



Center-Pivot-Irrigated Wheat

Cost-Return Budget

Department of Agricultural Economics



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Daniel M. O'Brien

Extension Agricultural Economist, NW

Troy J. Dumler

Extension Agricultural Economist, SW

The following budget provides cost and return estimates for center pivot irrigated wheat in Western Kansas. Approximately 65 percent to 75 percent of the wheat grown under irrigation in Kansas is in the Southwest area, although only approximately 6 percent to 8 percent of Kansas wheat is produced on irrigated land. There is keen competition among such crops as corn, grain sorghum, alfalfa, and wheat for irrigated land in this area.

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, with 500 feet of TDH, \$1 change in gas price results in \$14.83 change in costs for each acre foot of water pumped.

The choice of a flood or center pivot system depends on: (1) available capital; (2) labor availability during the growing season; (3) the terrain, which may require a center pivot system; and (4) soil type. Labor requirements can be as much as 1 hour/acre less for the sprinkler system compared with flood irrigation. MF-836, *Irrigation Capital Requirements and Energy Costs*, shows the ranges of costs and the amounts used in this budget.

Expected Yields and Enterprise Returns

Cost per bushel and net returns in crop production are highly dependent on yields. The following estimated budget includes three different yield levels. The three yield levels are intended to represent expected yields of varying land quality for a given level of management. Land values, government payments, and various inputs vary as yield levels vary. Crop insurance was not included in this budget as an input expense because yields reflect an average of all years (good and bad). If crop insurance is included as an input expense, than an expected value for indemnity payments should be included in the returns section. Historically, MPCI indemnity payments have exceeded premiums due to government subsidies.

Budgeting for alternative expected yields can help producers compare the profitability of crop enterprises on farmland tracts with varying yield potentials. In customizing this budget to fit your farm, attention should be given to using land values representative of your farm's productive capacity. Projections of net percentage return on investment permit comparisons to be made among alternative enterprises or other investments.

Table 1. Factors Used for Cost-Return Budget

Item	Yield Level (bu)			
	41	48	55	
Water, 325 TDH	10 in	10 in	10 in	\$2.72/inch
Fertilizer:				
N (Anhy.)	50	60	70	\$0.11/lb
N (Dry)	0	0	0	\$0.20/lb
P	30	30	30	\$0.22/lb
K	0	0	0	\$0.14/lb
Lime	0	0	0	\$0.01/lb
Seed, lbs.	75	90	90	
Seed price, \$/lb	\$0.078	\$0.078	\$0.078	
Labor hours	1.78	1.85	1.92	
Labor price/hour				\$10.80
Land value/acre	\$550	\$687	\$824	
Land interest rate				6.00%
Land real estate tax				0.50%
Machinery investment				\$190
Machinery life				10 yrs
Salvage value				35%
Well, pump and gearhead value				\$317.42
Well, pump and gearhead life				15 yrs
Power unit and meter value				\$41.27
Power unit and meter life				7 yrs
Irrigation system value				\$359.00
Irrigation system life				10 yrs
Interest rate on machinery and equipment				9.00%
Insurance rate on machinery and equipment				0.25%
Interest on variable costs				9.00%

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED WHEAT

	Yield Level (bu)			Your Farm
	41	48	55	
VARIABLE COSTS PER ACRE: ¹				
1. Labor	\$ 19.20	\$ 19.98	\$ 20.76	
2. Seed	5.82	6.98	6.98	
3. Herbicide	4.90	4.90	4.90	
4. Insecticide				
5. Fertilizer and Lime	12.10	13.20	14.30	
6. Fuel and Oil — Crop	6.90	7.18	7.46	
7. Fuel and Oil — Pumping ²	27.20	27.20	27.20	
8. Machinery and Equipment Repairs	13.61	14.16	14.71	
9. Irrigation Repairs and Maintenance	3.00	3.00	3.00	
10. Crop Insurance				
11. Drying				
12. Custom Hire ³				
13. Crop Consulting	5.25	5.25	5.25	
14. Miscellaneous	8.00	8.00	8.00	
15. Interest on 1/2 Variable Costs	4.77	4.94	5.07	
A. TOTAL VARIABLE COSTS	\$ 110.75	\$114.80	\$ 117.63	
FIXED COSTS PER ACRE: ¹				
16. Real Estate Taxes (including well)	4.34	5.02	5.71	
17. Interest on Land and Well ⁴	52.05	60.27	68.49	
18. Rent for Rented Land ⁵				
19. Depreciation on Crop Machinery	12.35	12.35	12.35	
20. Interest on Crop Machinery ⁶	11.54	11.54	11.54	
21. Depreciation on Irrigation Equipment and Well	62.96	62.96	62.96	
22. Interest on Irrigation Equipment ⁶	18.01	18.01	18.01	
23. Insurance on Machinery and Equipment	1.48	1.48	1.48	
B. TOTAL FIXED COSTS	\$ 162.72	\$171.62	\$ 180.53	
C. TOTAL COSTS (A + B)	\$ 273.47	\$286.42	\$ 298.16	
D. YIELD PER ACRE	41	48	55	
E. PRICE PER BUSHEL ⁷	\$ 3.03	\$ 3.03	\$ 3.03	
F. NET GOVERNMENT PAYMENT ⁷	\$ 10.72	\$ 11.65	\$ 12.58	
G. INDEMNITY PAYMENTS	\$	\$	\$	
H. MISCELLANEOUS INCOME	\$	\$	\$	
I. RETURNS PER ACRE [(D × E) + F + G + H]	\$ 134.95	\$157.09	\$ 179.23	
J. RETURNS OVER VARIABLE COSTS (I – A)	\$ 24.20	\$ 42.29	\$ 61.60	
K. RETURNS OVER TOTAL COSTS (I – C)	\$138.52	\$129.33	\$118.93	
L. VARIABLE COSTS PER BUSHEL (A ÷ D)	\$ 2.70	\$ 2.39	\$ 2.14	
M. TOTAL COSTS PER BUSHEL (C ÷ D)	\$ 6.67	\$ 5.97	\$ 5.42	
N. NET RETURN ON INVESTMENT				
[(K+15+17+20+22) ÷ INVESTMENT] ⁸	–3.58%	–2.17%	–0.91%	

¹Totals were derived using information listed in Table 1. ²See MF-836, "Irrigation Capital Requirements and Energy Costs." ³If using custom hire, adjust lines 6, 8, 19, and 20. ⁴Assumes interest rate shown in Table 1. ⁵If cash rented, insert zero in lines 16 and 17. ⁶Assumes one-half the average investment [(initial investment + salvage value) ÷ 2] at the interest rate shown in Table 1. ⁷See MF-1013 "Prices for Crop and Livestock Cost-Return Budgets" and MF-2236 "Government Program Payments for Crop Cost Return Budgets" for additional information on crop prices and program payments. ⁸Investment equals total value of all fixed assets shown in Table 1.

Publications from Kansas State University are available on the World Wide Web at: <http://www.oznet.ksu.edu>

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Troy J. Dumler and Daniel M. O'Brien, *Center-Pivot-Irrigated Wheat Cost-Return Budget*, Kansas State University, October 1999.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-583

October 1999

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. 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, Marc A. Johnson, Director.

File code: Farm Management 3-1