Ohio Farm Household
Longitudinal Study*

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IMPACTS OF THE 1988 DROUGHT ON OHIO FARMS

The 1988 drought was the worst since the mid 1930s. As a result, many observers expected farm incomes to decline and farm financial structures to erode. This report examines these concerns as well as the drought's impacts on yields, herd sizes, and feed costs. Moreover, evidence regarding changes in managerial practices is presented.

Data for these analyses come from the Ohio Farm Longitudinal Study. This study surveys 900 farms statistically selected to be representative of Ohio's production agriculture. This report is part of a continuing series reporting results from the study.

Only farms whose gross sales are greater than $40,000 are included in this report. This cutoff is selected in order to focus on "commercial" farms and to exclude households receiving most of their income from off-farm sources. Results are presented for all commercial farms and for grain, dairy, and swine farms. The three farm types have over 50 percent of gross receipts coming from the dairy, grain, or swine enterprise.

Impacts on Yields, Herd Sizes, and Governmental Assistance

In 1988, 21 percent of the farms replanted some of the crop (Table 1). Corn yields averaged 80 bushels per acre, soybeans averaged 31 bushels per acre, and hay averaged 5.1 tons per acre for the surveyed farms. Corn yields were 37 percent below expected yield, while soybean yields were down 32 percent. Due to yield reductions, 10.9 percent of all farms were unable to deliver some forward contracted grain. Approximately two percent of all forward contracted grain was undelivered.

Dairy and swine farms both reduced herd sizes on average by 4.3 percent. At the same time, because of drought-reduced output of feed, dairy farms increased feed purchases by 6.2 percent and swine farms by 1.9 percent. The larger percent for dairy farms was due primarily to smaller hay yields, leading to more forage purchases.

Drought disaster assistance was received by 27.8 percent of all farms during the 1988 calendar year. These farms received an average of $5,464, yielding an average disaster assistance for all farms of $1,519. Of the farms receiving disaster assistance, grain farms ($7,331) received more per farm than did dairy farms ($3,513) and swine farms ($1,767).

Financial Impacts of the Drought

Financial impacts are measured by comparing financial measures for 1986 and 1988. The year 1986 is used because yields were near normal over most of the state. Comparing yearly financial measures does not totally capture financial impacts of a drought because many factors influence financial performance. For example, prices change for many reasons; but yearly financial measures will provide an overall indicator of financial performance in drought and non-drought years.

Financial measures examined are average net farm incomes, average debt-to-asset ratios, and percent of farms in financial stress. Net farm income equals all farm receipts, minus expenses including depreciation, plus inventory adjustments. It represents the return to family capital, labor, and management. The debt-to-asset ratio equals debt divided by assets of the farm household. It is a measure of solvency and financial stress, with stress

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increasing as the debt-to-asset ratio increases. Conventional wisdom suggests that farms with debt-to-asset ratios of greater than 0.4 are facing financial stress and those above 0.7 are facing severe financial stress.

Overall, net farm income was higher in 1988 than in 1986. Average net farm income for all farms was $21,844 in 1988 compared with $20,172 in 1986 (Table 2). Note, the average disaster assistance payment per farm is almost equal to the increase in average net farm income. The debt-to-asset ratio was 0.16 in 1988, which was lower than the 1986 figure of 0.19. Percentage of farms having a debt-to-asset ratio greater than 0.7 declined from 9.4 percent in 1986 to 6.5 percent in 1988. These measures suggest that the drought did not adversely affect the financial health of Ohio farms on average.

However, the drought may have had differential impacts on different farm types. Grain farms fared quite well during 1988, averaging $28,803 of net income as compared to $18,959 in 1986. This increase was primarily due to higher commodity prices which more than offset yield declines. Ohio average corn yields declined by 33 percent between 1986 and 1988, but the average price received for corn increased by 73 percent. Similarly, soybean yields declined 33 percent while prices increased 55 percent.

The increase in crop prices illustrates a natural risk protection offered by commodity markets. As overall yields decline, the total quantity of grain available decreases. The price increases due to the typical demand relationship. Opposite movements in prices and yields tend to mute total revenue changes on farms. In fact, prices tend to increase relatively more than quantity decreases because of the price inelasticity of farm commodities.

Partially offsetting this natural risk protection are declines in government corn deficiency payments. These payments, which are based on the difference between the corn target price and market price, declined during crop year 1988 due to higher market prices. The 1988 net farm income figure in Table 2 does not reflect this fact because no adjustment is made for crop year 1988 deficiency payments received in calendar year 1989 due to rules governing the timing of deficiency payments. The loss in calendar year 1989 deficiency payments because of the 1988 drought likely will average $1,000 - $1,500 per farm on a statewide basis.

Net farm income received by dairy farms decreased from $26,105 to $25,840 between 1986 and 1988. Higher feed costs due to the drought were a factor. Swine farm net income declined from $27,855 to $13,529 between 1986 to 1988. Higher feed costs and lower hog prices were both factors. Lower hog prices should not be totally attributed to the drought because they had declined before the drought. The extent to which the drought influenced hog prices is not known, but the drought did adversely affect swine farm income due to higher feed costs.

Declining net farm incomes for livestock farms stand in marked contrast to the increasing grain farm income. The natural protection offered by commodity markets to grain farms is a hindrance to livestock farms because the cost of feed increases. Thus, the major financial impacts of the 1988 drought were felt by livestock, not grain, farms, at least during the year of the drought.

Farmer Responses to the Drought

Farmers were asked what changes they intended to implement as a result of the drought. Of the options given, the most quoted response was to purchase crop insurance. Thirty-six percent of all farmers indicated that they intended to purchase crop insurance in 1989 (Table 3). This compares to 12 percent who purchased crop insurance for the 1988 crop. Some farmers undoubtedly intended to purchased crop insurance in 1989 in order to qualify for disaster assistance.

Twenty-nine percent of all farmers indicated a greater reluctance to forward contract grain. Grain farmers were more hesitant than were other farmers, probably because they more actively use forward contracting. Twenty-four percent of farmers indicated they would change tillage practice, with 9 percent indicating use of more conservation tillage and 15 percent indicating use of less conservation tillage. The small net change suggests that early-summer concerns with no-till crops did not materialize. Moreover, the diversity of responses suggests that no tillage system was dominant during the drought. Few farmers purchased irrigation systems (3.4 percent) or planned to change crop rotation (8.5 percent).

Twenty-three percent of farmers had to borrow more money because of the drought. In addition, five percent of all farm families had at least one family member take an off-farm job because of the drought.

Summary

While the 1988 drought dramatically reduced yields, its impact on average financial performance of Ohio farms was less dramatic. Net farm income was higher for grain farms, but lower for dairy and swine farms. Few changes in production practices are contemplated because of the drought. The major changes are a hesitancy to forward contract grain, an increase in crop insurance use, and an increase in borrowed funds.

Table 1. Drought Impacts on Selected Farm Types, Ohio, 1988[1].

		Farm Type		
	All	Grain	Dairy	Swine
Farms That Replanted Crops (%)	21.1	27.5	15.4	17.2
Yields in 1988				
Corn (bu./A.)	80.0	88.0	71.7	78.9
Soybeans (bu./A.)	30.8	29.1	28.6	27.4
Wheat (bu./A.)	51.3	51.0	49.9	52.5
Yield Loss				
Corn (bu./A.)	46.0	43.3	47.1	46.5
Soybeans (bu./A.)	14.5	15.4	12.0	14.1
Farmers Unable to Deliver Forward contracted grain (%)	10.9	11.8	8.2	11.2
Reduction in herd size (%)				
Dairy	na[2]	na	4.3	na
Swine	na	na	na	4.3
Increase in feed purchases (%)	7.5	9.0	6.2	1.9
Farms receiving drought disaster assistance in 1988 (%)	27.8	24.8	26.3	22.7
Drought assistance per farm	$1,519	$1,818	$ 924	$ 401
Farms That Harvested Set-Aside or Conservation Reserve Acres (%)	48.9	44.1	49.2	28.1

[1]Includes only farms with gross income over $40,000.
[2]Not applicable.

Table 2. Net Income and Financial Position of Selected Farm Types, Ohio, 1986 and 1988[1].

	Year 1986	Year 1988
ALL FARMS		
Net Farm Income ($)	$20,172	$21,844
Debt-To-Asset (D/A) Ratio[2]	0.19	0.16
Farms having D/A ratios greater than .7(%)	9.4	6.5
GRAIN FARMS		
Net Farm Income ($)	$18,959	$28,803
Debt-To-Asset (D/A) Ratio[2]	0.19	0.20
Farms having D/A ratios greater than .7(%)	10.3	9.8
DAIRY FARMS		
Net Farm Income ($)	$26,105	$25,840
Debt-To-Asset (D/A) Ratio[2]	0.16	0.12
Farms having D/A ratios greater than .7(%)	4.4	0.0
SWINE FARMS		
Net Farm Income ($)	$27,855	$13,529
Debt-To-Asset (D/A) Ratio[2]	0.29	0.22
Farms having D/A ratios greater than .7(%)	26.7	9.1

[1]Includes only farms with gross income over $40,000.
[2]Debt-to-asset ratios are computed from the December 31st balance sheets for farms in the sample.

Table 3. Farm Operator Responses to the 1988 Drought, Ohio, 1988[1].

	All Farms	Farm Type: Grain	Farm Type: Dairy	Farm Type: Swine
	Percent of Farms			
Intend to buy crop insurance	36.8	36.1	27.9	50.8
Are more hesitant to forward contract	29.4	40.2	18.1	26.4
Plan to change tillage				
more conservation till	9.4	8.7	9.9	7.5
less conservation till	14.7	13.5	13.7	15.0
Plan to change crop rotation	8.5	8.8	10.0	4.2
Borrowed more money	23.3	26.7	20.2	33.8
Took an off-farm job	4.8	5.1	3.3	10.9
Purchased irrigation equipment	3.4	3.1	2.6	5.5

[1]Includes only farms with gross income over $40,000.

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