# Wheat Cost-Return Budget in North Central Kansas

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The state of Kansas ranks first in the nation in total bushels of wheat production. Wheat is also the leading crop in terms of total acreage statewide and in the north central region of the state. Traditionally, wheat production in north central Kansas was predominantly under wheat-fallow and continuous wheat production systems. However, wheat production patterns have changed over time as producers have switched from traditional wheat-fallow rotations and continuous wheat production systems to more intensive crop production systems. This transition has been encouraged by increased planting flexibility in the 1996 Federal Agricultural Improvement and Reform Act and by the increased adoption of technology allowing for less tillage and more rotation with crops such as grain sorghum, corn, and soybeans.

While wheat-fallow production systems have declined substantially in the region, both continuous wheat and rotation wheat cropping systems currently exist in north central Kansas. The presence of both production systems suggests that neither system is "best" in all situations, but may be dependent on soil productivity, moisture availability, and other growing and management considerations. An advantage of continuous wheat is that it requires less management than a rotation involving various fall-harvested crops. With continuous wheat, labor requirements tend to be confined to several key times throughout the year, such as at planting and harvest. This can be either an advantage or a disadvantage depending on the particular operation. Another characteristic of continuous wheat is that it typically involves tillage operations because of weed and disease problems that can build up in a no-till mono-crop environment. For producers that prefer not to use herbicides, a cropping system that relies on tillage is attractive. However, a potential disadvantage of a cropping system that relies heavily on tillage is that labor availability may be an issue. This is especially true for producers wanting to increase the size of their operation because labor availability is often a constraint.

Wheat produced in rotation with other crops can produce increased yields compared to continuous wheat cropping systems. K-State research studies over time have consistently found yield increases for wheat grown in rotation compared to continuous wheat cropping systems, except when following grain sorghum, where several factors could potentially reduce yields. Although wheat grown in rotation may be higher yielding, it may also have higher input costs, due to increased seeding and fertility rates. However, other costs could be reduced due to reduced tillage compared with continuous wheat.

It is important to recognize that both continuous wheat and rotation wheat have their advantages and disadvantages. When comparing costs and returns from the two budgets, it is necessary to account for the differing yield levels and input requirements for wheat production and also the costs and returns from whichever crop may be grown in rotation with wheat. Ultimately, the cropping system individual producers will choose depends on their unique set of capital and management resources.

**Table 1A.** *Production Inputs — Rotation Wheat*

| | Yield Level (bu) | | | |
|---|---|---|---|---|
| Item | 40 | 49 | 59 | |
| Seed, lbs | 120 | 120 | 120 | $0.09/lb |
| Fertilizer: | | | | |
| N (anhydrous) | 0 | 0 | 0 | $0.13/lb |
| N | 70 | 87 | 104 | $0.22/lb |
| P | 22 | 27 | 33 | $0.22/lb |
| K | 0 | 0 | 0 | $0.14/lb |
| Lime | 500 | 500 | 500 | $0.01/lb |
| Herbicide | | | | |
| Finesse | 0.3 | 0.3 | 0.3 | $14.41/oz |
| + Surfactant | 1.0 | 1.0 | 1.0 | $1.00/ac |
| Insecticide / Fungicide | | | | |

**Table 1B.** *Production Inputs — Continuous Wheat*

| | Yield Level (bu) | | | |
|---|---|---|---|---|
| Item | 36 | 45 | 53 | |
| Seed, lbs | 100 | 100 | 100 | $0.09/lb |
| Fertilizer: | | | | |
| N (anhydrous) | 58 | 72 | 85 | $0.13/lb |
| N | 6 | 7 | 9 | $0.22/lb |
| P | 20 | 25 | 29 | $0.22/lb |
| K | 0 | 0 | 0 | $0.14/lb |
| Lime | 500 | 500 | 500 | $0.01/lb |
| Herbicide | | | | |
| Finesse | 0.3 | 0.3 | 0.3 | $14.41/oz |
| + Surfactant | 1.0 | 1.0 | 1.0 | $1.00/ac |
| Insecticide / Fungicide | | | | |

## 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 Kansas Agricultural Statistics Service and the North Central Kansas Farm Management Association, adjusting for trends over time. Based on K-State research findings, the yield for wheat in rotation is estimated to be higher than for continuous wheat. Land values and government payments have been adjusted for alternative yield levels in this budget. In customizing a budget to your farm, attention should be given to using land values representative of your farm's productive capacity as well as government payments specific to your land.

Price per bushel represents an expected harvest price in Beloit, KS, accounting for government marketing loan price support levels. Wheat producers in other areas of north central Kansas should use an expected price that is representative for their location. Typically, a reasonable forecast for price is to use the futures market adjusted by the historical basis for a particular location, where basis equals cash price minus futures price.

Crop insurance was not included as an input expense in this budget because yields reflect an average of all years (good and bad). If crop insurance is included as an input expense, then an expected value for indemnity payments should be included in the returns section.

## Costs Per Acre

Production costs at the three production levels are shown on lines 1 through 13. Kansas Custom Rates for specific field operations are used to represent fuel and labor costs as well as machinery repair, depreciation, and interest expenses in these budgets. Tables 1A and 1B identify the typical seed,

**Table 2A.** *Machinery and Land Resources — Rotation Wheat*

| ITEM | Yield Level (bu) 40 | 49 | 59 | |
|---|---|---|---|---|
| Tillage/Planting/Chemical Applications: | | | | |
| Chisel | 0 | 0 | 0 | $7.89/ac |
| Disk | 0 | 0 | 0 | $6.27/ac |
| Field cultivate | 0 | 0 | 0 | $5.70/ac |
| No-till drill | 1 | 1 | 1 | $10.62/ac |
| Anhydrous application | 0 | 0 | 0 | $5.77/ac |
| Fertilizer application | 1 | 1 | 1 | $3.54/ac |
| Herbicide application | 1 | 1 | 1 | $3.60/ac |
| Insecticide / fungicide application | 0 | 0 | 0 | $3.68/ac |
| Harvest | | | | |
| Base charge | 1 | 1 | 1 | $13.76/ac |
| Extra charge for yields exceeding | 21 | 21 | 21 | $0.130/bu |
| Hauling | 40 | 49 | 59 | $0.129/bu |
| Non-machinery labor | 1.25 | 1.25 | 1.25 | $10.00/hr |
| Irrigation labor | 0.00 | 0.00 | 0.00 | $10.00/hr |
| Land value/acre | $556 | $695 | $834 | 5.75% |
| Interest on capital | | | | 8.0% |

**Table 2B.** *Machinery and Land Resources — Continous Wheat*

| ITEM | Yield Level (bu) 36 | 45 | 53 | |
|---|---|---|---|---|
| Tillage/Planting/Chemical Applications: | | | | |
| Chisel | 1 | 1 | 1 | $7.89/ac |
| Disk | 1 | 1 | 1 | $6.27/ac |
| Field cultivate | 1 | 1 | 1 | $5.70/ac |
| Drill | 1 | 1 | 1 | $7.01/ac |
| Anhydrous application | 1 | 1 | 1 | $5.77/ac |
| Fertilizer application | 0 | 0 | 0 | $3.54/ac |
| Herbicide application | 1 | 1 | 1 | $3.60/ac |
| Insecticide / fungicide application | 0 | 0 | 0 | $3.68/ac |
| Harvest | | | | |
| Base charge | 1 | 1 | 1 | $13.76/ac |
| Extra charge for yields exceeding | 21 | 21 | 21 | $0.130/bu |
| Hauling | 36 | 45 | 53 | $0.129/bu |
| Non-machinery labor | 1.25 | 1.25 | 1.25 | $10.00/hr |
| Irrigation labor | 0.00 | 0.00 | 0.00 | $10.00/hr |
| Land value/acre | $556 | $695 | $834 | 5.75% |
| Interest on capital | | | | 8.0% |

fertilizer, herbicide, and insecticide requirements (rate and cost/unit) for continuous wheat and rotation wheat cropping systems, respectively. Since wheat planting follows the harvest of a fall-harvested crop in rotation systems, seeding rates are assumed to be higher under rotation to accommodate planting dates that may be later than with continuous wheat. Fertilizer requirements are higher for rotation wheat than for continuous wheat, corresponding with higher yield expectations. Herbicide requirements include both pre-crop and in-crop treatments.

Tables 2A and 2B outline the machinery and land resources used for wheat in these alternative cropping systems. Each tillage, planting, and harvest operation is identified. Given the increasing level of no-till adoption across Kansas, the rotation wheat budget is assumed to be a no-till system. Due to the increased reliance on tillage for continuous wheat production, that system is assumed to include some tillage operations.

## Other Wheat Production Management Resources

K-State Research and Extension has a number of resources available relating to wheat production and marketing. The Kansas *Wheat Production Handbook*, C-529, provides information on recommended wheat production practices. More information on wheat variety performance, insect, weed and disease management, market prospects, wheat residue and yield estimation, and other wheat production and marketing information can be obtained through K-State Research and Extension Offices or via the K-State Research and Extension Wheat website, www.oznet.ksu.edu/wheatpage/agronomy.htm.

### COST-RETURN PROJECTION — ROTATION WHEAT — NORTH CENTRAL KANSAS

| | Yield Level (bu) | | | Your |
|---|---|---|---|---|
| | 40 | 49 | 59 | Farm |
| INCOME PER ACRE | | | | |
| A. Yield per acre | 40 | 49 | 59 | |
| B. Price per bushel | $ 3.53 | $ 3.53 | $ 3.53 | |
| C. Net government payment | $ 13.01 | $ 14.14 | $ 15.27 | |
| D. Indemnity payments | $ 0.00 | $ 0.00 | $ 0.00 | |
| E. Miscellaneous income | $ 0.00 | $ 0.00 | $ 0.00 | |
| F. Returns/acre ((A × B) + C + D + E) | $ 154.21 | $ 187.11 | $ 223.54 | |
| COSTS PER ACRE | | | | |
| 1. Seed | $ 10.80 | $ 10.80 | $ 10.80 | |
| 2. Herbicide | 5.32 | 5.32 | 5.32 | |
| 3. Insecticide / Fungicide | | | | |
| 4. Fertilizer and Lime | 25.24 | 30.08 | 35.14 | |
| 5. Crop Consulting | | | | |
| 6. Crop Insurance | | | | |
| 7. Drying | | | | |
| 8. Miscellaneous | 6.25 | 6.25 | 6.25 | |
| 9. Custom Hire / Machinery Expense | 39.15 | 41.48 | 44.07 | |
| 10. Non-machinery Labor | 12.50 | 12.50 | 12.50 | |
| 11. Irrigation | | | | |
| a. Labor | | | | |
| b. Fuel and Oil | | | | |
| c. Repairs and Maintenance | | | | |
| d. Depreciation on Equipment and Well | | | | |
| e. Interest on Equipment | | | | |
| 12. Land Charge / Rent | 31.97 | 39.96 | 47.96 | |
| G. SUB TOTAL | $ 131.23 | $ 146.40 | $ 162.04 | |
| 13. Interest on 1/2 Nonland Costs | 3.97 | 4.26 | 4.56 | |
| H. TOTAL COSTS | $ 135.20 | $ 150.65 | $ 166.60 | |
| I. RETURNS OVER COSTS (F - H) | $ 19.01 | $ 36.46 | $ 56.94 | |
| J. TOTAL COSTS/BUSHEL (H ÷ A) | $ 3.38 | $ 3.07 | $ 2.82 | |
| K. RETURN TO ANNUAL COST (I + 13) ÷ G | 17.51% | 27.81% | 37.96% | |

## COST-RETURN PROJECTION — CONTINUOUS WHEAT — NORTH CENTRAL KANSAS

| | Yield Level (bu) | | | Your |
|---|---|---|---|---|
| | 36 | 45 | 53 | Farm |
| INCOME PER ACRE | | | | |
| A. Yield per acre | 36 | 45 | 53 | |
| B. Price per bushel | $ 3.53 | $ 3.53 | $ 3.53 | |
| C. Net government payment | $ 13.01 | $ 14.14 | $ 15.27 | |
| D. Indemnity payments | $ | $ | $ | |
| E. Miscellaneous income | $ | $ | $ | |
| F. Returns/acre ((A × B) + C + D + E) | $ 140.09 | $172.99 | $202.36 | |
| COSTS PER ACRE | | | | |
| 1. Seed | $ 9.00 | $ 9.00 | $ 9.00 | |
| 2. Herbicide | 5.32 | 5.32 | 5.32 | |
| 3. Insecticide / Fungicide | | | | |
| 4. Fertilizer and Lime | 18.26 | 21.40 | 24.41 | |
| 5. Crop Consulting | | | | |
| 6. Crop Insurance | | | | |
| 7. Drying | | | | |
| 8. Miscellaneous | 6.25 | 6.25 | 6.25 | |
| 9. Custom Hire / Machinery Expense | 56.59 | 58.93 | 61.00 | |
| 10. Non-machinery Labor | 12.50 | 12.50 | 12.50 | |
| 11. Irrigation | | | | |
| a. Labor | | | | |
| b. Fuel and Oil | | | | |
| c. Repairs and Maintenance | | | | |
| d. Depreciation on Equipment and Well | | | | |
| e. Interest on Equipment | | | | |
| 12. Land Charge / Rent | 31.97 | 39.96 | 47.96 | |
| G. SUB TOTAL | $ 139.90 | $153.36 | $166.44 | |
| 13. Interest on 1/2 Nonland Costs | 4.32 | 4.54 | 4.74 | |
| H. TOTAL COSTS | $ 144.21 | $157.90 | $171.17 | |
| I. RETURNS OVER COSTS (F - H) | $ –4.13 | $ 15.09 | $ 31.19 | |
| J. TOTAL COSTS/BUSHEL (H ÷ A) | $ 4.01 | $ 3.51 | $ 3.23 | |
| K. RETURN TO ANNUAL COST (I + 13) ÷ G | 0.14% | 12.80% | 21.59% | |

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