

For the past five years, the Ohio Farm Household Longitudinal Study has been following the financial situation, farm production practices, off-farm employment, and other characteristics of a representative panel of about 1000 Ohio farm operator households. This report, the third in a series summarizing information collected in 1991, deals with these households' farm production and management practices and emphasizes any changes in those practices in the past five years.

Farm Size

The average farm household operated 335 acres in 1990, which was basically unchanged from 1986 (Table 1), and had gross farm sales totaling \$61,500, which was slightly less than 1986 sales (Table 2). However, these averages disguise some important changes that appear to be occurring. As earlier reports explain, farm households are quite varied in their commitment to farming. Nearly two-thirds of all Ohio farm households have small farm operations producing less than \$40,000 in gross sales annually. Their household income is primarily from non-farm sources, and they account for a only small proportion of total agricultural production. The farming operations of these "rural residences" appear to have declined during the past five years, in terms of both acreage and gross sales (Tables 1 and 2).

On the other hand, farm households with annual gross sales of \$100,000 and more appear to have increased their farm size in the past five years. These households account for only 17 percent of all farm operations, but produce more than 60 percent of the agricultural output. Average acres farmed by these "commercial farm" households increased from 779 to 807 acres (Table 1), and annual gross sales increased from \$213,800 to \$232,900 (Table 2).

Farm households with moderate size farm operations (annual gross sales of \$40,000 to \$100,000) also increased their acreage and annual gross sales. Like the "rural residence" farm households, these "part-time" farm households earned most of their household income from non-

farm sources, but they seem to have increased their commitments in farming in the past five years.

The mix of gross farm income has not changed much during the last five years, although "other" income has increased as a proportion of gross income. This reflects a build up in grain inventories held by farm operators. Payments received for participation in federal farm programs have decreased and now comprise about 6 percent of gross sales.

Cost of Production

About one-half of the cost of production is attributable to pesticides, seed, feed, and interest on debt (Table 2). Pesticides are a major production expense, and their usage has increased over the past five years despite environmental concerns. One reason for this increase is the shift from conventional tillage to conservation tillage practices (Table 3). Another notable change in production costs is reduced interest expense, which largely reflects lower interest rates.

Operators' reported depreciation is the same as that used for federal income tax purposes. Depreciation expenses decreased from 1986 to 1991 largely reflecting changes in federal income tax laws. The period of time over which machinery, buildings, and purchased breeding livestock are depreciated has been lengthened; therefore, annual depreciation rates on newly acquired depreciable assets have been reduced.

Cost per dollar sales tends to decline as farm size increases (Table 2). Some of the causes might be that overhead costs are spread over more units, technical efficiency is improved, and price discounts are received for high volume purchases. Also, a larger farm operation enables the operator to be employed full-time on the farm and have time to be more aggressive in pursuing profit enhancing management strategies.

For most Ohio farm enterprises, production technologies still enable moderately large sized firms to be competitive with larger ones. For example, the 150 sow, farrow to finish, pork

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production unit has average cost per pound which are similar to the 500 sow unit. The 100 cow dairy herd can compete effectively with the 300 cow herd. Thus, farm businesses in Ohio remain largely sole proprietorships or partnerships owned by a few family members. A few large poultry and swine farms are corporate owned, but these are exceptions to the family farm structure seen over most of the state.

Tenure and Land Use

As households are more heavily engaged in farming, they tend to own a smaller proportion of their acreage, and to leverage their capital, equipment, and labor by leasing farm land (Table 1). Corn and soybeans dominate land use, especially on larger farm operations (Table 1). On "rural residence" operations, corn and soybean acreage has diminished somewhat in the past five years, but these continue to be important crops.

Production Practices

Although conventional tillage (moldboard plow followed by secondary tillage operations) is

still the major tillage system, there has been a shift to less erosive tillage practices, especially on larger farm operations (Table 3). Conservation tillage practices are now the predominant tillage system on almost two-thirds of the "commercial farm" operations. Little change occurred in the adoption of conservation tillage practices on "rural residence" operations.

Crop rotations that include small grains or pasture with row crops predominate (Table 3). However, a notable change in production practices in the past five years has been a movement away from continuous row crops on larger farm operations (Table 3). This change is consistent with the increased wheat and hay acreage reported by these same operations (Table 1).

These two important changes in production practices - more use of conservation tillage and less use of continuous row crop rotations - should have reduced soil erosion and nonpoint water pollution from Ohio farms.

Table 1. Distribution of Acres Operated , by Farm Size, 1986 and 1990

	1986, by Gross Sales				1990, by Gross Sales			
	Less than \$40,000	\$40-100,000	\$100,000 and more	All Farms	Less than \$40,000	\$40-100,000	\$100,000 and more	All Farms
Acres Operated	245	427	779	336	187	465	807	335
Percent of acres								
- owned	56	41	40	50	70	40	41	52
- rented	44	59	60	50	30	60	59	48
Percent of acres in selected crops								
- corn	23	30	36	28	19	25	35	27
- soybeans	25	31	25	25	19	29	28	25
- wheat	7	8	6	6	7	12	11	10
- hay	11	9	9	10	10	9	7	9
- other	34	22	24	31	44	26	19	30

Management Services and Marketing Tools

Information and managerial assistance are sought from a variety of sources including accountants, attorneys, and financial and marketing consultants (Table 4). Over the past five years, little change has occurred in the use of these professionals. As expected, the larger farm operators are more likely to hire these services than are the "rural residents," whose use of these services probably parallels that of non-farm households.

The use of computers has nearly doubled for all three groups of farm households (Table 4).

Over one-third of the "commercial farm" households have computers and use them in managing their farm operations.

Marketing tools such as forward contacting, delayed pricing, hedging, and options enable operators to develop marketing strategies that assert some control over price risk and terms of sale. Forward contracting and delayed pricing are the most used marketing tools, and their use has increased slightly in the past five years. Again, commercial farm operators are more likely to use these tools than are operators of smaller farms.

Table 2. Distribution of Gross Farm Product Sales

	1986, By Gross Sales				1990, By Gross Sales			
	Less than \$40,000	\$40,000 -\$100,000	\$100,000 or more	All Farms	Less than \$40,000	\$40,000 -\$100,000	\$100,000 or more	All Farms
Gross Sales (\$000)	18.6	70.6	213.8	62.3	16.1	73.3	232.9	61.5
Percent of Gross Sales from								
-crops	40	42	35	37	40	44	30	35
-livestock	34	39	49	43	33	31	50	44
-government payments	7	9	9	8	8	5	5	6
-other ^a	19	10	7	12	19	20	15	15
Cost per \$ Sales	1.43	0.88	0.86	0.98	1.26	0.90	0.81	0.91
Percent of Cost From								
-Pesticides & Fertilizers	12	19	15	15	18	20	16	18
-Interest	10	11	13	12	8	9	9	9
-Depreciation	16	18	14	16	17	14	11	13
-Hired Labor	2	3	3	3	2	3	5	4
-Seed & Feed	10	15	18	15	12	17	20	17
-Livestock	2	6	12	8	2	3	6	4
-Other	48	28	25	31	41	34	33	35

^aOther includes imputed rental value of residence, rentals, and inventory change.

Financing the Farm Operation

Farms are capital intensive. The average value of farm household assets was over \$400,000 on December 31, 1990, and most of these assets were committed to the farming operation. Operators must finance these assets by using either equity capital or debt, and equity is the principle source of capital.

Farm households face enormous risk due to price instability, weather, pests, disease, and changing macroeconomic forces such as foreign exchange rates and interest rates, and international political events. Financing a business in this risky climate with debt capital heightens risk. Thus the degree of debt financing in farming is relatively modest. For example, while the average debt-to-asset ratio was 0.11 for Ohio farm households at the end of 1990, it averaged about 0.60 for all U.S. industrial corporations.

At the end of 1986, 7 % of all farm households and 15 % of commercial farm households had debt-to-asset ratios above 0.7, which placed them in the "severe financial stress" category. Now, five years later, only 2 % of all farm households and 7 % of commercial farm households are in this category. Some financial "healing" has occurred in the industry.

In general, farm households are in a strong financial position. Over 80 % of commercial farm households and 90 % of all farm households have debt-to-asset ratios of 0.4 or less and are relatively conservative in their approach to financing their farm businesses.

Summary

When examining the array of production, marketing, and financing practices used on Ohio farms, it is apparent that commercial farm operations are quick to respond to changing conditions. Larger farm operations tend to be the ones that adopt conservation tillage, use innovative marketing tools, aggressively seek information, and find uses for computers in their operations. They are also more likely to lever their own resources by renting farm real estate and acquiring debt. In the final analysis, this aggressive management style help lower their cost of production and improve their profitability.

Table 3. Distribution of Cropping Practices, by Farm Size, 1986 and 1990.

	1986, by Gross Sales				1990, by Gross Sales			
	Less than \$40,000	\$40- \$100,000	\$100,000 and more	All farms	Less than \$40,000	\$40- \$100,000	\$100,000 and more	All farms
Percent of Farms by Predominant Tillage Systems Used								
-Conventional	63	58	43	59	57	50	37	53
-Conservation	34	39	55	38	34	46	62	40
-Other	3	3	2	3	9	4	1	7
Percent of Farms by Predominant Crop Rotation Used								
-Continuous Row Crop	15	20	27	17	16	11	15	15
-Row Crop/Small Grain	31	38	27	31	34	48	43	38
-Other, Including Rotation with Pasture or Hay	54	42	46	52	50	41	42	47

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Ohio Farm Household Longitudinal Study
Dept. of Agricultural Economics and Rural Sociology
The Ohio State University
2120 Fyffe Road, Room 238
Columbus, Ohio 43210-1099