

## **Missouri 1994 Irrigation Survey\***

Ron Plain, Extension Economist  
University of Missouri

This survey marks the seventeenth year the University of Missouri has collected data from Missouri farmers on irrigation performance. The numbers presented here are the average values for 55 irrigation systems which responded to our December 1994 survey. Each irrigation system is reported separately. Therefore, this data does not represent 55 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 8 different crops in 1994. However, yield data on irrigated milo, popcorn, apples, sunflowers, and sod are not included in this report as there were too few responses to comfortably draw conclusions.

Survey respondents included 39 irrigation systems which were used to irrigate corn in Missouri in 1994. On average each of these systems irrigated 134.8 acres of corn which produced an average yield of 167.7 bushels per acre. Dryland corn grown on these same farms produced an average yield of 107.2 bushels per acre. Thus, irrigation produced an average corn yield increase of 60.5 bushels per acre.

Soybean yield increases from irrigation averaged 17.5 bushels per acre on full-season beans and 5 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 1994 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.

**MISSOURI 1994 IRRIGATION SURVEY**  
**(excluding Bootheel)**

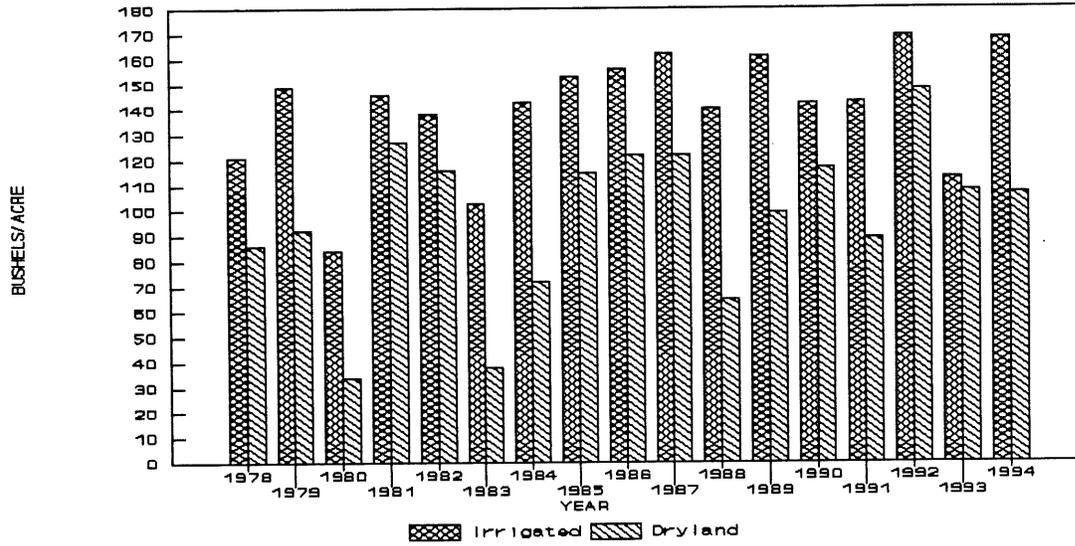
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 Ron Plain, Extension Economist

<b>Types of Systems</b>	<b>Percent</b>
Center pivot	83.6
Traveling gun	12.7
Other	3.7
 <b>Types of Water Supplies</b>	
Reservoir	49.1
Well	37.7
Lagoon	7.5
Combination, reservoir/well/stream	3.8
Stream	1.9
 <b>Types of Pumping Power</b>	
Diesel	56.1
Electricity	34.1
Diesel/electric combination	4.9
Propane/electric combination	2.4
Natural gas	2.4
 <b>Water Supply Adequate? 83% yes</b>	
<b>Reservoir Full in June? 96% yes</b>	
<b>Applied: Fertilizer through system -- 9</b>	
Insecticides through system -- 4	
Herbicides through system -- 0	

**1994 IRRIGATION SURVEY RESULTS**

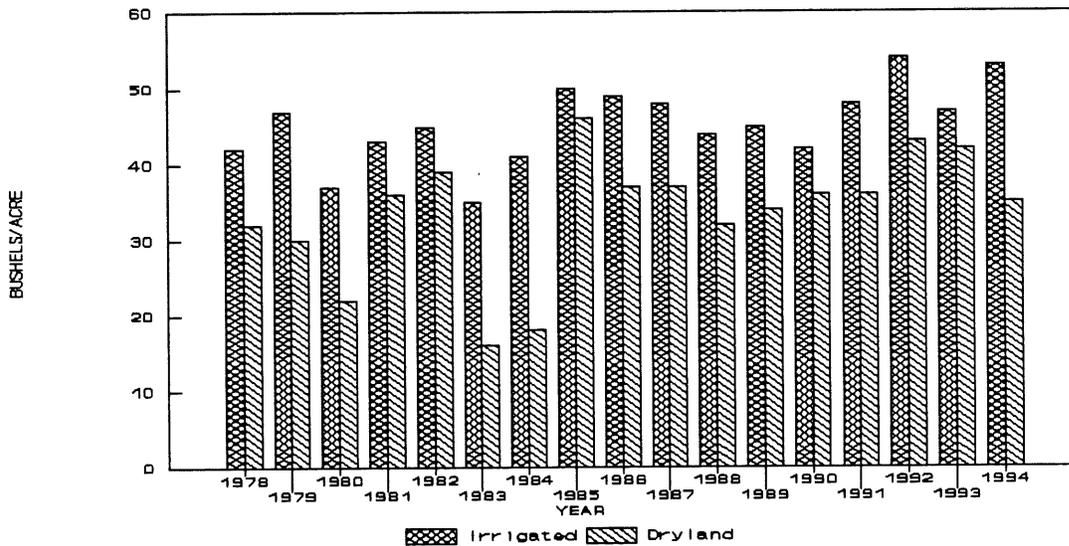
	Corn	Single-crop Soybeans	Dbl-crop Soybeans
Number reporting	39	39	7
Acres irrigated	134.8	116.8	38.3
Inches/application	1.00	.98	.81
Times irrigated	<u>5.28</u>	<u>3.98</u>	<u>4.60</u>
Total inches applied	5.29	3.91	3.74
Irrigated yield/ac. (bu.)	167.7	53.0	27.9
Dryland yield/ac.	<u>107.2</u>	<u>35.5</u>	<u>22.9</u>
Increase (bu./ac.)	60.5	17.5	5.0

### 17-YEAR SURVEY CORN YIELDS



CORN	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Irrigated	121	149	84	146	138	103	143	153	156	162	140	161	142	143	169	113	168
Dryland	86	92	34	127	116	38	72	115	122	122	65	99	117	89	148	108	107
Increase	35	57	50	19	22	65	71	38	34	40	75	62	25	53	21	5	61

### 17-YEAR SURVEY SOYBEAN YIELDS



SOYBEANS	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Irrigated	42	47	37	43	45	35	41	50	49	48	44	45	42	48	54	47	53
Dryland	32	30	22	36	39	16	18	46	37	37	32	34	36	36	43	42	35
Increase	10	17	15	7	6	19	23	4	12	11	12	11	6	12	11	5	18

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

Irrigated	140.6 bu./ac.
Dryland	97.5
Difference	43.1

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

Irrigated	45.3 bu./ac.
Dryland	33.6
Difference	11.7

**1994 Average Corn Planting Rate (stalks per acre):**

Irrigated	26,312
Dryland	22,141

**1994 Average Fuel Cost Per Acre/Inch:**

Diesel (23 systems)	\$2.91
Electricity (14 systems)	\$2.51
Elec./diesel combination (2 systems)	\$1.53
Propane/elec. combination (1 system)	\$3.87
Natural gas (1 system)	\$3.87
Average (40 systems)	\$2.70

**1994 Average Repair Costs:**

Average per farm (37 systems)	\$415.37
Average per farm (48 systems)	\$1,523.45*

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\*Includes 11 systems with repair costs of \$2,000 to \$11,000 most of which was damage from flood of 1993. The average for 37 systems includes only systems with costs under \$2,000.

**1994 IRRIGATED CROP BUDGETS (per acre)**

	<u>Corn</u>	<u>Single-crop soybeans</u>	<u>Double-crop soybeans</u>
Yield/acre (bu.)	167.7	53.0	27.9
Price/bushel	\$2.10	\$5.30	\$5.30
Gross income/acre	\$352.17	\$280.90	\$147.87
<b>Operating Costs:</b>			
Seed	\$21.00	\$13.00	\$11.00
Fertilizer and lime	55.00	12.00	10.00
Chemicals	26.00	25.00	20.00
Machinery fuel, etc.	27.00	22.00	20.00
Drying @ 10¢	16.77		
Irrig. fuel (\$4.44/ac.-in.)	14.28	10.56	10.10
Irrigation repairs	3.35	3.35	3.35
Interest (10% x 1/2 op. costs)	<u>8.17</u>	<u>4.01</u>	<u>3.40</u>
Total operating costs/acre	\$171.57	\$80.21	\$78.17
<b>Ownership Costs:</b>			
Machinery	\$27.00	\$20.00	\$18.00
Irrig. equip. (\$500 @ 15%)	75.00	75.00	75.00
Labor	<u>24.00</u>	<u>19.00</u>	<u>17.00</u>
Total ownership costs/acre	\$126.00	\$114.00	\$110.00
<b>TOTAL NON-LAND COSTS/ACRE</b>	<b>\$297.57</b>	<b>\$204.21</b>	<b>\$188.17</b>
<b>RETURN TO LAND AND MANAGEMENT/ACRE</b>	<b>\$54.60</b>	<b>\$ 76.69</b>	<b>- \$40.30</b>

**1994 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.)	60.5	17.5	5.0
Price/bushel	\$2.10	\$5.30	\$5.30
Added income/acre	\$127.05	\$92.75	\$26.50
<b>Added Operating Costs:</b>			
Seed	\$ 4.00		
Fertilizer and lime	10.00	\$3.00	\$2.00
Chemicals			
Machinery fuel, etc.			
Drying @ 10¢	6.05		
Irrig. fuel (\$2.70/ac.-in.)	14.28	10.56	10.10
Irrigation repairs	3.35	3.35	3.35
Labor	5.00	5.00	5.00
Interest (10% x 1/2 op. costs)	<u>2.13</u>	<u>1.10</u>	<u>1.02</u>
Added operating costs/acre	\$44.81	\$23.01	\$21.47
<b>Added Income Over Added Costs:</b>	\$82.24	\$69.74	\$ 5.03
<b>Added Ownership Costs:</b>			
Irrig. equip. (\$500 @ 15%)	75.00	75.00	75.00
<b>ADDED RETURN TO LAND AND MANAGEMENT/ACRE</b>	\$ 7.24	- \$ 5.26	- \$69.97