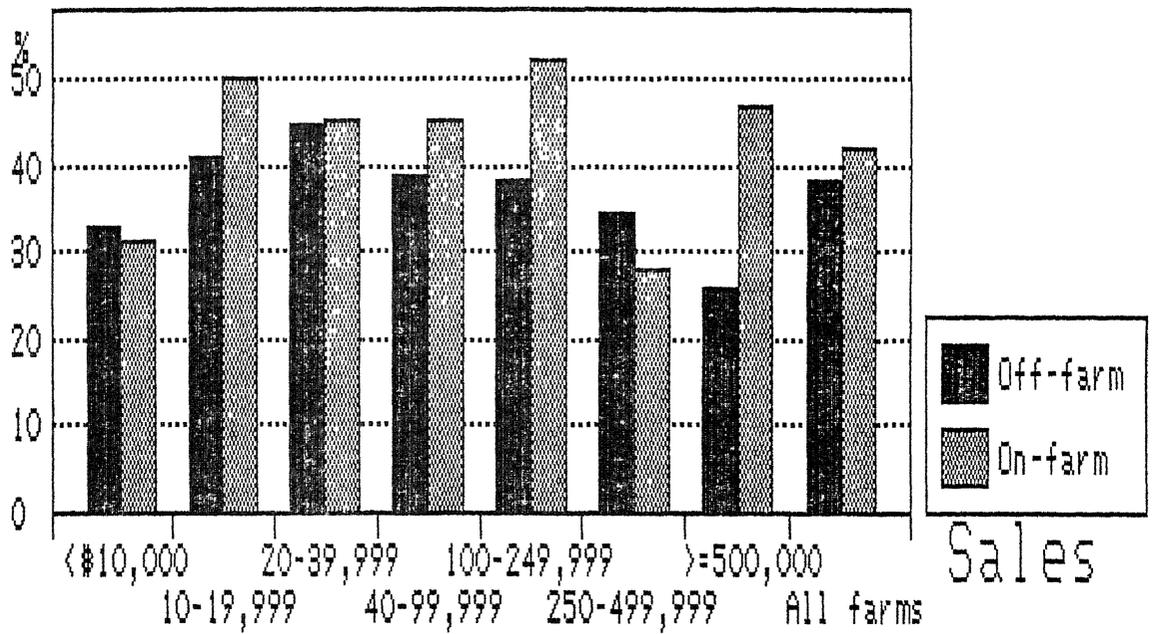
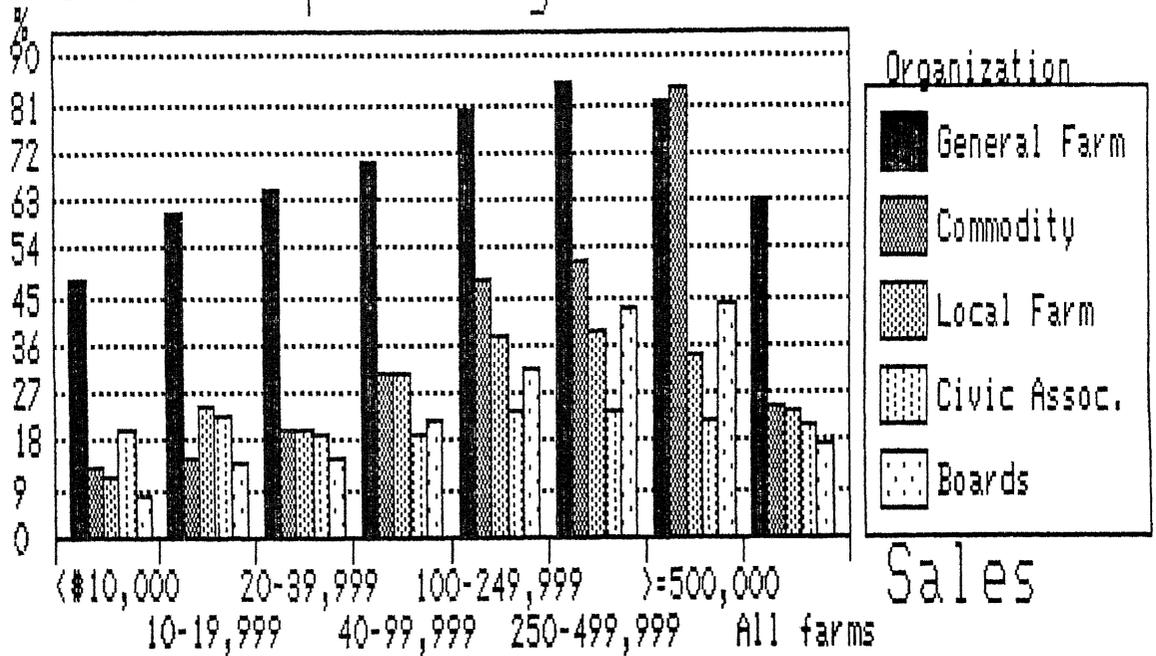


Figure 2.

# Membership in Organizations



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