

FARM MANAGEMENT

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Newsletter

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1985 MISSOURI IRRIGATION SURVEY REPORT

This newsletter reports the results of a survey of irrigating farmers in Missouri in 1985. The survey was conducted in cooperation with Extension Specialists and farmers throughout Missouri.

Summary

According to irrigators who provided survey information, 1985 was a record year for average irrigated yields for corn and soybeans. Reported average yields per acre were higher while costs per acre were less than the year before. With adequate rainfall during most of the growing season, non-irrigators also had a much better year than in 1984.

Major problems reported by Missouri irrigators in 1985 were:

1. Too much rainfall in June resulting in stunting, poor stands, and in some cases replanting. Several irrigators reported problems with loss or "tie-up" of N on corn. Some reported excellent results when N was applied at the first irrigation.
2. Delay of irrigation - particularly during July.
3. Late harvesting problems on corn - some fields not harvested until December.

Results

The analyses and comparisons in this report were based on a total of 64 survey replies

with sufficient data. No survey data were received from the Bootheel Counties.

General Irrigation Information. Types of systems, water supplies, and pumping power were reported by irrigators in 1985. The predominant system continues to be the center pivot reported by 66 percent of the respondents. The traveling gun system was used by 30 percent of the irrigators surveyed. Sixty-two percent of the irrigators used reservoirs for their water supply. Diesel fuel and electricity, 56 percent and 28 percent, respectively, provided the pumping power for irrigators in the 1985 survey.

Irrigation Results. Irrigation results by crops are presented in Tables 1 and 2 for 1985. Crops summarized were corn, single-crop soybeans, double-crop soybeans, milo, and alfalfa. Other crops were reported; however, acreage was not sufficient for tabulation. Table 1 shows the irrigation rates, amount of water applied, and yield results. Irrigators in 1985 averaged only 2.8 applications per acre on corn compared to 5.7 applications the previous year. The average total inches applied per acre were 3.1 inches for corn and 2.1 inches for soybeans. These amounts were less than one-half of the water applied in 1984. Irrigated corn averaged 152.8 bushels; irrigated single-crop soybeans averaged 50.3 bushels; and double-crop soybeans averaged 31.7 bushels per acre. These irrigated yields were significantly higher

than the year before. Due to adequate rainfall during most of the growing season in 1985, dryland crop yields were also significantly higher than the previous year. The reported yields for irrigated corn still averaged 37.4 bushels more per acre than dryland corn. Irrigated single-crop soybeans averaged only 4.4 bushels more than dryland soybeans in 1985. In contrast, irrigated double-crop soybeans topped the dryland soybeans by almost 23 bushels per acre in 1984. The average irrigated corn and soybean yields per acre in 1985 were record highs for the survey during the past 10 years.

Fuel, Repair, and Maintenance Costs.

Table 2 summarizes the average fuel and repair costs reported in 1985. The average irrigation fuel cost per acre-inch application was less than the previous year. With reduced water applications, repair costs per acre were significantly less than in 1984. The average fuel cost was \$3.37 per acre-inch last year. Irrigation repairs and maintenance costs per acre were \$2.92 in 1985 compared to approximately \$5.00 per acre in 1984.

Economic Results. The economic results are shown in the estimated crop budgets for Tables 3 and 4. Only corn and single crop soybeans are reported in these tables for 1985. Budget assumptions are made concerning specific expenses and prices. Prices per bushel are December 1 cash prices in Central Missouri. Table 3 shows the return to land and management per acre based on the average irrigated yields reported.

Table 1. 1985 Missouri Irrigation Results

	Corn	Soy- beans	D.C. Soybeans	Milo	Alfalfa
No. reporting	56	25	10	3	3
Avg. ac.					
irrigated	123	89	50	200	78
In./application	1.1	.99	.89	1.4	2.1
Times irrigated	2.8	2.1	2.7	1.7	2.7
Total inches/ac.	3.1	2.1	2.4	2.3	5.6
Irrigated					
yield/ac.	152.8	50.3	31.7	127.0	7.4 T.
Dryland yield/ac.	115.4	45.9	24.5	112.7	7.0
Difference	37.4	4.4	7.2	14.3	.4 T.

For example, the gross income per acre for irrigated corn is \$360.60. This gross is based on the cash price of \$2.36 per bushel at harvest. However, many irrigators received deficiency payments and some probably "locked in" higher market prices. Operating costs per acre were estimated at \$182.90. These costs were 6 percent below the operating costs per acre in 1984. Lower irrigation fuel, repair, and interest costs accounted for this reduction. Ownership costs of \$125 per acre were also charged. These costs included annual depreciation and interest on crop machinery and irrigation equipment plus a charge for labor. Total nonland costs were \$307.90 per irrigated corn acre. Subtracting the nonland costs from the gross income per acre resulted in a \$52.70 return per acre to land, management, and risk. Irrigated single crop soybeans returned \$24.30 per acre in 1985.

Table 4 shows the differences in costs and returns over non-irrigated corn and soybeans. For example, irrigated corn averaged 37.4 bushels per acre more than non-irrigated corn. With a lower cash price of \$2.36 per bushel, only \$88.30 per acre added income was generated. With the estimated added nonland costs of \$93.00 per acre, irrigated corn showed a negative \$4.70 added return to land and management over non-irrigated corn in 1985.

With only 4.4 added bushels per acre, irrigated single crop soybeans showed a negative \$51.50 added return to land and management over non-irrigated soybeans in 1985.

Table 2. Average Fuel and Repair Costs Reported in 1985*

	Cost per ac.-in.	Repair cost per ac.
Diesel	\$3.29	--
Propane	3.89	--
Electricity	3.32	--
Natural gas	2.69	--
Average all	\$3.37	\$2.92

*64 farms reporting.

Table 3. Estimated Costs and Returns Per Acre for Irrigated Crops in Missouri, 1985

	Corn	Single crop Soybeans
Yield/acre (bu.)	152.8	50.3
Price/bu. (12/1/85)	\$ 2.36	\$ 4.71
Gross income	\$360.60	\$236.90
<u>Operating Costs:</u>		
Seed	\$ 18.00	\$ 10.00
Fertilizer and lime	60.50	18.50
Chemicals	20.00	16.00
Machinery fuel, etc.	30.00	28.00
Hauling and drying @ 20¢/bu.	30.50	5.00*
Irrigation fuel (\$3.37/ac.-inch)	10.50	7.00
Irrigation repairs	2.90	2.90
Interest @ 12% for 6 mos.	10.50	5.20
	<u>\$182.90</u>	<u>\$ 92.60</u>
<u>Ownership Costs:</u>		
Machinery	\$ 35.00	\$ 35.00
Irrigation equipment	60.00	60.00
Labor	30.00	25.00
	<u>\$125.00</u>	<u>\$120.00</u>
Total nonland costs	\$307.90	\$212.60
Return to land and management	\$ 52.70	\$ 24.30

*10¢/bu. for hauling beans.

Table 4. Estimated Added Costs and Returns for Irrigated Crops in Missouri, 1985

	Corn	Single crop Soybeans
Added yield/acre (bu.)	37.4	4.4
Price/bu.	\$ 2.36	\$ 4.71
Added gross income	\$ 88.30	\$ 20.70
<u>Added Operating Costs:</u>		
Seed	\$ 3.00	--
Fertilizer	13.00	\$ 3.50
Hauling and drying @ 20¢/bu.	7.50	.40*
Irrigation repairs	2.90	2.90
Interest @ 12%	1.60	.40
	<u>\$ 28.00</u>	<u>\$ 7.20</u>
<u>Added Ownership Costs:</u>		
Irrigation equipment	\$ 60.00	\$ 60.00
Labor	5.00	5.00
	<u>\$ 65.00</u>	<u>\$ 65.00</u>
Total added nonland costs	\$ 93.00	\$ 72.20
Added return to land and management	-\$ 4.70	-\$ 51.50

*10¢/bu. for hauling beans.

Long-run Irrigation Results. Ten-year irrigated and dryland yields are summarized in Table 5. The average irrigated yield reported is 128 bushels per acre over the 10-year period. This is an average of 45 bushels added yield per acre over dryland corn. Over the same period, irrigated first-crop soybeans have averaged 13 bushels per acre more than non-irrigated soybeans. Irrigated milo yields have averaged 30 bushels per acre more than non-irrigated milo during the 10-year period.

Are these average irrigated crop yields high enough to assure profitable returns? The key consideration in answering this question is the marketing opportunity afforded by irrigators. Irrigators should have less risk in contracting their crops early enough to take advantage of higher prices. With a larger dependence on government programs for feed grains, irrigators have opportunity to increase their ASCS base yields and consequently their deficiency payments.

Table 5. Ten-year Irrigated and Dryland Yields (Bu./Acre)
(as reported by Missouri irrigators surveyed)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Avg.
CORN:											
Irrigated	113	130	121	149	84	146	138	103	143	153	128
Dryland	53	95	86	92	34	127	116	38	72	115	83
Difference	60	35	35	57	50	19	22	65	71	38	45
SOYBEANS:											
First crop:											
Irrigated	36	50	42	47	37	43	45	35	41	50	43
Dryland	23	41	32	30	22	36	39	16	18	46	30
Difference	13	9	10	17	15	7	6	19	23	4	13
Second crop:											
Irrigated	19	37	31	21	23	25	30	23	24	32	27
Dryland	8	27	23	6	11	19	23	9	10	25	16
Difference	11	10	8	15	12	6	7	14	14	7	11
MILO:*											
Irrigated	119	117	110	128	76	114	--	95	115	127	111
Dryland	77	92	92	84	39	97	--	61	72	113	81
Difference	42	25	18	44	37	27	--	34	43	14	30

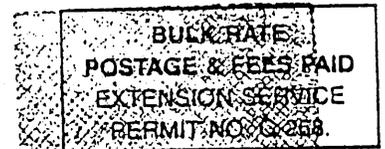
*Nine-year average omitting 1982 (too few yields to report).

Area Extension Specialists who conducted this survey were:

Van Ayers	Rodney Hexem	David Miller	Maryann Redelfs	Frank Wideman
Bruce Beck	Gary Hoette	Richard Pirog	Robert Schultheis	Tom Wojcik
Paul Brautigam	Clem Koenig	Wayne Prewitt	Dale Schnarre	Pat Yockey
Don Day	David Lindell	David Quarles	Charles Shay	

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