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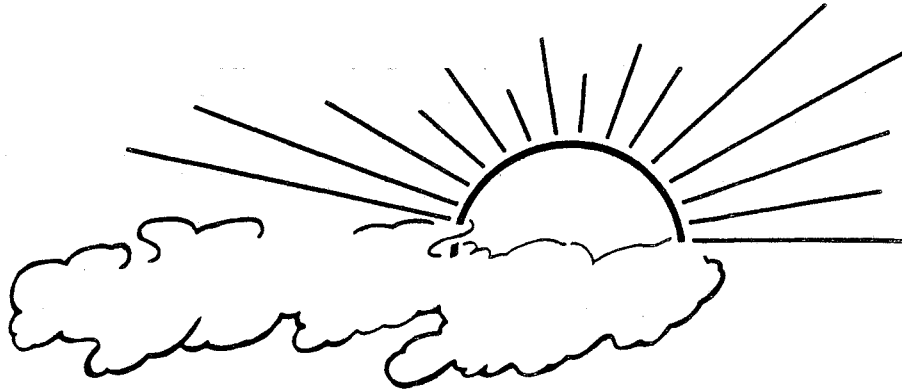
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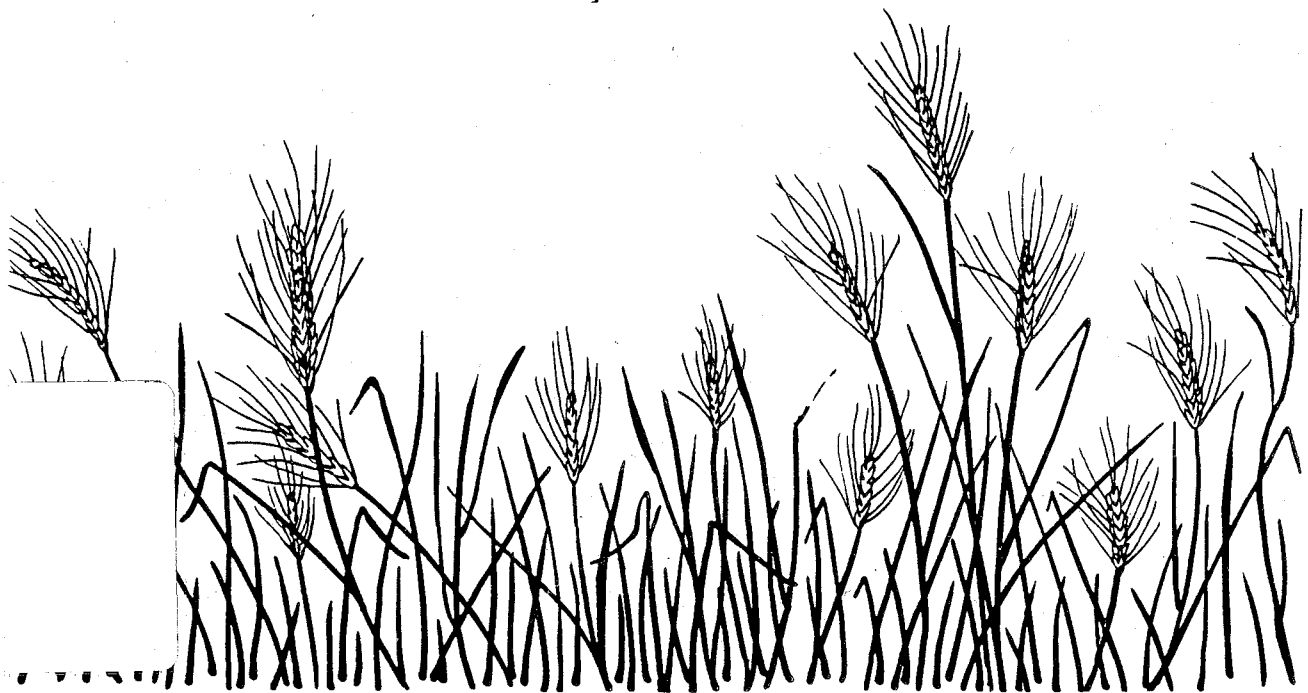
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# **Economic Effects of the 1988 Drought in North Dakota:**

*A 1989 Update of the Financial Conditions  
of Farm and Ranch Operators*

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## Acknowledgements

A number of people and organizations have graciously given of their time and talents to help us compile and analyze the data in this report. Our appreciation is expressed first to the Agriculture and Rural Economics Division of the Economic Research Service (USDA) and the Center for Rural Revitalization (NDSU Extension) for providing partial financial support for the project and to Fred Hines and Arlen Leholm of those respective organizations for their encouragement throughout the course of the study. A special thanks go to the 466 North Dakota farm and ranch operators who provided us with information to help us all better understand current economic conditions in agriculture and the effects of the drought. These 466 individuals have been with us through four extensive telephone surveys; our appreciation to them cannot be measured.

Our thanks also go to Arlen Leholm (NDSU Extension Center for Rural Revitalization), Steve Murdock and Rita Hamm (Texas A&M Department of Rural Sociology), and Dwight Aakre (North Dakota Extension Service) for their assistance in designing the survey and study procedures.

Our appreciation is next extended to our outstanding crew of surveyors who faithfully called night after night seeking information about our farm and ranch operators: Holly Pherson, Barb Bauer, Fran Zimmerman, Bonnie Erickson, Betty Butenhoff, Betty Heier, Cindy Vanderwerff, Cindy Bartuska, LeAnn Rage, John Leholm, and Julie Fedorenko.

Next we thank the North Dakota Agricultural Experiment Station, the North Dakota Extension Service, and their professional and support personnel. In particular, we thank our typists Carol Jensen and Mary Altepeter, and our colleagues in the Department of Agricultural Economics for their helpful reviews and suggestions.

As always, our gratefulness to these individuals and entities does not implicate them for any remaining errors or omissions.

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## **Highlights**

The year 1988 was characterized by the most severe drought conditions that the state had faced since the 1930s. The purpose of this study was to document (1) the extent to which producers were aided by the various forms of drought assistance and (2) the overall effects of the unusual conditions of 1988 on the financial status of farmers and ranchers in North Dakota. Information to address these and related issues was drawn from the 1989 update of the North Dakota longitudinal farm panel study. This report is based on data from 466 producers who provided information in each of the four surveys since 1985. Key results are as follows:

- Survey respondents reported drought losses that averaged 71 percent for small grains, 59 percent for row crops, 68 percent for hayland, and 60 percent for pasture. About 45 percent of the producers with livestock reduced their herd by an average of 28 percent as a result of the drought.
- Drought assistance was received by more than 91 percent of survey respondents. Of those receiving drought aid, 98 percent received crop disaster payments, and these payments averaged \$14,918 per producer. About 14 percent of these producers also received Emergency Feed Program aid (\$827 average), and about 6 percent obtained help from the Emergency Feed Assistance Program (\$211 average). The average total disaster payment was \$15,234; the median amount was \$11,000. If producers had not received any aid, the average net cash farm income would have been only \$6,266, and nearly 40 percent of the producers would have had a negative net cash farm income.
- All-risk crop insurance also helped compensate for the drought losses of some producers. About 61 percent of the respondents were covered, and they received an average of \$12,332 in loss payments. Producers generally believed that crop insurance and drought assistance payments combined covered about half of their losses, but responses ranged widely.
- Gross farm income, depreciation, and interest expenses for 1988 were slightly less than those for 1987. Government farm program payments (not including drought aid payments) fell about 23 percent from their 1987 level. Net cash farm income was almost the same in 1988 as in 1987 (about \$21,300), although there were some regional differences particularly in the west.
- The level and composition of total family income for the respondents changed only slightly from 1987 to 1988. Earnings from off-farm employment and other off-farm income were up slightly, while farm income and revenues from mineral leases showed slight decreases.
- Asset values in 1988 were up slightly (about 1 percent) from their 1987 level, the first increase in asset value since the panel study began. The increase results in large measure from the slight increase in land values that occurred in 1988. Producers also succeeded in reducing their outstanding debt by about 3.8 percent, the second straight year that substantial reductions had been achieved. Thus, the average net worth of producers increased for the first time since the early 1980s.



- *Nevertheless, the average debt-to-asset ratio continued to rise in 1988 although the median value fell slightly. A few producers with very high debt levels, including some who are insolvent, influenced the mean value substantially. By the end of 1988, however, fewer producers were in the very highly leveraged category with debt-to-asset ratios of 0.7 or higher. Only 15 percent of North Dakota producers fell into this category at the end of 1988 compared to 19.9 percent a year earlier.*
- *Despite the drought, producers surveyed had not changed their general outlook substantially from the previous year. About 27 percent felt they were likely to expand their operation over the next three years, and about 84 percent were confident they could continue to farm for at least three years. While only about 30 percent were satisfied with current financial returns in farming, almost 84 percent expressed satisfaction with farming as an occupation, and almost two-thirds were satisfied with farming overall.*

*In the face of drought conditions of historic proportions, most North Dakota farmers and ranchers experienced improved financial conditions in 1988. Both gross farm income and net cash farm income were down only slightly, and producers managed to reduce their total debt by about 4 percent.*

*The drought will have long-term implications for many producers. Drought conditions led many producers to reduce their livestock herds and feed inventories, while others sold stored grain in response to rising prices. The effects of these actions will be felt in the years ahead, particularly if drought conditions continue into 1989.*

# **Economic Effects of the 1988 Drought in North Dakota: A 1989 Update of the Financial Conditions of Farm and Ranch Operators**

F. Larry Leistritz, Brenda L. Ekstrom,  
Janet Wanzek, Timothy L. Mortensen\*

The year 1988 was a uniquely challenging one for North Dakota's farm and ranch operators. Following on the heels of a series of years during which low commodity prices, high interest rates, and falling land values had placed severe economic pressure on many operators, 1988 was characterized by the most severe drought conditions that the state had faced since the 1930s. Congress responded to the widespread drought by enacting the Disaster Assistance Act of 1988, which became law on August 11 and provided several forms of aid to producers (Dyson 1988). In addition, some forms of assistance had already been authorized under existing USDA programs.

In the wake of the drought, many policymakers are interested in the extent to which producers were aided by the various forms of drought assistance. Further, there is widespread interest regarding the overall effects of the unusual conditions of 1988 on the financial status of farmers and ranchers. Crop and pasture losses are known to have varied substantially across the state, and the extent of drought aid received also was quite variable. In addition, producers who had substantial amounts of stored grain could have benefited from drought-induced price increases. Thus, some producers suffered severe financial setbacks, while others benefited financially from the drought conditions.

## **Study Procedures**

Information to address these and related issues was drawn from the 1989 update of the North Dakota longitudinal farm panel study. This study began in 1985 when 933 farm and ranch operators were contacted by telephone regarding their 1984 financial situation and socioeconomic characteristics. Initial screening questions were incorporated into the 1985 survey to ensure that all respondents were less than 65 years old, were operating a farm, considered farming to be their primary occupation, and sold at least \$2,500 of farm products in 1984 (Leholm et al. 1985). These producers were subsequently contacted in 1986, 1988, and 1989 and asked to provide financial information for the previous year. This report is based on data from 466 producers who provided information in each of the four surveys.

Selected characteristics of survey participants are compared to data from the 1982 Census of Agriculture in Table 1. The distribution of farms by State Planning Region (see Figure 1) compares quite closely not only among the four surveys but also between the surveys and the 1982 Census count for farms whose operators reported farming as their principal occupation. The age distribution is quite similar between the initial survey and the Census, and subsequent surveys reflect the aging of the farm population together with the fact that there was no procedure for adding new farming entrants to the panel.

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TABLE 1. DISTRIBUTIONS OF NORTH DAKOTA FARMS BY STATE PLANNING REGION, ACRES OPERATED, AND AGE OF OPERATOR FROM 1982 CENSUS OF AGRICULTURE, AND THE 1985, 1986, 1988, AND 1989 FARM OPERATOR SURVEYS

Item	1982 Census <sup>a</sup>	1985 Survey <sup>b</sup>	1986 Survey <sup>b</sup>	1988 Survey <sup>b</sup>	1989 Survey <sup>b</sup>
	-----percent-----				
Region:					
1	6.2	4.9	5.0	3.6	3.9
2	14.9	15.1	14.9	13.6	13.1
3	11.0	10.9	10.4	10.4	10.9
4	9.7	9.8	9.0	8.1	8.6
5	13.4	13.2	13.4	13.8	15.2
6	17.8	17.9	17.9	17.8	17.4
7	17.4	17.9	18.3	20.5	19.7
8	9.7	10.3	11.1	12.2	11.2
Age:					
Less than 25	6.2	2.6	0.0	0.0	0.0
25 to 34	20.1	20.2	18.7	16.1	14.4
35 to 44	20.2	25.2	24.5	25.0	23.7
45 to 54	24.9	24.1	23.7	24.1	23.2
over age 55	28.7	28.0	31.6	34.8	38.7
Acres operated:					
Less than 180	7.8	1.5	2.2	1.7	3.0
180 to 499	14.6	7.7	8.1	8.2	9.0
500 to 999	28.9	26.4	26.1	26.1	23.2
1,000 to 1,999	33.3	39.1	41.4	42.4	41.2
2,000 or more	15.5	25.3	22.2	21.6	23.6

<sup>a</sup>Source: U.S. Bureau of the Census 1982. Includes only farms whose operator reported farming as his/her principal occupation and whose operator's age was less than 65.

<sup>b</sup>Includes only farms whose operator reported farming as his/her principal occupation and whose operator's age was less than 65 at the time of the 1985 survey. For the 1986 survey, this includes 10 operators (1.3 percent) who were 65 years old at the time of the survey, for the 1988 survey it includes 51 (9.2 percent) who were 65 and over, and for the 1989 survey it includes 9.5% who were 65 and over. As the original panel was subsequently resurveyed, producers were not excluded because of age.

Comparison of the distributions of acres operated reveals that the survey distributions are similar but that all four surveys included a smaller percentage of small farms (less than 500 acres operated) than are represented in the Census. A likely explanation is that many of these smaller units were operated by individuals (excluded from the survey) who were over 65 years of age or who did not consider farming to be their principal occupation. This would also explain the higher percentage of survey farms in the two largest size classes.

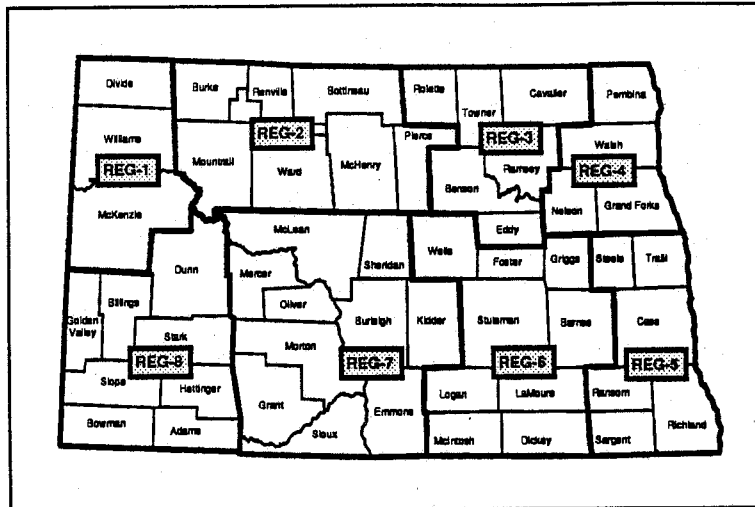


Figure 1. Eight State Planning Regions in North Dakota.

The remainder of this report is organized into four parts. First, changes in the farm operation and family situation of respondents are briefly examined. Then, effects of the drought and drought assistance programs are examined. Third, the financial situation of farm and ranch operators is assessed by examining their income for 1988 and their balance sheet data as of December 31, 1988. Results are compared with those of the 1988 and 1986 surveys. Finally, producers' outlook for the future of their farming operation is examined, and their use of Extension information is reviewed.

### Farm and Family Characteristics

Selected characteristics of survey respondents and their families are shown in Table 2. In general, characteristics reported in 1989 were similar to those from the earlier surveys. The slight changes in household size and number of children at home most likely reflect the gradual aging of the panel group.

Total acres operated by the farm panel members had changed only slightly (-1.1 percent) between the 1986 and 1989 surveys (Table 3). The percentage of respondents who reported that the majority of their income came from livestock had increased and likely reflects the general strengthening of livestock prices over the period. Just over one-fourth of the 1989 respondents indicated that land they owned or (had) operated had been entered into the Conservation Reserve Program (CRP). An average of about 222 acres had been enrolled, with 1988 being the year when land was most often enrolled.

### Effects of 1988 Drought

Survey respondents reported drought losses that averaged 71 percent for small grains, 59 percent for row crops, 68 percent for hayland, and 60 percent for pasture (Table 4). About 45 percent of the producers with livestock reported reducing their herd as a result of the drought. The average reduction was about 28 percent. Over half (53 percent) of these producers would like to rebuild their herds in 1989 if conditions are favorable.

TABLE 2. FAMILY CHARACTERISTICS OF SURVEY RESPONDENTS, 1986, 1988, AND 1989

Item	Unit	1986 Survey	1988 Survey	1989 Survey
Marital status:				
Single	Percent	10.7	8.7	8.5
Married	Percent	87.3	88.5	89.4
Separated or divorced	Percent	1.3	1.7	1.3
Widowed	Percent	0.7	1.1	0.9
Number of persons living at residence:				
Mean	Number	3.5	3.4	3.3
Distribution:				
1	Percent	3.7	4.5	5.2
2	Percent	26.9	28.8	33.8
3	Percent	22.5	24.3	20.3
4	Percent	21.7	20.6	16.8
5 or more	Percent	25.2	21.9	23.9
Number under age 19:				
Mean	Number	1.2	1.2	1.0
Number under age 5:				
Mean	Number	0.3	0.3	0.2
Residence in 1989:				
Same as 1988	Percent	NA	NA	97.4
Different than 1988	Percent	NA	NA	2.6

NA = not available.

TABLE 3. FARM CHARACTERISTICS OF SURVEY RESPONDENTS, 1986, 1988, AND 1989

Item	Unit	1986 <sup>a</sup> Survey	1988 <sup>a</sup> Survey	1989 Survey
Acres owned (mean) <sup>b</sup>	Number	762.8	783.7	742.6
Acres rented to others (mean) <sup>b</sup>	Number	20.3	34.9	35.1
Acres rented from others (mean) <sup>b</sup>	Number	836.9	815.9	848.2
Total acres operated (mean) <sup>b</sup>	Number	1,579.4	1,572.6	1,560.2
Enterprises that provided 50 percent or more of gross income:				
Crops	Percent	68.0	60.9	61.9
Livestock	Percent	18.7	23.4	26.8
Neither	Percent	13.3	15.7	11.3
Has land owned or operated been entered into CRP?				
Yes	Percent	NA	15.1	25.5
No	Percent	NA	84.7	74.5
Don't know	Percent	NA	0.2	0.0
Year land was entered into CRP:				
1986	Percent	NA	4.4	6.0
1987	Percent	NA	76.5	32.5
1988	Percent	NA	19.1	50.4
1989	Percent	NA	0.0	11.1
Number of acres enrolled:				
Mean	Number	NA	214.8	221.6
Distribution:				
0-99	Percent	NA	30.4	31.9
100-199	Percent	NA	29.0	27.6
200-499	Percent	NA	31.9	30.2
500 or more	Percent	NA	8.7	10.3

<sup>a</sup>Values for 1986 and 1988 are for those respondents who provided information for all three years.

<sup>b</sup>Average (mean) values are computed for all respondents, including those who did not own (or rent) any land.

NA = not available.

TABLE 4. DROUGHT LOSSES EXPERIENCED IN 1988

Item	Value	Item	Value
	(percent)		(percent)
Percent loss for small grain:		Percent loss for hayland:	
Mean	71.1	Mean	68.1
Median	75.0	Median	75.0
Distribution:		Distribution:	
Zero to 25	4.7	Zero to 25	8.0
26 to 50	22.8	26 to 50	21.2
51 to 75	29.8	51 to 75	29.9
76 to 90	16.7	76 to 90	23.0
91 to 100	26.0	91 to 100	17.9
Percent loss for row crops:		Percent loss for pasture:	
Mean	58.5	Mean	59.6
Median	60.0	Median	60.0
Distribution:		Distribution:	
Zero to 25	20.1	Zero to 25	10.8
26 to 50	26.5	26 to 50	37.7
51 to 75	20.9	51 to 75	24.5
76 to 90	9.2	76 to 90	9.2
91 to 100	23.3	91 to 100	17.8
Did respondent have to reduce livestock herd size as a result of drought?		Does respondent intend to rebuild in 1989 if conditions are favorable?	
Yes	45.2	Yes	53.4
By what percentage was herd reduced?		Did respondent cut hay on CRP acres in 1988?	
Mean	28.4	Yes	13.9
Median	22.0		
Distribution:			
0.01 to 10	18.0		
10.01 to 25.00	49.2		
25.01 to 50.00	26.2		
50.01 to 100	6.6		

One step taken by the USDA to assist drought-stricken producers was to allow producers to cut hay from CRP acres. About 14 percent of the respondents reported that they had cut hay on CRP land in 1988.

A number of other forms of drought assistance were also extended to producers. These included some that were authorized under earlier legislation and others that were incorporated in the Disaster Assistance Act of 1988 (for a detailed discussion, see Dyson 1988). Major forms of drought assistance that were available to producers included crop disaster payments, the Emergency Feed Program, and the Emergency Feed Assistance Program.

Crop disaster payments for farmers participating in the wheat and feed grain programs were 65 percent of the target price for losses between 35 and 75 percent and 90 percent of the target price for losses over 75 percent. Producers who were not in the government program in 1988 could claim 65 percent (for losses of 35 to 75 percent) or 90 percent (for losses over 75 percent) of the average price based on the county loan rate. Producers of soybeans and nonprogram crops could make similar claims based on the three-year average price received by the operator for these crops.

The Emergency Feed Program and Emergency Feed Assistance Programs were authorized under previous legislation but expanded by the Disaster Assistance Act of 1988. Under the terms of the expanded programs, the Emergency Feed Program would allow producers to obtain cost reimbursement for 50 percent of the cost of feed purchased and of the cost of transporting the feed or of moving cattle to or from grazing lands. The Emergency Feed Assistance Program allowed sale of CCC stocks to eligible producers at a price not to exceed 75 percent of the county loan rate and donation of CCC feed grain stocks to producers deemed unable to pay. To be eligible for the feed programs, producers must reside in a county that had been designated a natural disaster area (all North Dakota counties were so designated in 1988). The programs also were limited to livestock producers who normally grow all or part of their own feed.

Other limitations of the programs related to producer gross income and maximum payment limits. To receive emergency crop loss assistance, producers' gross revenues were required to be less than \$2 million. Payments could not exceed \$100,000, and assistance received under the livestock emergency programs counted toward that total (Dyson 1988). The livestock programs were limited to producers with annual gross revenue of less than \$2.5 million, and program benefits were limited to \$50,000 per person.

Drought assistance was received by more than 91 percent of survey respondents (Table 5). Of those receiving drought aid, 98 percent received crop disaster payments, and these payments averaged \$14,918 per producer. About 14 percent of these producers also received Emergency Feed Program aid (\$827 average), and about 6 percent obtained help from the Emergency Feed Assistance Program (\$211 average).

Disaster payments proved to be the key to survival for many operators. The average total disaster payment (including crop disaster payments, Emergency Feed Program aid, and Emergency Feed Assistance Program aid) was \$15,234 (Table 6); the median amount was \$11,000. If producers had not received any aid, the average net cash farm income would have been only \$6,266, and nearly 40 percent of the producers would have had a negative net cash farm income.



TABLE 5. RECEIPT OF DROUGHT ASSISTANCE BY RESPONDENTS

Item	Value	Item	Value
Did respondent receive drought assistance?		Amount received from Emergency Feed Program:	
Yes	91.5%	Mean	\$827
Amount received for crop disaster payments:		Median	\$0
Mean	\$14,918	Distribution:	
Median	\$11,000	Zero	85.8%
Distribution:		\$1 to \$5,000	8.1%
Zero	2.0%	\$5,001 to \$10,000	4.5%
\$1 to \$1,000	4.1%	\$10,001 or more	1.6%
\$1,001 to \$5,000	20.7%	Amount received from Emergency Feed Assistance Program:	
\$5,001 to \$10,000	22.7%	Mean	\$211
\$10,001 to \$20,000	27.8%	Median	\$0
\$20,001 to \$30,000	12.2%	Distribution:	
\$30,001 to \$50,000	8.5%	Zero	94.5%
\$50,001 or more	2.0%	\$1 to \$5,000	4.2%
		\$5,001 to \$10,000	1.3%
		\$10,001 or more	0.0%

TABLE 6. EFFECT OF DISASTER PAYMENTS ON NET CASH FARM INCOME

Item	Value	Item	Value
Total disaster payments:		Net cash farm income minus total disaster payments:	
Mean	\$15,234	Mean	\$6,266
Median	\$11,000	Median	\$4,000
Distribution:		Distribution:	
\$0 - \$4,999	23.7%	Less than -\$10,000	19.6%
\$5,000 - \$9,999	21.7%	-\$10,000 to -\$1	20.3%
\$10,000 - \$19,999	26.5%	\$0 - \$4,999	13.0%
\$20,000 - \$39,999	20.9%	\$5,000 - \$9,999	14.3%
More than \$39,999	7.2%	\$10,000 - \$19,999	14.3%
		More than \$19,999	18.5%

All-risk crop insurance also helped compensate for the drought losses of some producers. About 61 percent of the respondents had been covered by all-risk crop insurance in 1988 (Table 7). These producers received an average of \$12,332 in loss payments. About 89 percent of the respondents planned to buy all-risk crop insurance in 1989. Purchasing all-risk crop insurance in 1989 was a requirement in order to receive crop disaster payments for the 1988 crop. About 20 percent said their lender required them to buy crop or hail insurance.

Producers generally believed that crop insurance and drought assistance payments combined covered about half of their losses, but responses ranged widely. Most producers felt their farming operation would survive--only 2.4 percent planned to quit farming because of the drought.

TABLE 7. RESPONDENTS' PARTICIPATION IN ALL-RISK CROP INSURANCE

Item	Value	Item	Value
Did respondent have all-risk crop insurance in 1988?		Does lender require all-risk crop insurance or hail insurance?	
Yes	61.4%	Yes	19.8%
Amount received for loss payments:		What percentage of losses were compensated by crop insurance and drought assistance payments?	
Mean	\$12,332	Mean	47.4%
Median	\$7,500	Median	50.0%
Distribution:		Distribution:	
Zero	3.0%	0% - 10%	13.9%
\$1 to \$1,000	6.1%	11% - 25%	16.8%
\$1,001 to \$5,000	27.0%	26% - 50%	29.6%
\$5,001 to \$10,000	25.9%	51% - 75%	22.7%
\$10,001 to \$25,000	27.7%	76% - 100%	17.0%
\$25,001 or more	10.3%		
Does respondent plan to buy all-risk crop insurance this year?		Does respondent plan to quit farming as a result of drought?	
Yes	88.8%	Yes	2.4%

### Farm Financial Situation

About 49 percent of survey respondents felt their net cash farm income in 1988 was less than for a typical year, 38 percent believed it was about the same, and 13 percent thought 1988 income was more than normal (Table 8). For those who felt their income was greater than normal, the average improvement was 22 percent. Those who felt their income was less reported a decrease of 33 percent.

TABLE 8. COMPARISON OF 1988 NET FARM INCOME TO A TYPICAL YEAR

Question	Value
How did 1988 net cash farm income compare to a typical year?	
More	12.9%
Less	49.3%
About the same	37.8%
How much more?	
Mean	21.8%
Median	20.0%
How much less?	
Mean	-32.5%
Median	-25.0%

Producers responding to the 1989 survey reported gross farm income levels for 1988 that were slightly less than those for 1987 (Table 9). Depreciation and interest expenses were slightly lower in 1988 than in 1987, and government farm program payments (not including drought aid payments) fell about 23 percent from their 1987 level. The decline in government program payments was largely because of drought-induced increases in commodity prices, which in turn led to reductions in deficiency payments. (See Appendix Table 1 for 1988 gross income by region.)

TABLE 9 . SELECTED INCOME AND EXPENSE ITEMS FOR NORTH DAKOTA FARM AND RANCH OPERATORS

Item	Unit	1985	1987	1988
<b>Gross farm income:</b>				
Mean	Dollars	113,188	117,354	115,559
Median	Dollars	80,000	80,321	80,958
<b>Distribution:</b>				
Less than \$40,000	Percent	19.6	17.6	18.5
\$40,000 - \$99,999	Percent	41.1	43.0	40.3
\$100,000 - \$249,999	Percent	32.1	29.1	32.1
\$250,000 - \$499,999	Percent	5.0	7.9	7.1
\$500,000 or more	Percent	2.3	2.5	2.1
<b>Depreciation expense:</b>				
Mean	Dollars	15,902	18,529	16,660
Median	Dollars	11,884	12,000	10,135
<b>Distribution:</b>				
Less than \$5,000	Percent	19.2	22.6	27.4
\$5,000 to \$9,999	Percent	23.4	20.0	18.1
\$10,000 to \$19,999	Percent	25.0	27.0	26.5
\$20,000 to \$29,999	Percent	17.2	12.9	11.4
\$30,000 or more	Percent	15.2	17.5	16.6
<b>Interest expense:</b>				
Mean	Dollars	14,941	12,523	11,676
Median	Dollars	10,000	7,000	7,700
<b>Distribution:</b>				
None	Percent	9.4	11.8	12.2
\$1 to \$4,999	Percent	23.6	29.6	28.1
\$5,000 to \$9,999	Percent	16.7	16.3	17.1
\$10,000 to \$19,999	Percent	24.7	21.9	23.7
\$20,000 or more	Percent	25.6	20.4	19.0
<b>Government farm program payments:</b>				
Mean	Dollars	NA	22,799	17,568
Median	Dollars	NA	16,000	12,000
<b>Distribution:</b>				
Less than \$5,000	Percent	NA	13.6	21.8
\$5,000 to \$9,999	Percent	NA	15.2	19.2
\$10,000 to \$19,999	Percent	NA	26.8	29.9
\$20,000 to \$29,999	Percent	NA	20.2	14.7
\$30,000 or more	Percent	NA	24.3	14.5
<b>Net cash farm income:</b>				
Mean	Dollars	18,012	21,328	21,305
Median	Dollars	10,000	15,000	15,000
<b>Distribution:</b>				
Zero or negative	Percent	24.8	10.6	11.2
\$1 to \$4,999	Percent	11.1	10.6	11.2
\$5,000 to \$9,999	Percent	14.9	15.5	15.4
\$10,000 to \$24,999	Percent	28.3	36.2	33.6
\$25,000 or more	Percent	21.0	27.2	30.5

NA = not available.

Net cash farm income was almost the same in 1988 as in 1987 (about \$21,300), although there were some regional differences particularly in the west (Figure 2). Initially, this data might appear to conflict with the findings (reported earlier) that disaster payments and crop insurance made up for only about half of drought losses and that 49 percent of producers felt their income was less than in a typical year whereas only 13 percent felt it was greater (Table 8). Further reflection suggests several factors that could have supported net cash farm income in 1988. Most of these factors relate to the fact that net cash farm income does not necessarily reveal inventory changes because losses could be offset by gains. Thus, reductions in grain or feed inventories or livestock herds as a result of direct or indirect effects of the drought would not necessarily be reflected in the computation of net cash farm income for 1988. Another factor could be the difference of perception versus reality; because 1988 was a year of severe crop losses, farmers could have perceived their net cash farm income would be less than it actually was. (See Appendix Table 1 for 1988 net cash farm income by region.)

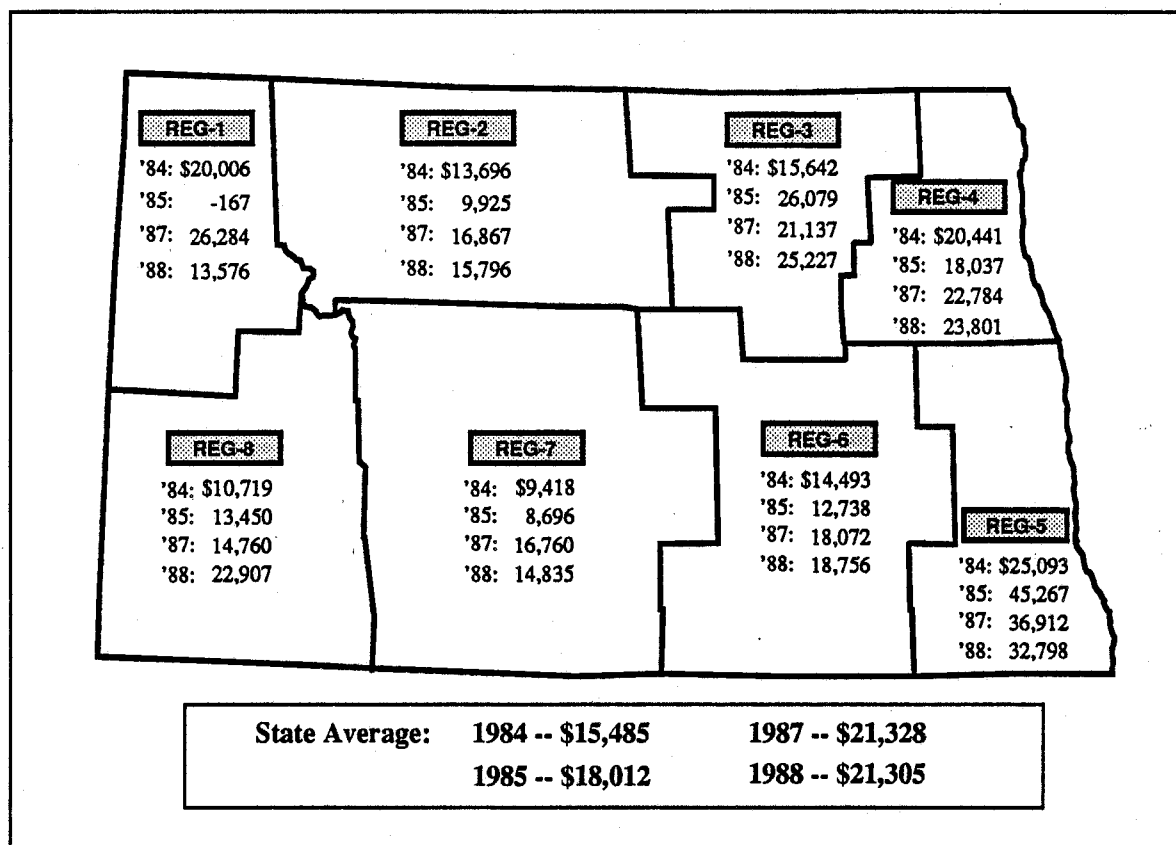


Figure 2. Average Net Cash Farm Income of North Dakota Farm and Ranch Operators by Region, 1984, 1985, 1987, and 1988

Respondents' return on assets was reduced only slightly from 1987 to 1988 (Table 10). This measure was computed by adding interest paid to net cash farm income and subtracting an allowance for operator and family labor and management (the poverty income level was used as the labor and management allowance) and dividing the result by total assets. The return on equity is computed by subtracting the allowance for labor and management from net cash farm income and dividing by owner equity (net worth). Both mean and median values for return to equity were higher in 1988 than in 1987, possibly reflecting reductions in interest paid.

TABLE 10. RETURN ON ASSETS AND EQUITY FOR  
NORTH DAKOTA FARM AND RANCH OPERATORS

Item	1985	1987	1988
Return on assets:			
Mean	5.6	6.4	5.9
Median	3.9	5.1	4.7
Distribution:			
Negative	24.5%	16.0%	18.6%
0.01 to 4.0	25.9%	25.9%	24.8%
4.01 to 9.99	31.1%	35.2%	34.8%
10.00 or more	18.6%	22.9%	21.8%
Return on equity*			
Mean	0.6	-3.6	0.4
Median	0.5	2.6	2.9
Distribution:			
Negative	47.4%	35.3%	33.6%
0.01 to 4.0	19.3%	23.7%	25.1%
4.01 to 9.99	19.0%	21.1%	21.2%
10.00 or more	14.3%	20.0%	20.2%

\*Excludes operators who reported negative equity.

The items reported in Table 11 reflect different measures of the ability of farm households to meet various demands for cash outlays. The first measure reflects the adequacy of producers' total family income (i.e., net cash farm income plus income from all nonfarm sources) to meet family living expenses (the poverty income level was used as a proxy for minimal living expenses) and principal payments. (Principal payments were estimated as the sum of 20 percent of the value of intermediate-term loans and 5 percent of the value of long-term loans.) Although the average and median values for this measure were greater in 1988 than the corresponding values for 1987 and 1985, about 42 percent of all respondents would be unable to cover all of these obligations in the long run.

The second measure reflects the adequacy of farm family income from all sources to cover farm and family living expenses. Results for 1988 are similar to those for 1987, and about 23 percent of the respondents did not have incomes sufficient to cover current farm cash expenses, capital replacement (depreciation), and family living expenses in 1988.

TABLE 11. MEASUREMENTS OF NORTH DAKOTA FARM AND RANCH OPERATORS' ABILITY TO MEET SHORT- AND LONG-RUN CASH OBLIGATIONS

Item	Unit	1985	1987	1988
Total family income less estimated family living expenses and principal payments:				
Mean	Dollars	4,299	6,336	7,909
Median	Dollars	-1,180	1,993	3,475
Distribution:				
Negative	Percent	52.8	45.6	42.1
0 to \$4,999	Percent	9.0	10.5	10.8
\$5,000 to \$19,999	Percent	16.7	22.6	24.3
\$20,000 or more	Percent	21.4	21.4	22.9
Total family income less estimated family living expenses:				
Mean	Dollars	16,623	18,490	18,461
Median	Dollars	5,358	10,775	12,085
Distribution:				
Negative	Percent	36.0	23.5	22.9
\$0 to \$4,999	Percent	12.4	14.0	10.6
\$5,000 to \$19,999	Percent	22.8	29.2	32.8
\$20,000 or more	Percent	28.8	33.3	33.7
Total family income plus depreciation less estimated family living expenses:				
Mean	Dollars	32,676	37,779	37,390
Median	Dollars	18,498	23,041	24,972
Distribution:				
Less than 0	Percent	12.8	8.2	9.1
0 to \$4,999	Percent	8.9	6.8	7.3
\$5,000 to \$9,999	Percent	10.1	9.0	6.4
\$10,000 to \$14,999	Percent	11.0	10.9	8.5
\$15,000 to \$19,999	Percent	9.4	9.5	9.7
\$20,000 to \$24,999	Percent	8.2	8.5	9.1
\$25,000 to \$29,999	Percent	5.5	6.8	7.9
\$30,000 and over	Percent	34.3	40.3	42.1

The final measure adds depreciation expense to total family income and subtracts family living expenses. This is a short-run measure of cash flow adequacy that assumes depreciation expenses as well as principal payments can be deferred in the short-term. Information summarized in Table 11 indicates that in both 1987 and 1988 less than one-tenth of the respondents would be unable to meet these short-run cash outlay demands. It should be pointed out, however, that the analysis presented here offers a very conservative view of cash flow needs because (1) federal and state income tax liabilities are ignored and (2) the poverty income threshold is used as the estimate of family living expenses. (For further discussion of these measures and the logic underlying them, see Leistriz et al. 1989 and Leistriz et al. 1987.)

The level and composition of total family income for the respondents changed only slightly from 1987 to 1988 (Table 12). Earnings from off-farm employment and other off-farm income (e.g., from investments) were up slightly, while farm income and revenues from mineral leases showed slight decreases.

TABLE 12. COMPOSITION OF FARM FAMILY INCOME, NORTH DAKOTA, 1984, 1985, 1987, AND 1988

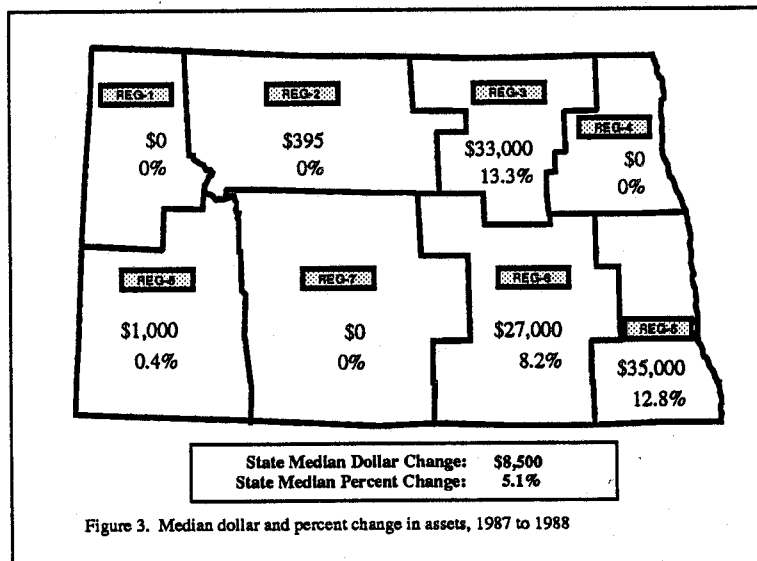
Item	1984	1985	1987	1988
	-----percent of total-----			
Net cash farm income	60.8	64.8	71.1	70.3
Earnings from off-farm employment	18.9	20.5	20.0	20.0
Mineral lease income	9.7	3.5	1.4	1.2
Other off-farm income	10.6	11.2	7.5	8.5
Total farm family income	\$24,489	\$26,545	\$28,833	\$29,024

Asset values in 1988 were up slightly (about 1 percent) from their 1987 level, the first increase in asset value since the panel study began (Table 13). The increase results in large measure from the slight increase in land values that occurred in 1988 (Johnson 1989). Regional differences, however, existed (Figure 3).

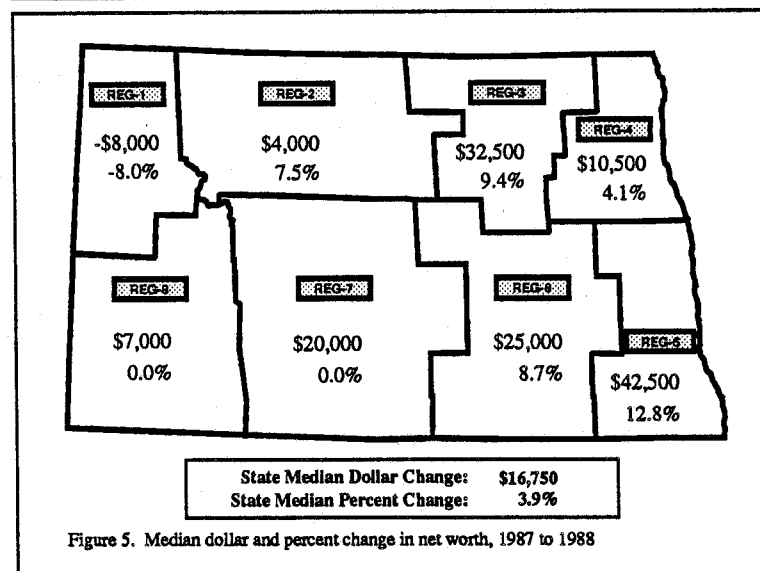
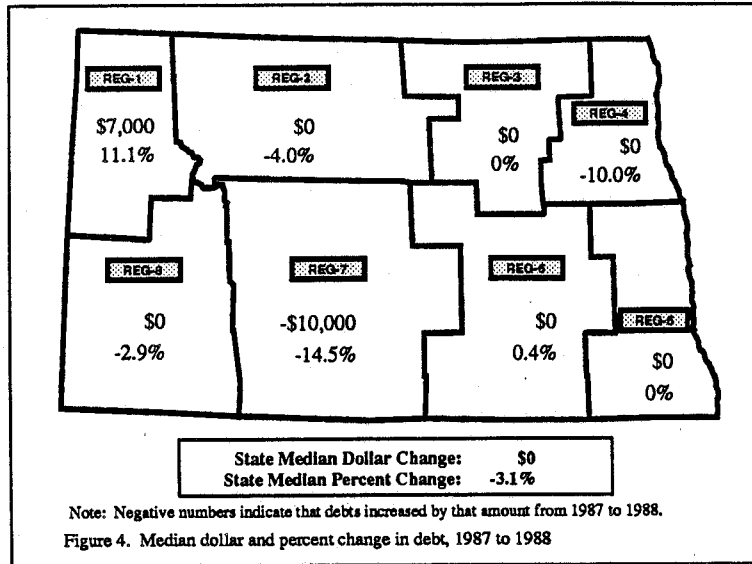
Producers also succeeded in reducing their outstanding debt by about 3.8 percent in 1988, the second straight year that substantial reductions had been achieved. With asset values growing and debt decreasing, the average net worth of producers increased for the first time since the early 1980s. See Figures 4 and 5 for regional differences.

TABLE 13. TOTAL ASSETS, DEBT, NET WORTH, AND DEBT-TO-ASSET RATIO OF NORTH DAKOTA FARMERS, DECEMBER 31, 1984, 1985, 1987, AND 1988

Item	Average	Median	Item	Average	Median
-----dollars-----			-----dollars-----		
<b>Total assets:</b>			<b>Net worth:</b>		
1984	419,677	300,000	1984	279,562	200,000
1985	396,233	280,000	1985	252,593	160,000
1987	387,377	257,000	1987	252,509	160,000
1988	391,025	283,000	1988	263,182	177,000
<b>Total debt:</b>			<b>Debt-to-asset ratio:</b>		
-----dollars-----			-----number-----		
1984	141,830	82,000	1984	.36	.30
1985	140,484	89,000	1985	.41	.30
1987	132,281	80,000	1987	.45	.32
1988	127,284	80,000	1988	.49	.31







The debt-to-asset ratio has often been used as a key indicator of financial health. The average debt-to-asset ratio continued to rise in 1988 although the median value fell slightly (Table 13). It appears, however, that a few producers with very high debt levels, including some who are insolvent, may influence the mean value substantially. The debt-to-asset level varied widely by region from a low of 32.2 in the northeast to a high of 74.1 in north central (Figure 6 and Appendix Table 1). The distribution of producers by debt-to-asset ratio may be more indicative of changes in producers' status (Table 14). By the end of 1988, fewer producers were in the very highly leveraged category with debt-to-asset ratios of 0.7 or higher. Only 15 percent of North Dakota producers fell into this category at the end of 1988 compared to 19.9 percent a year earlier. Thus, rising asset values coupled with stable incomes in 1988 appear to have reduced the number of producers whose financial positions were most precarious. The aging of the panel of farmers could also help explain the improved debt situation; younger farmers with higher debt were not being added to the panel.

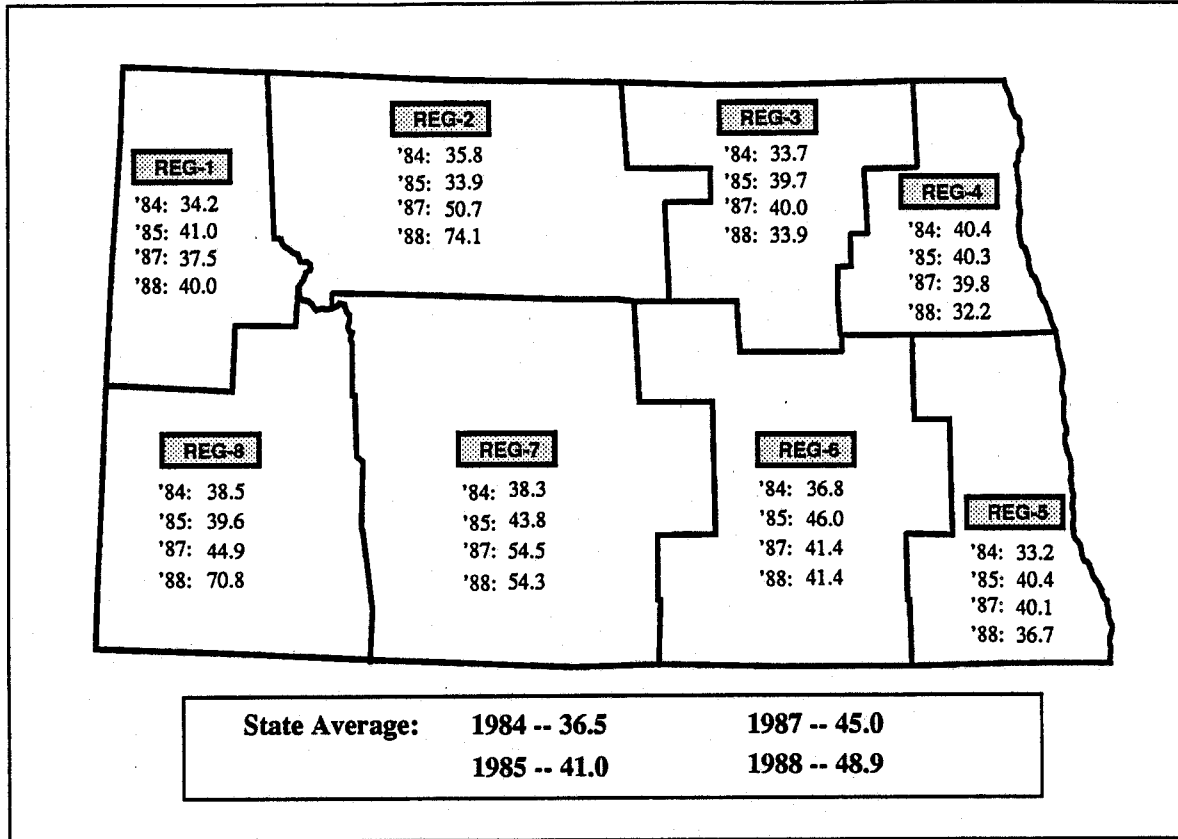


Figure 6. Debt-to-Asset Ratios for North Dakota Farm and Ranch Operators, 1984, 1985, 1987, and 1988

TABLE 14. DEBT-TO-ASSET RATIOS OF NORTH DAKOTA FARM OPERATORS, DECEMBER 31, 1984, 1985, 1987, AND 1988

Item	1984	1985	1987	1988
	-----percent-----			
No debt	14.5	14.7	14.2	16.1
0.01 to 0.40	47.2	45.0	43.9	45.2
0.41 to 0.70	22.6	24.3	22.0	23.6
0.71 to 1.00	13.2	10.7	13.5	9.3
More than 1.00	2.6	5.4	6.4	5.7

### Outlook and Information Sources

Despite the drought, producers surveyed had not changed their general outlook substantially from the previous year (Figure 7 and Appendix Table 2). About 27 percent felt they were likely to expand their operation over the next three years, and about 84 percent were confident they could continue to farm for at least three years. While only about 30 percent were satisfied with current financial returns in farming, almost 84 percent expressed satisfaction with farming as an occupation, and almost two-thirds were satisfied with farming overall.

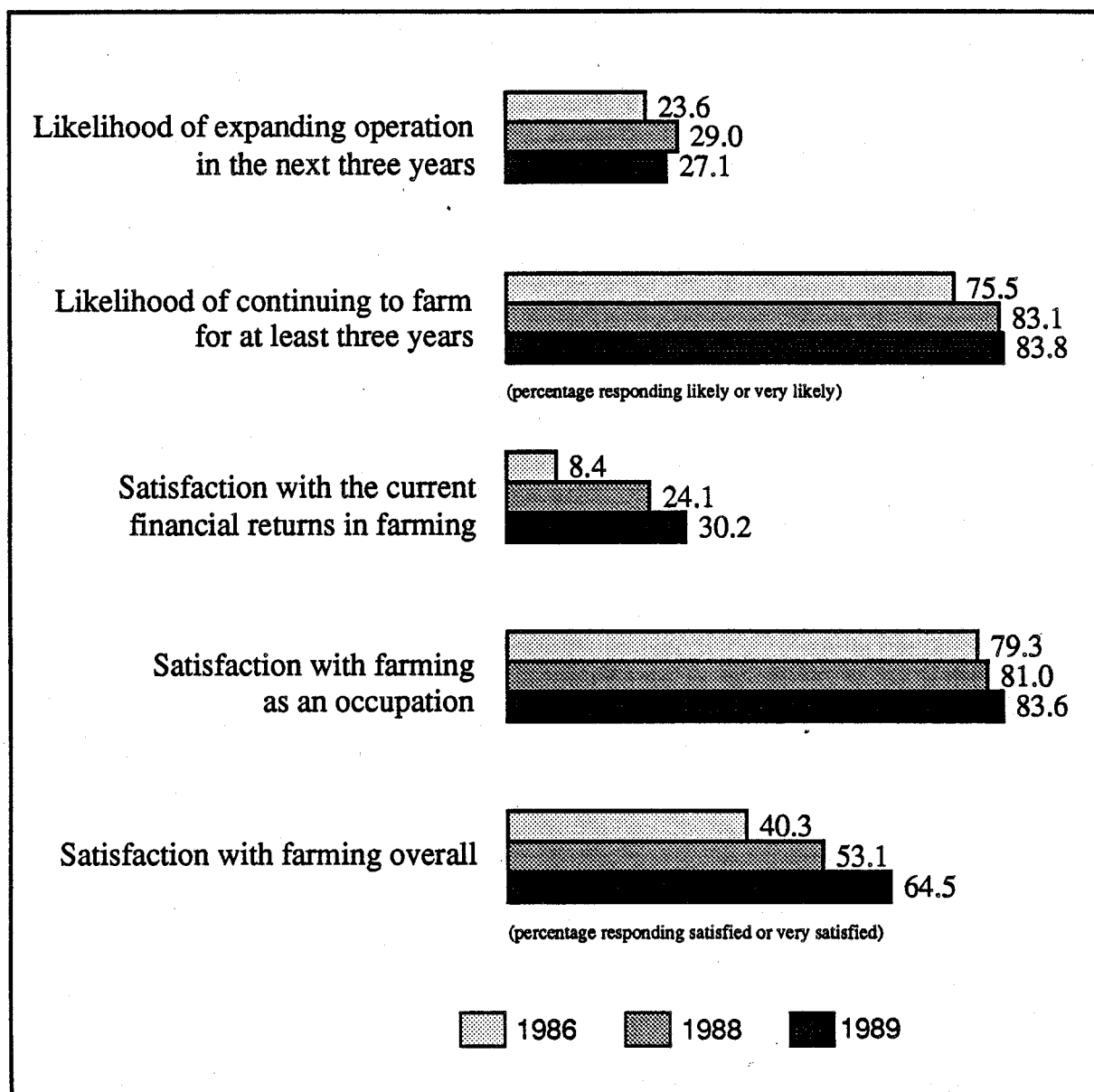


Figure 7. Outlook and Satisfaction with Farming, 1986, 1988, and 1989

Survey respondents have made extensive use of NDSU Extension over the past few years (Table 15). Almost 44 percent of the producers had requested information from Extension in the past three years, and more than 37 percent had attended Field Days. When asked if they would like to receive more information from Extension, 39 percent said they would. Topics ranged from learning about grain varieties to conservation. Booklets and circulars were the form of information most desired.

TABLE 15. RESPONDENTS' USE OF EXTENSION SERVICE INFORMATION

Item	Value	Item	Value
	(percent)		(percent)
Has respondent requested information from Extension Service in last three years?		Respondent desires more information from the Extension Service	39.0
Yes	43.6	Topics:	
Has respondent attended any of the following events in last three years?		Grain varieties	20.0
Field Days	37.2	Beef and dairy cattle	15.0
Extension Short Courses	16.7	Chemical/fertilizer use	11.1
Wheat School	13.8	Other livestock	7.8
Maximum Economic Yield Program	11.9	Conservation of land and water	7.4
Beef School	8.8	Marketing	7.2
Sheep School	2.2	Insect/weed control	6.1
		Crop management	5.0
		Preferred form for information:	
		Booklets	71.3
		Short courses	34.0
		Other	5.3

### Conclusions and Implications

Despite drought conditions of historic proportions, most North Dakota farmers and ranchers experienced improved financial conditions in 1988. Both gross farm income and net cash farm income were down only slightly from the levels recorded in 1987, one of the better years in the decade. Producers managed to reduce their total debt by about 4 percent, on average. This, together with a slight increase in asset values, resulted in a 4 percent gain in net worth for the average operator, the first increase since the farm panel study was initiated. The percentage of operators with debt-to-asset ratios exceeding 0.7 (a level considered extremely vulnerable to financial problems) declined substantially, suggesting fewer problems for both producers and their lenders.

The Disaster Assistance Act of 1988 was pivotal in enabling many North Dakota producers to avoid severe financial losses. More than 91 percent of all respondents received drought aid, with total payments averaging more than \$15,000. Crop disaster payments were the major form of aid received, but many livestock producers also received help through the Emergency Feed programs. Crop insurance also was important to many farmers. About 61 percent of the survey participants had been covered by all-risk crop insurance, and they received loss payments averaging more than \$12,000.

Although average gross farm income and net cash farm income for 1988 remained near their 1987 levels, the drought will have long-term implications for many producers. Drought conditions led many producers to reduce their livestock herds and feed inventories, while others sold stored grain in response to rising prices. Estimating the magnitude of these inventory changes was beyond the scope of this study, but their effects will be felt in 1989 and perhaps beyond. Favorable weather and crop conditions will be needed to ensure further recovery of North Dakota agriculture.

## APPENDIX



APPENDIX TABLE 1. GROSS FARM INCOME, NET CASH FARM INCOME, AND DEBT-TO-ASSET RATIO OF NORTH DAKOTA FARM OPERATORS BY REGION

Item	Unit	Region								Total
		1	2	3	4	5	6	7	8	
Gross farm income:										
Mean	Dollars	115,643	82,562	125,748	128,359	156,600	117,154	89,674	117,631	115,559
Median	Dollars	55,000	60,000	84,680	117,500	123,749	85,000	79,160	80,479	80,958
Distribution:										
\$0 to \$40,000	Percent	29.4	26.4	20.0	23.7	16.4	17.9	18.6	18.0	20.0
\$40,001 to \$100,000	Percent	52.9	56.6	40.0	21.1	26.9	42.3	54.7	46.0	42.8
\$100,001 to \$250,000	Percent	11.8	13.2	30.0	42.1	38.8	30.8	23.3	30.0	28.5
\$250,001 or more	Percent	5.9	3.8	10.0	13.2	17.9	9.0	3.5	6.0	8.7
Net cash farm income:										
Mean	Dollars	13,576	15,796	25,227	23,801	32,798	18,756	14,835	22,907	21,305
Median	Dollars	10,173	12,000	15,000	20,964	27,500	14,500	13,000	17,000	15,000
Distribution:										
Zero or negative	Percent	23.5	7.7	10.2	7.9	8.9	13.1	15.9	6.5	11.2
\$1 to \$10,000	Percent	23.6	38.5	26.5	21.0	17.6	26.3	30.5	26.0	26.6
\$10,001 to \$25,000	Percent	35.3	44.2	32.7	34.2	22.1	31.6	31.7	45.7	33.6
\$25,001 or more	Percent	17.6	9.6	30.6	36.8	51.4	29.0	22.0	21.8	28.5
Debt-to-asset ratio:										
Mean	Percent	40.0	74.1	33.9	32.2	36.7	41.4	54.3	70.8	48.9
Median	Percent	36.7	31.0	23.5	22.0	30.0	33.3	34.6	34.2	30.7
Distribution:										
No debt	Percent	5.6	10.5	24.0	17.9	16.9	17.1	15.7	15.2	16.1
0.01 to 0.40	Percent	50.0	52.6	44.0	51.3	46.2	40.8	43.8	39.1	45.2
0.41 to 0.70	Percent	33.3	24.6	20.0	23.1	23.1	25.0	23.6	21.7	23.6
0.71 or more	Percent	11.1	12.3	12.0	7.7	13.8	17.1	16.9	23.9	15.0



APPENDIX TABLE 2. FARM OPERATOR'S OUTLOOK  
CONCERNING FUTURE OF THEIR FARMING  
OPERATION AND SATISFACTION WITH FARMING

Item	1986	1988	1989
	-----percent-----		
Respondent will expand operation in next three years:			
Very likely	8.2	10.5	10.6
Likely	15.4	18.5	16.5
Don't know	17.4	16.8	18.9
Unlikely	27.5	26.2	29.9
Very unlikely	31.5	28.0	24.1
Respondent will be able to continue to farm for at least three years:			
Very likely	31.7	42.1	40.7
Likely	43.8	41.0	43.1
Don't know	19.5	12.1	11.3
Unlikely	3.5	2.6	1.5
Very unlikely	1.5	2.2	3.3
Respondent's satisfaction with current financial returns in farming:			
Completely satisfied	0.7	1.5	1.3
Satisfied	7.7	22.6	28.9
Neither satisfied nor dissatisfied	7.7	16.1	17.8
Dissatisfied	46.7	43.7	43.4
Very dissatisfied	37.3	16.1	8.7
Respondent's satisfaction with farming as an occupation:			
Completely satisfied	23.9	29.0	27.6
Satisfied	55.4	52.0	56.0
Neither satisfied nor dissatisfied	9.6	9.7	7.6
Dissatisfied	8.5	7.5	7.4
Very dissatisfied	2.6	1.7	1.5
Respondent's satisfaction with farming overall:			
Completely satisfied	1.1	7.1	5.4
Satisfied	39.2	46.0	59.1
Neither satisfied nor dissatisfied	23.0	22.7	18.2
Dissatisfied	30.9	19.9	14.3
Very dissatisfied	5.9	4.3	3.0

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