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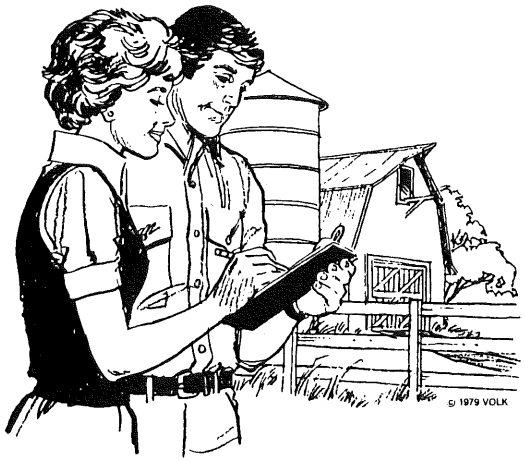

FARM MANAGEMENT Newsletter

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1984 MISSOURI IRRIGATION SURVEY REPORT

This newsletter reports the results of a survey of irrigating farmers in Missouri in 1984. The survey was conducted in cooperation with Extension Specialists and farmers throughout Missouri.

Summary

Irrigators reported a much better year in 1984 than in 1983. Reported results show above average irrigated yields for corn compared to 1983. Production costs per acre remained about the same as the previous year. With the exception of milo, Missouri irrigators also had a much better year than non-irrigators in 1984. One irrigator described 1984 as: "first too wet, then too dry, then too wet, and a September freeze thrown in for good measure." Major production problems reported by Missouri irrigators in 1984 were:

1. Heavy rains in June compacted soils and reduced stands again this year.

2. In general, poor harvesting conditions contributed to losses.

3. Some frost damage was reported on late planted soybeans.

4. Some reservoir irrigators reported a shortage of water for irrigating soybeans.

Results

The analysis and comparisons in this report were based on a total of 102 replies with sufficient data. No survey data were received from the Bootheel counties this year.

General Irrigation Information. Types of systems, water supplies, and pumping power were reported by Missouri irrigators. The predominant system used was the center pivot system reported by 65 percent of the respondents. Reservoirs and wells dominated the water supplies of the irrigators reporting. Type of fuel used by Missouri irrigators varied in the survey. However, diesel and electricity were the predominant fuels used.

Irrigation Results. Missouri irrigation results by crops are shown in Tables 1 and 2. Crops irrigated were corn, single-crop soybeans, double-crop soybeans, milo, and alfalfa. Table 1 shows the amounts of water applied per acre in 1984 by Missouri irrigators. They averaged 6.4 inches of water applied per acre for corn, 4.8 inches for single-crop soybeans, 4.5 inches for double-crop soybeans, 4.8 inches for milo, and 3.6 inches for alfalfa. Total inches of water applied per crop acre in 1984 were significantly less than the previous year. Per acre yield results are also shown in

this table. Irrigated corn averaged 142.8 bushels, single-crop soybeans averaged 41.3 bushels, double-crop soybeans averaged 23.8 bushels, grain sorghum averaged 115.5 bushels, and alfalfa averaged 5.0 tons per acre. The additional yields over non-irrigated crops were significant again this year. For example, the reported yields for irrigated corn averaged 71 bushels more per acre than dryland corn. Almost 23 bushels additional yield per acre for soybeans was achieved by irrigators over dryland soybeans in 1984.

Fuel, Repair, and Maintenance Costs. Irrigators were also asked to estimate their irrigation fuel costs per acre-inch and irrigation repair and maintenance costs per irrigated acre. The average fuel cost reported by Missouri irrigators was $3.50 per acre-inch in 1984. The average fuel costs per acre-inch for propane, diesel, electricity, and natural gas are compared in Table 2. Irrigation repair and maintenance costs averaged $4.99 per acre for Missouri irrigators in 1984.

Economic Results. The economic results are shown in the estimated crop budgets for Tables 3 and 4. Assumptions are made regarding specific costs and prices. Using December 1 cash prices in Central Missouri and yield results in Table 1, the per acre gross income for corn was $385.55. Operating costs, including interest at 13 percent, were estimated at $196.75 per acre for irrigated corn. Ownership costs of $130 per acre are also charged against the corn. The $65 charge for irrigation is an approximation of the fixed costs for depreciation and interest on the investment. For new systems, this cost could be higher or lower depending on the investment per acre in the water resource, pump unit, power unit, and irrigation equipment. We have also included a $30 charge for labor as a fixed cost cost in this analysis. Adding operating costs to ownership costs, total average nonland cost per irrigated corn acre was $326.75. Subtracting these costs from the gross income results in $58.80 per acre return to land and management. Irrigated single-crop soybeans returned $22.55 per acre to land and management while irrigated milo returned only $7.76 per acre. Return to land and management is the amount left to pay rent or interest on the land investment plus a reward for management.

Differences in returns (not profit) per acre over non-irrigated corn, soybeans, and milo are estimated in Table 4. Irrigated corn had an advantage of $63.62 per acre above the non-irrigated corn. Irrigated single-crop soybeans generated $42.20 more return to land and management than non-irrigated soybeans. Irrigated milo, on the other hand, showed negative $4.29 returns to land and management per acre compared to dryland milo in 1984.

Table 1. 1984 Missouri Irrigation Results*

	Corn	Soybeans	D.C. Soybeans	Milo	Alfalfa
No. reporting	81	69	42	10	5
Avg. ac. irrigated	131	115	68	77	74
In./application	1.12	1.12	1.15	1.26	1.71
Times irrigated	5.7	4.3	3.9	3.8	2.1
Total inches/ac.	6.4	4.8	4.5	4.8	3.6
Irrigated yield/ac.	142.8	41.3	23.8	115.5	5.0 T
Dryland yield/ac.	71.7	18.5	9.5	72.1	4.3
Difference	71.1	22.8	14.3	43.4	.7 T.

*Does not include Bootheel counties.

Table 2. Average Fuel and Repair Costs Reported in 1984*

	Cost per ac.-in.	Repair cost per ac.
Diesel	$3.53	--
Propane	3.85	--
Electricity	3.26	--
Natural gas	2.76	--
Average all	$3.50	$4.99

*61 farms reporting.

Table 3. Estimated Costs and Returns Per Acre for Irrigated Crops in Missouri, 1984

	Single crop		
	Corn	Soybeans	Milo
Yield/acre (bu.)	142.8	41.3	115.5
Price/bu. (12/1/84)	$ 2.70	$ 6.12	$ 2.43
Gross income	$385.55	$252.75	$280.66
Operating Costs:			
Seed	$ 18.00	$ 10.00	$ 5.00
Fertilizer and lime	60.50	18.50	50.40
Chemicals	20.00	16.00	14.00
Machinery fuel, etc.	36.00	32.00	32.00
Harvesting, hauling, drying @ 16¢/bu.*	22.85	3.30	18.50
Irrigation fuel ($3.50/ac.-inch)	22.40	16.80	16.80
Irrigation repairs, etc.	5.00	5.00	5.00
Interest @ 13% for 6 mos.	12.00	6.60	9.20
	$196.75	$108.20	$150.90
Ownership Costs:			
Machinery	$ 35.00	$ 32.00	$ 32.00
Irrigation equipment	65.00	65.00	65.00
Labor	30.00	25.00	25.00
	$130.00	$122.00	$122.00
Total nonland costs	$326.75	$230.20	$272.90
Return to land and management	$ 58.80	$ 22.55	$ 7.76

*8¢/bu. for harvesting and hauling beans.

Table 4. Estimated Added Costs and Returns for Irrigated Crops in Missouri, 1984

	Single crop		
	Corn	Soybeans	Milo
Added yield/acre (bu.)	71.1	22.8	43.4
Price/bu.	$ 2.70	$ 6.12	$ 2.43
Added gross income	$191.97	$139.55	$105.46
Added Operating Costs:			
Seed	$ 3.00	--	--
Fertilizer	13.00	$ 3.50	$ 10.00
Harvesting, hauling, drying @ 16¢/bu.*	11.40	1.80	6.95
Irrigation fuel	22.40	16.80	16.80
Irrigation repairs, etc.	5.00	5.00	5.00
Interest @ 13%	3.55	1.75	2.50
	$ 58.35	$ 28.85	$ 41.25
Added Ownership Costs:			
Irrigation equipment	$ 65.00	$ 65.00	$ 65.00
Labor	5.00	3.50	3.50
	$ 70.00	$ 68.50	$ 68.50
Total added nonland costs	$128.35	$ 97.35	$109.75
Added return to land and management	$ 63.62	$ 42.20	-$4.29

*8¢/bu. for harvesting and hauling beans.

Long-run Irrigation Results. Nine-year irrigated and dryland yields are summarized in Table 5. The average irrigated yield reported for corn is 125 bushels per acre. This is a significant increase over average dryland yields for the period. Is the irrigated average yield for corn high enough to assure profits? An average of 42 bushels of soybeans per acre was reported by irrigators compared to 29 bushels for dryland farmers. Irrigated milo averaged 109 bushels over the eight-year period. Are these irrigated average yields high enough to assure profits? The answer may be in the marketing opportunities afforded. Irrigators have less risk in contracting their corn crops early to take advantage of higher prices resulting from scares in the market.

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

		1976	1977	1978	1979	1980	1981	1982	1983	1984	Avg.
CORN:	Irrigated	113	130	121	149	84	146	138	103	143	125
	Dryland	53	95	86	92	34	127	116	38	72	79
	Difference	60	35	35	57	50	19	22	75	71	47
SOYBEANS:											
First crop:	Irrigated	36	50	42	47	37	43	45	35	41	42
	Dryland	23	41	32	30	22	36	39	16	18	29
	Difference	13	9	10	17	15	7	6	19	23	13
Second crop:	Irrigated	19	37	31	21	23	25	30	23	24	26
	Dryland	8	27	23	6	11	19	23	9	10	15
	Difference	11	10	8	15	12	6	7	14	14	11
MILO:*	Irrigated	119	117	110	128	76	114	--	95	115	109
	Dryland	77	92	92	84	39	97	--	61	72	77
	Difference	42	25	18	44	37	27	--	34	43	34

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

* * * * *

Area Extension Specialists who conducted this survey were:

Dale Schnarre	Calvin Jones	Robert Schultheis	Jerry Carpenter	Charles Shay
Gary Hoette	Bill Gray	Gail King	Ken Bolte	David Quarles
Bob Chapple	Scott Killpack	Paul Brautigam	Maryann Redelfs	David Miller
Dale Watson	David Lindell	Marion Gentry		

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