



# Center-Pivot-Irrigated Wheat

## Cost-Return Budget

Department of Agricultural Economics



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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 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 per 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.

### Yield Goals, Return Factors

Cost per bushel and net returns in crop production are highly dependent on yields. The following estimated budget includes three different yield levels. Yield goals vary for a number of reasons such as soil type/ land quality, historical weather patterns, input levels, and management. Budgeting for alternative yield goals can help producers compare the profitability of crop enterprises on farmland tracts with varying yield potentials.

Multi-peril crop insurance expenses at a 65 percent yield level are included in this budget as a cost of managing

production risk in an area prone to great yield variability. Land values have been adjusted for alternative yield goals in this budget. 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) |        |        |             |
|-------------------------------|------------------|--------|--------|-------------|
|                               | 55               | 70     | 85     |             |
| Water, 325 TDH                | 10 in            | 10 in  | 10 in  | \$1.95/inch |
| Fertilizer:                   |                  |        |        |             |
| N (Anhy.)                     | 60               | 75     | 90     | \$0.15/lb   |
| N (Dry)                       | 0                | 0      | 0      | \$0.23/lb   |
| P                             | 30               | 30     | 30     | \$0.27/lb   |
| K                             | 0                | 0      | 0      | \$0.14/lb   |
| Lime                          | 0                | 0      | 0      | \$0.0045/lb |
| Seed, lbs                     | 75               | 90     | 90     |             |
| Seed price, \$/lb             | \$0.09           | \$0.09 | \$0.09 |             |
| Labor hours                   | 1.78             | 1.85   | 1.92   |             |
| Labor price/hour              |                  |        |        | \$10.80     |
| Land value/acre               | \$495            | \$620  | \$745  |             |
| Land interest rate            |                  |        |        | 6.00%       |
| Land real estate tax rate     |                  |        |        | 0.50%       |
| Machinery investment          |                  |        |        | \$190       |
| Machinery life                |                  |        |        | 10 yrs      |
| Salvage value                 |                  |        |        | 35.00%      |
| Interest rate on machinery    |                  |        |        | 10.00%      |
| 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       |
| Irrigation system life        |                  |        |        | 10 yrs      |
| Insurance rate on machinery   |                  |        |        | 0.25%       |
| Interest on variable costs    |                  |        |        | 10.00%      |

**COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED WHEAT**

|                                                         | Yield Level (bu) |           |           | Your Farm |
|---------------------------------------------------------|------------------|-----------|-----------|-----------|
|                                                         | 55               | 70        | 85        |           |
| VARIABLE COSTS PER ACRE: <sup>1</sup>                   |                  |           |           |           |
| 1. Labor .....                                          | \$ 19.20         | \$ 19.98  | \$ 20.76  |           |
| 2. Seed .....                                           | 6.75             | 8.10      | 8.10      |           |
| 3. Herbicide .....                                      | 4.92             | 4.92      | 4.92      |           |
| 4. Insecticide .....                                    |                  |           |           |           |
| 5. Fertilizer and Lime .....                            | 17.10            | 19.35     | 21.60     |           |
| 6. Fuel and Oil — Crop .....                            | 5.33             | 5.55      | 5.77      |           |
| 7. Fuel and Oil — Pumping <sup>2</sup> .....            | 19.50            | 19.50     | 19.50     |           |
| 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 .....                                | 4.41             | 4.75      | 5.79      |           |
| 11. Drying .....                                        |                  |           |           |           |
| 12. Custom Hire <sup>3</sup> .....                      |                  |           |           |           |
| 13. Crop Consulting .....                               | 5.25             | 5.25      | 5.25      |           |
| 14. Miscellaneous .....                                 | 8.00             | 8.00      | 8.00      |           |
| 15. Interest on 1/2 Variable Costs .....                | 5.35             | 5.63      | 5.87      |           |
| A. TOTAL VARIABLE COSTS .....                           | \$ 112.42        | \$118.19  | \$ 123.27 |           |
| FIXED COSTS PER ACRE: <sup>1</sup>                      |                  |           |           |           |
| 16. Real Estate Taxes (including well) .....            | 4.06             | 4.69      | 5.31      |           |
| 17. Interest on Land and Well <sup>4</sup> .....        | 48.75            | 56.25     | 63.75     |           |
| 18. Rent for Rented Land <sup>5</sup> .....             |                  |           |           |           |
| 19. Depreciation on Crop Machinery .....                | 12.35            | 12.35     | 12.35     |           |
| 20. Interest on Crop Machinery <sup>6</sup> .....       | 12.83            | 12.83     | 12.83     |           |
| 21. Depreciation on Irrigation Equipment and Well ..... | 62.96            | 62.96     | 62.96     |           |
| 22. Interest on Irrigation Equipment <sup>6</sup> ..... | 20.01            | 20.01     | 20.01     |           |
| 23. Insurance on Machinery and Equipment .....          | 1.48             | 1.48      | 1.48      |           |
| B. TOTAL FIXED COSTS .....                              | \$ 162.43        | \$170.55  | \$ 178.68 |           |
| C. TOTAL COSTS (A + B) .....                            | \$ 274.85        | \$288.74  | \$ 301.95 |           |
| D. YIELD PER ACRE .....                                 | 55               | 70        | 85        |           |
| E. PRICE PER BUSHEL <sup>7</sup> .....                  | \$ 2.80          | \$ 2.80   | \$ 2.80   |           |
| F. NET GOVERNMENT PAYMENT <sup>7</sup> .....            | \$ 11.77         | \$ 12.80  | \$ 13.82  |           |
| G. INDEMNITY PAYMENTS .....                             | \$               | \$        | \$        |           |
| H. MISCELLANEOUS INCOME .....                           | \$               | \$        | \$        |           |
| I. RETURNS PER ACRE [(D × E) + F + G + H] .....         | \$ 165.77        | \$208.80  | \$ 251.82 |           |
| J. RETURNS OVER VARIABLE COSTS (I – A) .....            | \$ 53.35         | \$ 90.61  | \$ 128.55 |           |
| K. RETURNS OVER TOTAL COSTS (I – C) .....               | \$ -109.08       | \$ -79.94 | \$ -50.13 |           |
| L. VARIABLE COSTS PER BUSHEL (A ÷ D) .....              | \$ 2.04          | \$ 1.69   | \$ 1.45   |           |
| M. TOTAL COSTS PER BUSHEL (C ÷ D) .....                 | \$ 5.00          | \$ 4.12   | \$ 3.55   |           |
| N. NET RETURN ON INVESTMENT                             |                  |           |           |           |
| [(K+15+17+20+22) ÷ INVESTMENT] <sup>8</sup> .....       | -1.58%           | 0.97%     | 3.17%     |           |

<sup>1</sup>Totals were derived using information listed in Table 1. <sup>2</sup>See MF-836, "Irrigation Capital Requirements and Energy Costs." <sup>3</sup>If using custom hire, adjust lines 6, 8, 19, and 20. <sup>4</sup>Assumes interest rate shown in Table 1. <sup>5</sup>If cash rented, insert zero in lines 16 and 17. <sup>6</sup>Assumes one-half the average investment [(initial investment + salvage value) ÷ 2] at the interest rate shown in Table 1. <sup>7</sup>See 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. <sup>8</sup>Investment equals total value of all fixed assets shown in Table 1.

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