

## Missouri 1993 Irrigation Survey\*

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This survey marks the sixteenth year the University of Missouri has collected data from Missouri farmers on irrigation performance. The numbers presented here are the average values for 47 irrigation systems which responded to our December 1993 survey. Each irrigation system is reported separately. Therefore, this data does not represent 47 different farms. Irrigation systems located in the bootheel region of southeast Missouri are not included in this report.

Farmers who responded to this survey irrigated five different crops in 1993. However, yield data on irrigated popcorn is not included in this report as there were too few responses to comfortably draw conclusions.

Survey respondents included 11 irrigation systems which were used to irrigate corn in Missouri in 1993. On average each of these systems irrigated 109.5 acres of corn which produced an average yield of 113.4 bushels per acre. Dryland corn grown on these same farms produced an average yield of 107.9 bushels per acre. Thus, irrigation produced an average corn yield increase of 5.5 bushels per acre.

Soybean yield increases from irrigation averaged 4.8 bushels per acre on full-season beans and 7.2 bushels on double-crop soybeans.

The last two pages of this report are crop budgets which were built around this survey data using harvest-time crop prices and average Missouri production costs. They show that the increased yield for soybeans in 1993 more than paid the variable costs associated with irrigation. However, if a per acre charge is made for interest and depreciation on the irrigation equipment then no crop showed a positive net return over total irrigation costs.

As has been shown in the past by this survey, irrigation systems will not pay for themselves in wet years.

**MISSOURI 1993 IRRIGATION SURVEY**  
(excluding Bootheel)

Presented at the Irrigation Conference  
Columbia, Mo. -- February 2, 1994  
Ron Plain, Extension Economist

<b>Types of Systems</b>	<b>Percent</b>
Center pivot	89
Traveling gun	9
Other	2
<b>Types of Water Supplies</b>	
Reservoir	56.8
Well	21.6
Stream	5.4
Combination, reservoir/well/stream	8.1
Lagoon	8.1
<b>Types of Pumping Power</b>	
Diesel	58.3
Electricity	33.3
Diesel/electric combination	8.3
Propane	0
Natural gas	0
<b>Water Supply Adequate?</b>	100% yes
<b>Reservoir Full in June?</b>	100% yes
<b>Applied:</b>	Fertilizer through system -- 3
	Insecticides through system -- 0
	Herbicides through system -- 0

**1993 IRRIGATION SURVEY RESULTS**

	Corn	Single-crop Soybeans	Dbl-crop Soybeans	Milo
Number reporting	11	5	2	3
Acres irrigated	109.5	128.4	94.5	136.7
Inches/application	0.84	1.01	0.7	1.5
Times irrigated	<u>2.45</u>	<u>1.40</u>	<u>2.0</u>	<u>3.0</u>
Total inches applied	2.07	1.42	1.4	4.5
Irrigated yield/ac. (bu.)	113.4	47.2	30.0	76.7
Dryland yield/ac.	<u>107.9</u>	<u>42.4</u>	<u>22.8</u>	
Increase (bu./ac.)	5.5	4.8	7.2	

Popcorn was reported once.

**16-year Survey CORN Yields, average:**

Irrigated	138.9
Dryland	96.9
Difference	42.0

**16-year Survey SOYBEAN Yields, average:**

Irrigated	44.8
Dryland	33.5
Difference	11.3

**1993 Average Corn Planting Rate (stalks per acre):**

Irrigated	26,657
Dryland	22,166

**1993 Average Fuel Cost Per Acre/Inch:**

Diesel	\$5.37
Propane	no reports
Electricity	\$4.25
Elec./diesel combination	\$7.20
Natural gas	no reports
Average (12 systems)	\$4.44

**1993 Average Repair Costs:**

Average per farm (28 systems)	\$342.39
Average per acre	\$1.85*

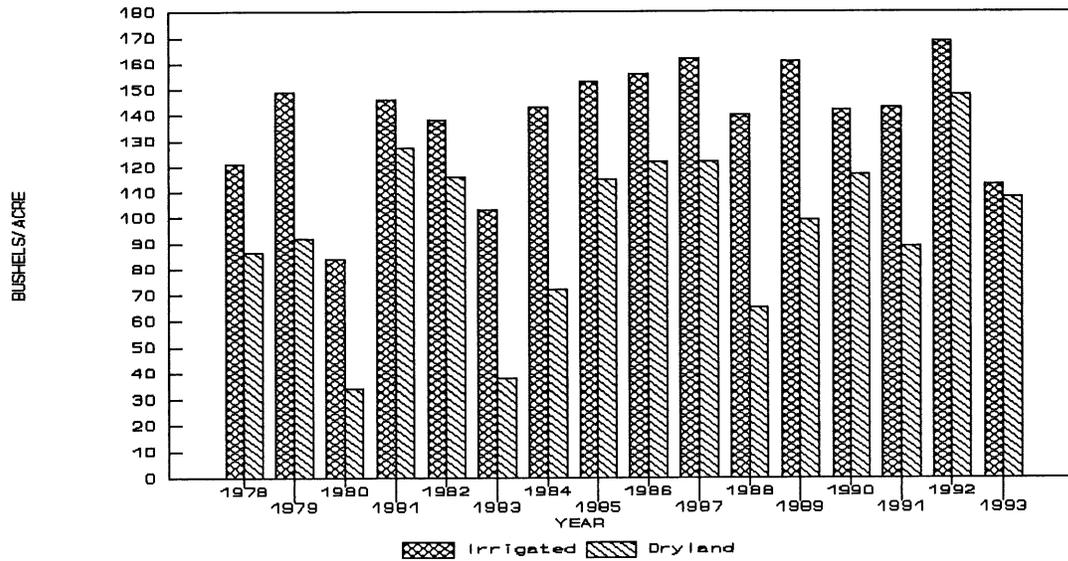
\*Includes acres planted for irrigation but not irrigated.

**Acres Planted for Irrigation, But Not Irrigated\***

	Corn	Single-crop Soybeans	Dbl-crop Soybeans
Total acres	3,674	1,795	307
No. systems	25	15	5
Average acreage	147.0	119.7	61.4
Average yield	106.8	41.3	10.8
State average:			
Irrigated yield	113.4	47.2	30.0
Dryland yield	107.9	42.4	22.8

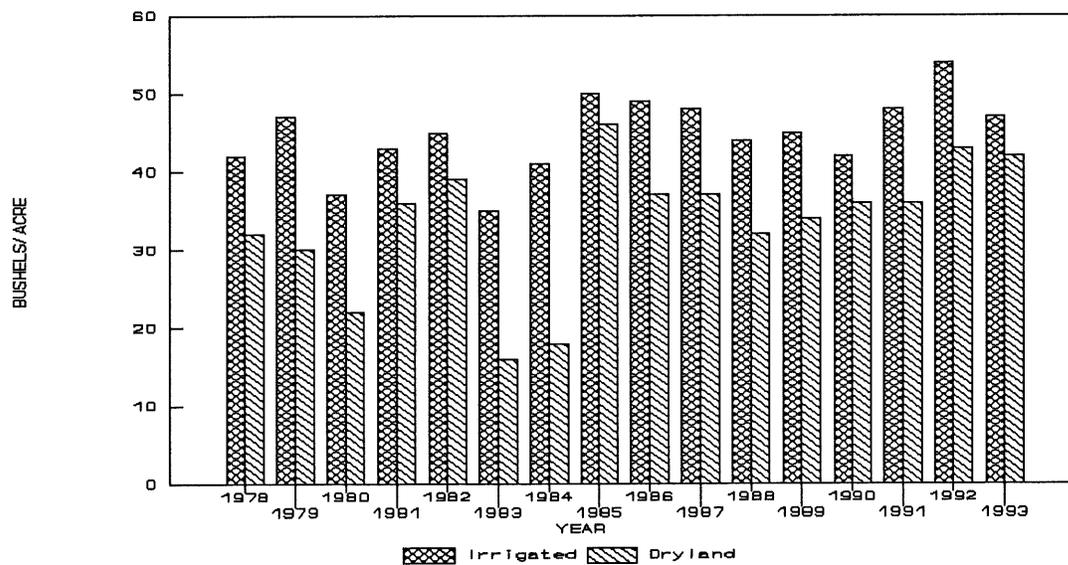
\*Thirty farms reported a total of 5,815 acres that were planted with the intention of irrigating but were not irrigated -- mainly due to adequate rainfall or flooding.

### 16-YEAR SURVEY CORN YIELDS



CORN	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Irrigated	121	149	84	146	138	103	143	153	156	162	140	161	142	143	169	113
Dryland	86	92	34	127	116	38	72	115	122	122	65	99	117	89	148	108
Increase	35	57	50	19	22	65	71	38	34	40	75	62	25	53	21	5

### 16-YEAR SURVEY SOYBEAN YIELDS



SOYBEANS	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Irrigated	42	47	37	43	45	35	41	50	49	48	44	45	42	48	54	47
Dryland	32	30	22	36	39	16	18	46	37	37	32	34	36	36	43	42
Increase	10	17	15	7	6	19	23	4	12	11	12	11	6	12	11	5

**1993 IRRIGATED CROP BUDGETS (per acre)**

	<u>Corn</u>	<u>Single-crop soybeans</u>	<u>Double-crop soybeans</u>
Yield/acre (bu.)	113.4	47.2	30.0
Price/bushel	\$2.60	\$6.50	\$6.50
Gross income/acre	\$294.84	\$306.80	\$195.00
<b>Operating Costs:</b>			
Seed	\$21.00	\$13.00	\$11.00
Fertilizer and lime	55.00	12.00	10.00
Chemicals	23.00	22.00	17.00
Machinery fuel, etc.	31.00	25.00	22.00
Drying @ 10¢	11.34		
Irrig. fuel (\$4.44/ac.-in.)	9.19	6.30	6.22
Irrigation repairs	1.85	1.85	1.85
Interest (10% x 1/2 op. costs)	<u>7.62</u>	<u>4.01</u>	<u>3.40</u>
Total operating costs/acre	\$160.00	\$84.16	\$71.47
<b>Ownership Costs:</b>			
Machinery	\$24.00	\$19.00	\$17.00
Irrig. equip. (\$400 @ 15%)	60.00	60.00	60.00
Labor	<u>25.00</u>	<u>20.00</u>	<u>17.50</u>
Total ownership costs/acre	\$109.00	\$ 99.00	\$94.50
<b>TOTAL NON-LAND COSTS/ACRE</b>	\$269.00	\$183.16	\$165.97
<b>RETURN TO LAND AND MANAGEMENT/ACRE</b>	\$25.84	\$123.64	\$29.03

**1993 INCOME CHANGE DUE TO IRRIGATION (per acre)**

	<u>Corn</u>	<u>Single-crop soybeans</u>	<u>Double-crop soybeans</u>
<b>Added Income:</b>			
Yield/acre (bu.)	5.5	4.8	7.2
Price/bushel	\$2.60	\$6.50	\$6.50
Added income/acre	\$14.30	\$31.20	\$46.80
<b>Added Operating Costs:</b>			
Seed	\$ 4.00		
Fertilizer and lime	10.00	\$3.00	\$2.00
Chemicals			
Machinery fuel, etc.			
Drying @ 10¢	.55		
Irrig. fuel (\$4.44/ac.-in.)	9.19	6.30	6.22
Irrigation repairs	1.85	1.85	1.85
Labor	5.00	5.00	5.00
Interest (10% x 1/2 op. costs)	<u>1.53</u>	<u>.81</u>	<u>.75</u>
Added operating costs/acre	\$33.12	\$16.96	\$17.92
<b>Added Income Over Added Costs:</b>	-\$18.82	\$14.24	\$30.98
<b>Added Ownership Costs:</b>			
Irrig. equip. (\$400 @ 15%)	60.00	60.00	60.00
<b>ADDED RETURN TO LAND AND MANAGEMENT/ACRE</b>	-\$78.82	-\$45.76	-\$29.02