



FARM MANAGEMENT

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Newsletter

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1982 MISSOURI IRRIGATION RESULTS

This newsletter reports the results of an irrigation survey conducted in the fall of 1982. This is the seventh such report based on statewide survey data. This survey was conducted in co-operation with Area Extension Staff and farmers throughout Missouri.

1981, like 1982, was a wet year. In most areas of the state there was only a short period of time--at the end of July--when it even appeared to be feasible to irrigate. A great many farmers, of course, never turned their systems on. We estimate that only 30 to 50 percent of the farmers actually used their systems in 1982.

The data in this report are based on reports from farmers who actually irrigated in 1982. It is difficult to give real meaning to the data. In calculating the true economic costs and returns to irrigation for the state, one ought to representatively sample all farmers who own irrigation systems, and obtain information even from those who did not use their systems because of adequate rainfall. Although we received some reports from farmers who did not use their irrigation systems, the returns were heavily weighted in favor of those who actually applied water. Consequently, the figures used are based only on those who actually irrigated.

In a dry year, a voluntary survey gives fairly accurate results regarding the true economic costs of irrigation because nearly

everyone uses their system. The voluntary survey approach we've used, therefore, probably gives a reasonable reflection of the true costs and returns from irrigation in a dry year but is less accurate in a wet year.

In a wet year when not all irrigators use their systems, the data received from those who actually irrigated do not reflect the true cost of all farmers owning irrigation systems. Even those who did not irrigate incurred fixed costs and possibly debt or lease payments. This cost is not adequately reflected in a voluntary survey.

We must keep in mind, however, that even those who did not apply water may have a benefit from owning an irrigation system.

Most farmers plant heavier populations, select varieties and fertilize for the top yields even when adequate moisture is present from rainfall. For them an irrigation system becomes an insurance policy.

In Missouri, every year is different. We have had some dry years in the 1970s and the last two of the 1980s were very wet. No doubt, we will again sometime return to drought years when irrigation systems become a profitable tool. In a sub-humid area such as Missouri, we expect that some years will be wet and the system is not going to be used.

Considering that 1982 as a whole was wet, it was actually surprising that the number of farmers who did irrigate and responded to the survey. Although irrigation, in general, did not cover all the costs of those who did use their systems, on the average the additional cash costs were recovered and a contribution to fixed costs received.

The figures reported in this summary are fairly self-explanatory. But they must be interpreted under the conditions in which the data were collected and the interpretation made under the constraints that we have just discussed.

RESULTS

CORN. Farmers who irrigated cornland reported a yield of 138 bushels compared to dryland yield of 116 bushels. This gives us an increase from irrigation of 22 bushels per acre. On the average the farmers irrigated twice and applied one inch of water per application, thus resulting in an application of about two inches per acre.

The added returns and costs are shown in Table 2. Valuing the 22 bu. added yield at \$2.40, the approximate December 1 price in Central Missouri resulted in an added gross of \$52.80. The approximate additional cash cost of irrigation was \$30.80--this includes fuel, labor and repairs, plus added cost of the seed, fertilizer and harvesting expense. Fertilizer was based on approximate additional nutrients removed. Subtracting the total added cost from the added returns resulted in net cash return of \$22.

We charged \$50 depreciation. This was the same figure used last year. Since few additional systems were installed during the past year, this figure should be a reasonable approximation for many systems. The net cash return did not cover the total depreciation charges; therefore, added total return after depreciation was -\$28.00.

Considering both cash costs and depreciation, the total cost from irrigation of corn amounted to \$80.80. If one divides this figure by the 22 bu. added yield the cost of producing the added yield is \$3.67 per bu.

FIRST CROP SOYBEANS. Irrigated soybeans yielded about 45 bu. per acre compared to 39 bu. on dryland. This gives a difference of about 6 bu. per acre. Irrigators reported irrigating about 1.4 times and applying one inch of water per application. This results in about 1.4 inches of water per acre.

Using a price of \$5.57 per bu. for soybeans the 6 bu. added yield is valued at \$33.02. The total added cash cost of producing irrigated first-crop beans, as shown in Table 2, is \$11.27. Subtracting the cost from the added gross resulted in a net cash return of \$22.16. Deducting the \$50 depreciation charge resulted in a -\$27.84 return above all costs of irrigation.

The total cost of irrigating first-crop beans was \$11.26 cash costs plus \$50 depreciation for a total of \$61.26. If one divides the total cost by the added yield, the cost per bushel of growing the irrigated beans was \$10.21.

SECOND CROP BEANS. Irrigated second-crop beans yielded 30 bu. per acre compared to 23 bu. dryland second-crop beans, resulting in a yield increase of 7 bu. per acre. The yield increase on second-crop beans was quite similar to that on first-crop beans but total yield was considerably less. Irrigators reported applying one inch per application and applying the water 1.3 times, thus resulting in a total application of 1.3 inches of water to second-crop beans.

Pricing soybeans at \$5.57 resulted in an added gross from irrigation of second-crop beans of \$38.99. Estimated added cost of producing the beans was \$11.29 resulting in a net cash return of \$27.70. Deducting the \$50 depreciation charge resulted in a net added return above all costs of -\$22.30.

Combining the \$11.29 cash cost plus \$50 depreciation resulted in a total cost per acre of \$61.29. If one divides this by the 7 bu. increase the total cost of the added yield was \$8.75.

MILLO. Insufficient irrigators reported milo yields to make it legitimate to average these costs for a statewide report.

FUEL COSTS

Reported fuel cost per acre remained reasonably constant for the past three years. The 1982 fuel costs were \$3.49 per acre-inch. Table 3 reports the fuel cost for the past 7 years. Although the costs do vary for 1980, 1981, and 1982, the variation is less than 5 percent. This is probably an insignificant variation from the standpoint of making any kind of interpretation on the differences. It is reasonable to expect that these costs have not changed much. Fuel prices in these three years have remained relatively stable.

Table 4 reports the average fuel cost per acre-inch by type of fuel. It also indicates the range of costs for the different types of fuel used.

SUMMARY

The seven-year irrigated and dryland yields are summarized in Table 5. Although the response from irrigation was low in 1981 and 1982, over this seven-year period corn yield increases averaged 40 bu. per acre; first-crop beans--11 bu. per acre; and second-crop beans--10 per acre.

Although added income from irrigation covered all costs for growing irrigated crops in 1982, the net return was insufficient to cover the estimated depreciation charge. One must, of course, not make an evaluation on irrigation for a single year. If the last seven years reflect any type of long term average, then of course irrigation would be more profitable than it was the last two. It is unlikely that the last two years are typical for the future of Missouri weather.

Table 1. AVERAGE YIELD AND AMOUNT OF WATER APPLIED
(Missouri Irrigators Responding to 1982 Survey)

	CORN	SOYBEANS	
		First Crop	Second Crop
YIELD (bu./acre)			
Irrigated	138	45	30
Dryland	<u>116</u>	<u>39</u>	<u>23</u>
DIFFERENCE	22	6	7
WATER APPLIED:			
No. of Applications	2.0	1.4	1.3
Inches/Application	1.0	1.0	1.0
Total Inches	2.0	1.4	1.3

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