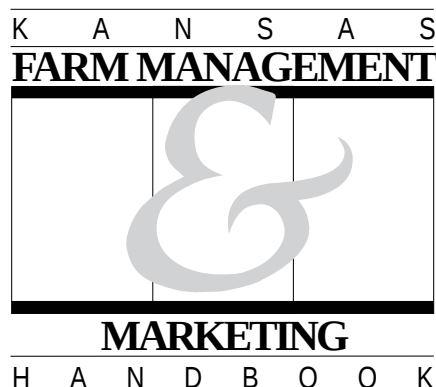




Flood-Irrigated Soybeans

Department of Agricultural Economics

Manhattan, Kansas

Daniel M. O'Brien
Extension Agricultural Economist, N.W.

James D. Sartwelle, III
Extension Agricultural Economist, S.W.

Variety development has led to new, higher-yielding soybean varieties that respond well to irrigation. Recent research has provided additional information on water management for optimum irrigation of soybeans. Soybean yields can be increased from 20 to 50 percent by irrigation, with the crops water needs being most critical during the reproductive stage. The soil moisture level should be maintained at or above 40 to 50 percent of its water holding capacity in the 0 to 24 inch depth in order to provide maximum fertilization of the flowers.

Converting dryland to flood irrigation requires \$20,000 to \$70,000 capital. Conversion cost depends on depth to water, land preparation, run of pipe required, and type of equipment purchased.

Cost Return Projections

Any land preparation costs are included with the land charge. Other investments are shown in Table 1. Price of the energy source and Total Dynamic Head are the important factors affecting pumping costs. For instance, a \$1 change in natural gas causes \$2.97 change with 100 feet TDH. However, with 500 feet of TDH, \$1 change in gas price results in \$14.83 change in costs for each acre foot of water pumped. See MF-836, *Irrigation Capital Requirements and Energy Costs*, for other examples.

Yield Level

Cost per bushel and net returns in crop production are highly dependent on yields. The following estimated budget includes three different yield levels. Yield levels vary for a number of reasons such as soil type/ land quality, weather, input levels, and management. Budgeting at multiple yield levels can help producers examine the financial risk of a crop enterprise that is directly related to production risk as well as to compare the profitability of crop enterprises on farmland tracts with varying yield potentials.

Profit and Return Factors

Net return on investment is the percentage return on investment. This measure enables comparisons to be made between enterprises as well as other investment alternatives. Asset turnover is the percentage of investment recovered by total returns. Inverting this measure allows different enterprises to be compared on the basis of capital required to generate a dollar of gross income.

Table 1. Factors Used for Cost-Return Budget

Item	Yield Level (bu.)			
	40	50	60	
Water, 260 TDH	16 in.	18 in.	20 in.	\$1.92/inch
Fertilizer:				
N (Anhy.)	0	0	0	\$0.19/lb
N (Dry)	0	0	0	\$0.29/lb
P	40	40	40	\$0.27/lb
K	0	0	0	\$0.13/lb
Lime	0	0	0	\$0.01/lb
Seed (lbs/Acre)	45	50	50	
Seed Price, \$/lb	\$0.30	\$0.30	\$0.30	
Labor Hours	2.15	2.15	2.15	
Labor Price/Hour				\$9.00
Land Value/Acre				\$605.00
Land Interest Rate				6.00%
Machinery Investment				\$195.00
Machinery Life (years)				10 yrs
Interest Rate on Machinery				10.00%
Well, Pump and Gearhead Value				\$228.00
Well, Pump and Gearhead Life (years)				15 yrs
Power Unit and Meter Value				\$39.00
Power Unit and Meter Life (years)				7 yrs
Irrigation System Value				\$33.00
Irrigation System Life (years)				10 yrs
Insurance Rate on Machinery				0.25%
Interest on Variable Costs				10.00%

COST-RETURN PROJECTION—FLOOD-IRRIGATED SOYBEANS¹

	Yield Level (bu.)			Your Farm
	40	50	60	
VARIABLE COSTS PER ACRE:				
1. Labor (2.15 hrs. × \$9.00 per hr.)	\$ 19.35	\$ 19.35	\$ 19.35	
2. Seed (___ lbs × \$.30 per lb.)	13.50	15.00	15.00	
3. Herbicide (\$26.68) and Insecticide (0.00)	26.68	26.68	26.68	
4. Fertilizer and Lime (40 lbs. P ₂ O ₅)	10.80	10.80	10.80	
5. Fuel and Oil—Crop	5.17	5.17	5.17	
6. Fuel and Oil—Pumping ²	30.72	34.56	38.40	
7. Crop Machinery Repairs	18.90	18.90	18.90	
8. Irrigation Repairs and Maintenance	3.20	3.60	4.00	
9. Crop Insurance	5.35	5.35	5.35	
10. Drying (\$___ per bu)				
11. Custom Hire (_____ operation) ³				
12. Crop Consulting	6.25	6.25	6.25	
13. Miscellaneous	7.00	7.00	7.00	
14. Interest on 1/2 Variable Cost @ 10%	7.35	7.63	7.84	
A. TOTAL VARIABLE COSTS	\$154.26	\$160.29	\$164.74	
FIXED COSTS PER ACRE:				
15. Real Estate Taxes (including well) @ 0.5%	\$ 4.17	\$ 4.17	\$ 4.17	
16. Interest on Land and Well (\$833/A × 6%) ⁴	49.98	49.98	49.98	
17. Rent for Rented Land ⁵				
18. Depreciation on Crop Machinery	12.67	12.67	12.67	
19. Interest on Crop Machinery @ 10% ⁶	13.16	13.16	13.16	
20. Depreciation on Irrigation Equipment and Well	24.07	24.07	24.07	
21. Interest on Irrigation Equipment @ 10% ⁶	15.00	15.00	15.00	
22. Insurance on Machinery and Equipment @ .25%	1.24	1.24	1.24	
B. TOTAL FIXED COSTS	\$120.29	\$120.29	\$120.29	
C. TOTAL COSTS (A + B)	\$274.55	\$280.58	\$285.03	
D. YIELD PER ACRE	40	50	60	
E. PRICE PER BUSHEL	\$ 5.55	\$ 5.55	\$ 5.55	
F. NET GOVERNMENT PAYMENTS ⁷	\$	\$	\$	
G. RETURNS PER ACRE ((D × E)+F)	\$222.00	\$277.50	\$333.00	
H. RETURNS OVER VARIABLE COSTS (G – A)	\$ 67.74	\$117.21	\$168.26	
I. RETURNS OVER TOTAL COSTS (G – C)	\$-52.55	\$ -3.08	\$ 47.97	
J. VARIABLE COSTS PER BUSHEL (A ÷ D)	\$ 3.86	\$ 3.21	\$ 2.75	
K FIXED COSTS PER BUSHEL (B ÷ D)	\$ 3.01	\$ 2.41	\$ 2.00	
L. TOTAL COSTS PER BUSHEL (C ÷ D)	\$ 6.86	\$ 5.61	\$ 4.75	
M. ASSET TURNOVER (G ÷ INVESTMENT) ⁵	44.85%	56.06%	67.28%	
N. NET RETURN ON INVESTMENT				
((I + 14 + 16 + 19 + 21) ÷ INVESTMENT) ⁸	6.65%	16.71%	27.06%	

¹See Table 1, page 1, for factors used. ²See MF-836, "Irrigation Capital Requirements and Energy Costs." If using custom hire, adjust lines 5, 7, 18, and 19. ⁴Assumes interest rate shown in Table 1. ⁵If cash rented, insert zero in lines 15 and 16. ⁶Assumes one-half the (original cost plus salvage value) at the interest rate shown in Table 1. ⁷Net government payment equals yield per acre (D) times expected deficiency payment minus prorated cost of set-aside acres. Based on 15% flex acres and 5% ARP. The price used was a five-year average price. The 1995 farm program may have major changes. ⁸Investment equals total value of all fixed assets shown in Table 1.

**COOPERATIVE EXTENSION SERVICE, MANHATTAN, KANSAS**

MF-577 Revised

October 1995

Issued in furtherance of Cooperative Extension Work, acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Richard D. Wootton, Associate Director. All educational programs and materials available without discrimination on the basis of race, color, national origin, sex, age, or disability.

File Code: Farm Management 3-1

10-95—1.5M