

Center-Pivot-Irrigated Corn

Cost-Return Budget in Western Kansas

Department of Agricultural Economics — www.agmanager.info

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Kevin C. Dhuyvetter
Agricultural Economist
Farm Management

Daniel M. O'Brien
Agricultural Economist
Crop Marketing

Lucas Haag
Crops and Soils, NW

John Holman
Cropping Systems
Agronomist

The information in this projected budget reflects expected income and costs based on typical production practices in the region. These values should be used as a guide, but individuals are encouraged to use their own values reflecting their specific land productive capabilities and farming system when looking at the potential costs and returns for their operations.

Income Per Acre

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budgets include three different yield levels, which are intended to represent expected yields for land of varying quality for a given level of management. Yield levels are based on historical data from the Kansas Farm Management Association in the region, adjusting for trends over time. Cash rent for land has been adjusted for alternative yield levels in this budget. In customizing a budget to your farm, attention should be given to using land values (i.e., rents) that are representative of your farm's productive capacity and local farmland market conditions.

Output price represents an expected harvest price in the region. Typically a reasonable price forecast for most crops is to use the futures market adjusted by the historical basis

for a particular location, where basis equals cash price minus futures price. Silage prices are based on corresponding crop prices. See MF1013 for more detailed information on price forecasts.

Because the yields used in the budgets reflect average expected yields, there is no crop insurance indemnity payment included in income. Crop insurance premiums will vary tremendously based on many factors (proven yield, coverage level, type of insurance policy). Crop insurance premiums included as costs reflect an expected net premium paid on average given the expected revenue.

Costs Per Acre

Production costs at the three yield levels are shown on lines 1 through 13. Projected Kansas Custom Rates for specific field operations are used to represent fuel and labor costs as well as machinery repair, depreciation, and interest expenses. Table 1 identifies seed, fertilizer, herbicide, and insecticide/fungicide costs. Fertilizer rates are based on removal with adjustments for local conditions. Table 1 also includes inches of irrigation water applied and pumping cost per inch. Table 2 outlines the machinery operations assumed, investment in irrigation equipment, non-machinery labor, and land cash rent.

Table 1A. Production Inputs — Center-Pivot-Irrigated Corn — SW Kansas

Item	Yield Level (bu/a)			
	170	210	250	
Seed, 1,000/a*	26	32	36	\$3.52/1,000
Fertilizer:				
N (anhydrous)	0	0	0	\$0.39/lb
N	137	169	201	\$0.55/lb
P	60	74	88	\$0.52/lb
K	0	0	0	\$0.45/lb
Lime	0	0	0	\$0.015/lb
Herbicide				
Burndown	1	1	1	\$13.67/a
Preemergence	1	1	1	\$42.44/a
Postemergence	0.5	0.5	0.5	\$9.78/a
Insecticide / Fungicide				
Fungicide	0.2	0.3	0.3	\$16.91/a
Insecticide	1	1	1	\$11.47/a
Irrigation water, in	12	18	24	\$3.03/in

*Triple-stack seed with refuge

Irrigated Crops 8 — Revised February 2014

Table 1B. Production Inputs — Center-Pivot-Irrigated Corn — NW Kansas

Item	Yield Level (bu/a)			
	215	239	263	
Seed, 1,000/a*	28	32	35	\$3.52/1,000
Fertilizer:				
N (anhydrous)	0	0	0	\$0.39/lb
N	173	192	211	\$0.55/lb
P	75	84	92	\$0.52/lb
K	0	0	0	\$0.45/lb
Lime	0	0	0	\$0.015/lb
Herbicide				
Burndown	1	1	1	\$13.67/a
Preemergence	1	1	1	\$42.44/a
Postemergence	0.5	0.5	0.5	\$9.78/a
Insecticide / Fungicide				
Fungicide	0.3	0.3	0.3	\$16.91/a
Insecticide	0.5	0.5	0.5	\$11.47/a
Irrigation water, in	12	18	24	\$3.03/in

*Triple-stack seed with refuge

Table 2A. Machinery and Land Resources — Center-Pivot-Irrigated Corn – SW Kansas

Item	Yield Level (bu/a)			Custom
	170	210	250	Rate
Tillage/Planting/Chemical Applications:				
Chisel	0	0	0	\$10.77/a
Disk	0	0	0	\$10.56/a
Strip-till	1	1	1	\$16.64/a
Plant	1	1	1	\$17.19/a
Anhydrous application	0	0	0	\$12.33/a
Fertilizer application	0	0	0	\$6.27/a
Herbicide application	2.5	2.5	2.5	\$5.87/a
Insecticide / fungicide application	1.2	1.3	1.3	\$6.93/a
Harvest				
Base charge	1	1	1	\$28.03/a
Extra charge for yields exceeding	65	65	65	\$0.240/bu
Hauling	170	210	250	\$0.190/bu
Non-machinery labor	1.20	1.20	1.20	\$15.00/hr
Irrigation labor	0.50	0.50	0.50	\$15.00/hr
Land charge/rent	\$74.00	\$109.00	\$144.00	
Interest on capital				6.5%
Irrigation Equipment	Investment, \$/a		Years	Salvage value
Well, pump and gearhead value	\$440.00		25	0%
Power unit and meter	\$131.00		7	0%
Irrigation system	\$575.00		25	25%

Table 2B. Machinery and Land Resources — Center-Pivot-Irrigated Corn – NW Kansas

Item	Yield Level (bu/a)			Custom Rate
	215	239	263	
Tillage/Planting/Chemical Applications:				
Chisel	0	0	0	\$10.78/a
Disk	0	0	0	\$9.99/a
Strip-till	1	1	1	\$16.64/a
Plant	1	1	1	\$16.99/a
Anhydrous application	0	0	0	\$12.10/a
Fertilizer application	0	0	0	\$6.21/a
Herbicide application	2.8	2.8	2.8	\$5.79/a
Insecticide / fungicide application	0.8	0.8	0.8	\$7.23/a
Harvest				
Base charge	1	1	1	\$28.07/a
Extra charge for yields exceeding	65	65	65	\$0.240/bu
Hauling	215	239	263	\$0.200/bu
Non-machinery labor	1.20	1.20	1.20	\$15.00/hr
Irrigation labor	0.50	0.50	0.50	\$15.00/hr
Land charge/rent	\$101.00	\$145.00	\$189.00	
Interest on capital				6.5%
Irrigation Equipment	Investment, \$/a		Years	Salvage value
Well, pump and gearhead value	\$440.00		25	0%
Power unit and meter	\$131.00		7	0%
Irrigation system	\$575.00		25	25%

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED CORN — SOUTHWEST KANSAS

	Yield Level (bu/a)			Your Farm
	170	210	250	
INCOME PER ACRE				
A. Yield per acre.....	170	210	250	
B. Price per bushel	\$ 4.94	\$ 4.94	\$ 4.94	
C. Net government payment	\$	\$	\$	
D. Indemnity payments	\$	\$	\$	
E. Miscellaneous income.....	\$	\$	\$	
F. Returns/acre ((A × B) + C + D + E).....	\$ 839.80	\$ 1,037.40	\$ 1,235.00	
COSTS PER ACRE				
1. Seed	\$ 91.52	\$ 112.64	\$ 126.72	
2. Herbicide	61.00	61.00	61.00	
3. Insecticide / Fungicide	14.85	16.54	16.54	
4. Fertilizer and Lime	106.55	131.43	156.31	
5. Crop Consulting	6.50	6.50	6.50	
6. Crop Insurance*	19.55	27.48	35.40	
7. Drying	22.10	27.30	32.50	
8. Miscellaneous.....	10.00	10.00	10.00	
9. Custom Hire / Machinery Expense	142.35	160.24	177.44	
10. Non-machinery Labor	18.00	18.00	18.00	
11. Irrigation				
a. Labor	7.50	7.50	7.50	
b. Fuel and Oil.....	36.36	54.54	72.72	
c. Repairs and Maintenance	3.96	5.94	7.92	
d. Depreciation on Equipment and Well.....	53.56	53.56	53.56	
e. Interest on Equipment and Well	41.92	41.92	41.92	
12. Land Charge / Rent.....	74.00	109.00	144.00	
G. SUB TOTAL	\$ 709.72	\$ 843.59	\$ 968.04	
13. Interest on ½ Nonland Costs	16.84	19.88	22.62	
H. TOTAL COSTS	\$ 726.56	\$ 863.48	\$ 990.66	
I. RETURNS OVER COSTS (F - H)	\$ 113.24	\$ 173.92	\$ 244.34	
J. TOTAL COSTS/BUSHEL (H ÷ A)	\$ 4.27	\$ 4.11	\$ 3.96	
K. RETURN TO ANNUAL COST (I + 13) ÷ G	18.33%	22.97%	27.58%	

* Reflects expected net premium paid.

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED CORN — NORTHWEST KANSAS

	Yield Level (bu/a)			Your Farm
	215	239	263	
INCOME PER ACRE				
A. Yield per acre	215	239	263	
B. Price per bushel	\$ 4.70	\$ 4.70	\$ 4.70	
C. Net government payment	\$	\$	\$	
D. Indemnity payments	\$	\$	\$	
E. Miscellaneous income	\$	\$	\$	
F. Returns/acre ((A × B) + C + D + E)	\$ 1,010.50	\$ 1,123.30	\$ 1,236.10	
COSTS PER ACRE				
1. Seed	\$ 98.56	\$ 112.64	\$ 123.20	
2. Herbicide	61.00	61.00	61.00	
3. Insecticide / Fungicide	10.81	10.81	10.81	
4. Fertilizer and Lime	134.15	149.28	163.89	
5. Crop Consulting	6.50	6.50	6.50	
6. Crop Insurance*	28.08	31.77	35.46	
7. Drying	27.95	31.07	34.19	
8. Miscellaneous.....	10.00	10.00	10.00	
9. Custom Hire / Machinery Expense	162.70	173.26	183.82	
10. Non-machinery Labor	18.00	18.00	18.00	
11. Irrigation				
a. Labor	7.50	7.50	7.50	
b. Fuel and Oil.....	36.36	54.54	72.72	
c. Repairs and Maintenance	3.96	5.94	7.92	
d. Depreciation on Equipment and Well.....	53.56	53.56	53.56	
e. Interest on Equipment and Well	41.92	41.92	41.92	
12. Land Charge / Rent.....	101.00	145.00	189.00	
G. SUB TOTAL	\$ 802.05	\$ 912.79	\$ 1,019.48	
13. Interest on ½ Nonland Costs	18.77	20.84	22.78	
H. TOTAL COSTS	\$ 820.82	\$ 933.63	\$ 1,042.26	
I. RETURNS OVER COSTS (F - H)	\$ 189.68	\$ 189.67	\$ 193.84	
J. TOTAL COSTS/BUSHEL (H ÷ A)	\$ 3.82	\$ 3.91	\$ 3.96	
K. RETURN TO ANNUAL COST (I + 13) ÷ G	25.99%	23.06%	21.25%	

* Reflects expected net premium paid.

Publications from Kansas State University are available at: www.ksre.ksu.edu

Publications are reviewed or revised annually by appropriate faculty to reflect current research and practice. Date shown is that of publication or last revision. Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Kevin C. Dhuyvetter et al., *Center-Pivot-Irrigated Corn Cost-Return Budget in Western Kansas*, Kansas State University, February 2014.