

## **AGRIBUSINESS MANAGEMENT CONTEST**

2008 Career Development Events in Agriculture  
Kansas State University, Manhattan, Kansas

### **PROBLEMS SECTION**

For the following problems, place your answer for each question in the corresponding numbered space on the answer card. Computations may be done in the margins or on the back of this paper, but not on the card. Each question is worth five (5) points. There is only one correct answer for each question.

#### **Problem I - BALANCE SHEET AND ANALYSIS**

Use the following beginning and ending Balance Sheet for Mr. Ernie A. Livven when answering questions 1 through 12.

Balance Sheet for Mr. Ernie A. Livven, Quick-N-Dirty Farms, Ruraltown, Kansas.

	12/31/06	12/31/07
<b><u>Assets</u></b>		
<b>Current Assets</b>		
Cash/Checking	\$ 11,304	\$ 23,361
Inventories		
Crops and Feed	\$ 86,184	\$ 152,241
Market Livestock	\$ 61,702	\$ 6,280
Supplies	\$ 6,656	\$ 9,506
Prepaid Expenses	<u>\$ 5,565</u>	<u>\$ 16,852</u>
<b>Total Current Assets</b>	\$171,411	\$ 208,240
<b>Non-Current Assets</b>		
Breeding Livestock	\$ 97,720	\$ 94,250
Machinery and Equipment	\$ 166,192	\$ 223,992
Buildings and Improvements	\$ 23,300	\$ 22,570
Land	<u>\$ 536,000</u>	<u>\$ 565,000</u>
<b>Total Non-Current Assets</b>	\$ 823,212	\$ 905,812
<b>Total Farm Assets</b>	\$ 994,623	\$ 1,114,052
<b><u>Liabilities</u></b>		
<b>Current Liabilities</b>		
Current Portion of Term Debt	\$ 27,381	\$ 34,205
Accounts Payable	\$ 2,046	\$ 0
Accrued Interest	\$ 3,285	\$ 4,496
Operating Loans Payable	\$ 58,900	\$ 45,305
Current Portion - Deferred Taxes	<u>\$ 15,204</u>	<u>\$ 17,605</u>
<b>Total Current Liabilities</b>	\$106,816	\$ 101,611
<b>Non-Current Liabilities</b>		
Breeding Livestock	\$ 8,884	\$ 6,079
Machinery	\$ 25,857	\$ 61,767
Farm Mortgage	\$145,250	\$ 122,564
Non-Current Portion-Deferred Taxes	<u>\$ 43,200</u>	<u>\$ 48,845</u>
<b>Total Non-Current Liabilities</b>	\$223,211	\$ 239,255
<b>Total Farm Liabilities</b>	\$330,027	\$ 340,866
<b>Net Worth or Equity</b>	\$664,596	\$ 773,186
<b>Total Liabilities and Net Worth</b>	\$994,623	\$ 1,114,052

Questions 1 through 12 refer to Mr. Livven's Balance Sheet shown on the previous page. Round ratios to two decimals.

1. With His balance sheet information, Mr. Livven can measure his:

- A. Liquidity and Solvency
- B. Profitability and Efficiency
- C. Rate of Return on Equity
- D. All of the above
- E. None of the above

2. What was Mr. Livven's Current Ratio on December 31, 2007?

- A. 1.60
- B. 1.82
- C. 2.05                       $\frac{CA}{CL} = \frac{208,240}{101,611} = 2.0493$
- D. 2.09
- E. 3.09

3. How much working capital did Mr. Livven have on December 31, 2006?

- A. \$ 53,291
- B. \$ 64,595              CA              171,411
- C. \$ 91,976              -CL              -106,816
- D. \$ 106,629              WC              64,595
- E. None of the above

4. What was Mr. Livven's Current Ratio on December 31, 2006?

- A. 1.60                       $\frac{CA}{CL} = \frac{171,411}{106,816} = 1.6047$
- B. 1.82
- C. 2.05
- D. 2.09
- E. 3.09

5. Consider the change in liquidity on Mr. Livven's operation between December 31, 2006 and December 31, 2007. Based on his balance sheet information, was his farm business:

- A. More liquid on December 31, 2006
  - B. More liquid on December 31, 2007
  - C. Less liquid on December 31, 2007
  - D. Both A and C
  - E. None of the above
- |    |             |             |
|----|-------------|-------------|
|    | <u>2006</u> | <u>2007</u> |
| CR | 1.60        | 2.05        |
| WC | 64,595      | 106,629     |

6. Based on the December 31, 2007 balance sheet for Mr. Livven, what percent of all debts (liabilities) as of 12/31/07 were scheduled to be paid during the year 2008?

- A. 9.12%
- B.** 29.81%  $\frac{TCL}{TL} = \frac{101,611}{340,866} \times 100 = 29.809\%$
- C. 30.60%
- D. 33.18%
- E. 42.47%

7. What was Mr. Livven's Debt-to-Asset Ratio on December 31, 2007?

- A. 26.41%
- B.** 30.60%  $\frac{TL}{TA} = \frac{340,866}{1,114,052} \times 100 = 30.596\%$
- C. 33.18%
- D. 48.80%
- E. 69.40%

8. What percent of Mr. Livven's assets were financed by debt on December 31, 2007?

- A. 26.41%
- B. 29.81%
- C.** 30.60%
- D. 33.18%
- E. 42.47%

9. Mr. Livven wants to know the change in solvency of his operation between December 31, 2006 and December 31, 2007. What measures will he need to determine the change in solvency?

- A. Debt-to-Asset Ratio and amount of Net Worth on December 31, 2007
- B. Debt-to-Asset Ratio and amount of Net Worth on December 31, 2006
- C. Current Ratio and Working Capital from both years 2006 2007
- D.** Both A and B DA 33.18% 30.60%
- E. None of the above NW 664,596 773,186

10. On December 31, 2007, Mr. Livven's Equity-to-Asset Ratio was?

- A. 30.60%  $\frac{NW}{TA} = \frac{773,186}{1,114,052} \times 100 = 69.403\%$
- B. 44.09%
- C. 64.90%
- D. 66.82%
- E.** 69.40%

11. What percent of Mr. Livven's assets were financed by equity on December 31, 2006?

- A. 33.18%       $\frac{664,596}{994,623} \times 100 = 66.818\%$
- B. 49.66%
- C. 68.62%
- D.** 66.82%
- E. 69.40%

12. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on December 31, 2007, Mr. Livven had sold all of his assets and paid off all of his debts, how much money would he have had left?

- A. \$664,596
- B. \$706,736
- C.** \$773,186
- D. \$839,636
- E. None of the above

## Problem II - INCOME STATEMENT AND ANALYSIS

Mr. Livven withdrew \$46,000 last year for family living expenses. Use this \$46,000 as the value of Mr. Livven's unpaid family and operator labor and management. Mr. Livven feels that he could earn a 7 percent return on his money in off-farm investments. Use this figure in calculating the opportunity cost of Mr. Livven's assets or equity. Use this information, the balance sheet on page 2, and the following Income Statement for Mr. Livven to answer questions 13 through 19.

### 2007 Income Statement for Mr. Ernie A. Livven, Quick-N-Dirty Farms, Ruraltown, Kansas

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<u>Revenues</u>		<u>Expenses</u>	
Crop Sales	\$ 178,147	Purchased Feed	\$ 15,640
Calf Sales	83,511	Seed	17,186
Cull Cows	3,470	Fertilizer	38,755
Custom work	5,930	Livestock Expenses	7,836
Crop Insurance	25,894	Gasoline, Fuel, and Oil	18,819
Government Payments	18,088	Hired Labor	9,543
Other	4,575	Repairs	24,582
		Chemicals	17,846
		Machine Hire	8,893
		Cash Rent	21,796
		Insurance	11,867
		Real Estate & Property Taxes	5,215
		Utilities	4,800
		Depreciation	23,760
		Interest	19,690
		Other	3,934
<b>Inventory Changes</b>		<b>Inventory Adjustments</b>	
Crops and Feed	\$ 16,057	Prepaid Expenses	\$ (11,287)
Livestock	(8,892)	Account Payable	(2,046)
Accounts Receivable	-		
<b>Total Gross Revenues</b>	<b>\$ 326,780</b>	<b>Total Expenses</b>	<b>\$ 236,829</b>
		<b>Net Farm Income from Operations</b>	<b>\$ 89,951</b>
		Gain/Loss on Sale of Capital Assets	\$ 3,200
		<b>Net Farm Income</b>	<b>\$ 93,151</b>

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13. What is Mr. Livven's 2007 net farm income (return to unpaid family and operator labor, equity capital, and management)?
- A. \$ 73,461  
 B. \$ 89,951  
C. \$ 93,151  
 D. \$112,841  
 E. None of the above
14. What is Mr. Livven's 2007 adjusted net farm income (return to unpaid family and operator labor, total capital, and management)?
- |           |                   |           |         |
|-----------|-------------------|-----------|---------|
| A.        | \$ 73,461         | NFI       | 93,151  |
| B.        | \$ 89,951         | +Interest | +19,690 |
| C.        | \$ 93,151         | Adj NFI   | 112,841 |
| <u>D.</u> | \$112,841         |           |         |
| E.        | None of the above |           |         |

**Two measures of profitability are the rate of return on assets (ROA) and the rate of return on equity (ROE). Definitions for ROA and ROE are:**

**ROA = (Net farm income from operations plus farm interest expense minus the value of unpaid family and operator labor and management) divided by average total farm assets. Multiply by 100 to express as a percentage.**

**ROE = (Net farm income from operations minus value of unpaid family and operator labor and management) divided by average farm equity. Multiple by 100 to express as a percentage.**

15. If the value of Mr. Livven's unpaid family and operator labor and management is \$46,000, what is Mr. Livven's ROA? ROUND PERCENTAGE TO TWO DECIMALS.
- |           |       |   |
|-----------|-------|---|
| A.        | 2.30% | ROA = NFI from Ops. + Interest  |
| B.        | 5.71% | - <u>unpaid Family &amp; Op. Labor</u> x 100                                    |
| <u>C.</u> | 6.04% | Ave TA  |
| D.        | 6.11% |   |
| E.        | 6.34% | $\frac{89,951 + 19,690 - 46,000}{(994,623 + 1,114,052)/2} \times 100 = 6.036\%$ |

16. If the value of Mr. Livven's unpaid family and operator labor and management is \$46,000, what is Mr. Livven's ROE? ROUND PERCENTAGE TO TWO DECIMALS.

- A. 6.34% ROE =  $\frac{\text{NFI from Ops.}}{\text{Ave NW}} \times 100$   
B. 6.11%  $\frac{89,951 - 46,000}{(664,596 + 773,186)/2} \times 100 = 6.113\%$   
 C. 6.04%  
 D. 5.71%  
 E. 2.30%

17. The two balance sheets on page 2 of this exam are market value balance sheets. This means that Mr. Livven's assets are valued at current market value on the date of the balance sheet. Assume the December 31, 2008 market value of all assets is exactly the same as the December 31, 2007 value. However, Mr. Livven's net farm income from operations in 2008 is \$10,000 more than his net farm income from operations in 2007. How will the \$10,000 increase in net farm income from operations affect Mr. Livven's rate of return on assets (ROA)?

- A. ROA will be smaller on December 31, 2008 than it was on December 31, 2007  
 B. ROA will be the same on December 31, 2008 as it was on December 31, 2007  
C. ROA will be larger on December 31, 2008 than it was on December 31, 2007  
 D. More information is needed to determine the direction of change in ROA  
 E. None of the above

**Mr. Livven is concerned about his operating profit margin. The Operating Profit and Operating Profit Margin Ratio are defined as:**

**Operating Profit = Net farm income from operations, plus interest expense, minus the opportunity cost of unpaid family and operator labor and management.**

**Operating Profit Margin Ratio = Operating Profit divided by total gross revenues. (Multiply by 100 to express as a percentage.)**

18. If the value of Mr. Livven's unpaid family and operator labor and management is \$46,000, what is the Operating Profit for Mr. Livven's operation?

- A. \$ 43,951 89,951  
 B. \$ 47,151 +19,690  
C. \$ 63,641 -46,000  
 D. \$109,641 63,641  
 E. None of the above



19. What is the Operating Profit Margin Ratio for Mr. Livven's operation in 2007?  
 ROUND PERCENTAGE TO TWO DECIMALS.

- A. 19.48%  $\frac{63,641}{326,780} \times 100 = 19.475\%$
- B. 27.53%
- C. 28.51%
- D. 33.55%
- E. None of the above

**Problem III – INVESTMENT ANALYSIS**

Use the following information to answer Questions 20 through 22.

Suppose you are considering two alternative investments that each have an initial investment cost of \$18,000 in year 0. Annual net cash flows received at the end of each of the next 5 years are as follows: The discount rate is 10%. Salvage value is zero.

Year	Net Cash Flow (Dollars)	
	Investment A	Investment B
1	5,000	7,000
2	5,000	7,000
3	5,000	5,000
4	5,000	3,000
5	5,000	3,000

You want to use the following information about the present value of \$1.00 with 10% interest compounded annually using the formula,  $Pv = 1/(1+r)^N$ .

Year	10%
1	0.9091
2	0.8264
3	0.7513
4	0.6830
5	0.6209

20. What is the net present value of Investment A?

A.	\$7,000						-\$18,000.00
B.	\$25,000	\$5,000	x	0.9091	=		\$4,545.50
C.	-\$953.50	\$5,000	x	0.8264	=		\$4,132.00
D.	\$0.00	\$5,000	x	0.7513	=		\$3,756.50
<b><u>E.</u></b>	\$ 953.50	\$5,000	x	0.6830	=		\$3,415.00
		\$5,000	x	0.6209	=		<u>\$3,104.50</u>
						NPV <sub>A</sub> =	\$953.50

21. What is the net present value of Investment B?

A.	\$7,000						-18,000.00
B.	\$25,000	\$7,000	x	.9091	=		\$6,363.70
<b><u>C.</u></b>	\$1,816.70	\$7,000	x	.8264	=		\$5,784.80
D.	-\$1,816.70	\$5,000	x	.7513	=		\$3,756.50
E.	\$ 0.00	\$3,000	x	.6830	=		\$2,049.00
		\$3,000	x	.6209	=		<u>\$1,862.70</u>
						NPV <sub>B</sub> =	\$1,816.70

22. If the goal is to maximize the present value of net cash flows, which investment is preferred?

- A. Investment A is preferred
- B.** Investment B is preferred
- C. The decision maker is indifferent between Investment A and Investment B
- D. All of the above
- E. None of the above

### Problem IV – CROP MARKETING

For questions 23 through 27, refer to the following information.

A wheat farmer sells 3 standard KCBOT wheat contracts in January. At harvest, the farmer offsets the hedge by buying the KCBOT wheat contracts and selling cash grain on July 1. Assume no commissions and zero interest cost on margins and premiums.

Date	Cash	Futures
January 15	\$8.50 (cash forward contract bid)	\$9.05 (sells 3 contracts)
July 1	\$7.50 (sells cash wheat)	\$8.15 (buys 3 contracts)

23. The farmer sold how many bushels of wheat on January 15 on the KCBOT?
- A. 333
  - B. 3,000
  - C. 5,000
  - D.** 15,000
  - E. 30,000
24. What is the wheat basis on January 15 at the farmer's local delivery location?
- A. \$0.55
  - B. \$8.50
  - C.** -\$0.55
  - D. \$9.05
  - E. None of the above
25. By July 1 when the hedge was offset, what happened to the wheat basis at the local delivery location?
- A. No change
  - B. Changed to -\$0.15/bu
  - C.** Weakened
  - D. Strengthened
  - E. None of the above.

26. What is the net result of the futures hedging portion of the marketing strategy?
- A. Break-even
  - B. \$1.00/bu loss
  - C. \$1.00/bu gain
  - D. \$0.90/bu loss
  - E.** \$0.90/bu gain
27. What is the net price the farmer received for the wheat on July 1 (again ignoring commission and interest)?
- A.** \$8.40/bu
  - B. \$8.50/bu
  - C. \$7.50/bu
  - D. \$8.15/bu
  - E. \$9.05/bu

### Problem V - LIVESTOCK MARKETING

For questions 28 through 33, refer to the following information. In March, a Kansas cattle producer buys a June CME Live Cattle Put Option with a \$100.00/cwt strike price for a \$1.25/cwt premium. Assume the producer's local basis when the cattle are sold is -\$0.50/cwt. Assume no commissions and zero interest cost on margins and premiums.

28. What is the producer's expected minimum price he will receive for the cattle?
- A. \$100.00
  - B.** \$98.25
  - C. \$98.75
  - D. \$99.50
  - E. None of the above
29. Assume the June Live Cattle Contract was trading at \$98.50 when the cattle were sold, and that actual local basis was -\$0.25/cwt. What is the net price received for the cattle?
- A. \$99.50
  - B. \$98.75
  - C. \$99.75
  - D.** \$98.50
  - E. \$100.00
30. Assume the June Live Cattle Contract was trading at \$100.50/cwt when the Put Option was purchased. The Put Option is best described as
- A. At-the-money
  - B. In-the-money
  - C.** Out-of-the-money
  - D. Worthless
  - E. None of the above
31. If the underlying futures contract is trading at \$100.50, and the \$100.00 put option strike price is \$1.25, then \$0.50 of the strike price is \_\_\_\_\_ and \$0.75 is \_\_\_\_\_.
- A. Time value and intrinsic value
  - B. Residual value and maturity value
  - C. Speculative value and hedging value
  - D.** Intrinsic value and time value
  - E. None of the above

32. Assume the June Live Cattle Futures Contract is at \$97.00/cwt when the producer's option expires. What would the Put Option be worth?
- A. \$ 0.00/cwt
  - B. \$ 2.00/cwt
  - C.** \$ 3.00/cwt
  - D. \$97.00/cwt
  - E. \$95.75/cwt
33. Using a put option rather than selling a futures contract as a marketing strategy--
- A. Left the upside market potential open
  - B. Assured there would be no additional margin calls
  - C. Locked in a known "cost" of the risk management strategy
  - D.** All of the above
  - E. None of the above

### **Problem VI – ENTERPRISE BUDGETING**

Attached at the end of the exam is a four-page Farm Management Guide entitled, "Wheat Cost-Return Budget in North Central Kansas" that was prepared by Daniel M. Obrien, Stewart R. Duncan, and Brian L.S. Olson, Kansas State University, October 2007. The budget used projected 2008 input and output prices for illustrative purposes, prepared in the Fall of 2007. Budgets for two alternative production systems, each assuming three different yield potentials, are shown on pages 17 and 18. Explanatory information regarding the preparation of the example budgets is included in the text and tables on pages 15 and 16. Use the information in the guide as necessary to answer questions 34 through 40, though most of the questions can be answered without reference to this specific guide.

34. Gross Income per acre is impacted by...
- A. The price of fertilizer
  - B. Wheat prices only
  - C. Yields only
  - D.** Yields, wheat prices, and government payments
  - E. None of the above

35. One would expect a “no-till” crop budget to have higher \_\_\_\_\_ costs, and lower \_\_\_\_\_ costs.
- A. Fertilizer - Herbicide
  - B. Herbicide - Fertilizer
  - C. Machinery - Herbicide
  - D.** Herbicide - Machinery
  - E. None of the above
36. Which of the following could be non-cash expenses for a wheat enterprise?
- A. Depreciation on facilities and equipment
  - B. Labor expense
  - C. Land rent
  - D.** All of the above
  - E. None of the above
37. If you have no money borrowed, you should ...
- A. Zero out the interest charge lines because they are not relevant for your operation
  - B.** Include a value in the interest charge lines because they represent opportunity cost
  - C. Borrow money at the bank so you will have an interest charge
  - D. Feel good because you will always be more profitable than someone who pays interest
  - E. None of the above.
38. The land charge (line 12) increases for the higher assumed yield levels because:
- A.** Higher yield goals are associated with higher quality land, which has a higher rental value
  - B. If you pay more for the land you are guaranteed a higher yield
  - C. If you get higher yields you will go to the landlord and pay them more rent
  - D. That is the way it should be for rented land, but it would be different for owned land
  - E. None of the above

39. Assuming you own and operate your entire machinery line and do not hire any custom operations done, how will line (9) (custom hire/machinery expense) change on your budget?
- A. You would include only cash expenses such as fuel, since everything else is paid for.
  - B.** You would include all of your own machinery operation and ownership expenses.
  - C. You would include only ownership costs such as depreciation, taxes, and insurance.
  - D. You would use the lower value of either your actual operation and ownership costs, or custom rates
  - E. None of the above
40. Assumptions regarding inputs (fertilizer, seed, etc.) use levels for the wheat budgets are based upon:
- A. Recommendations for maximum yields for various soil types
  - B. Historical average recommendations for the area
  - C.** Recommendations that attempt to set input usage levels such that the marginal value product equals the per unit cost of the various inputs
  - D. Best guesses
  - E. None of the above



# Wheat Cost-Return Budget in North Central Kansas

Department of Agricultural Economics — [www.agmanager.info](http://www.agmanager.info)



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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.

## Income Per Acre

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budgets include

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

Item	Yield Level (bu)			
	45	57	70	
Seed, lbs	120	120	120	\$0.13/lb
Fertilizer:				
N (anhydrous)	0	0	0	\$0.29/lb
N	77	99	122	\$0.50/lb
P	25	32	39	\$0.39/lb
K	0	0	0	\$0.23/lb
Lime	500	500	500	\$0.01/lb
Herbicide				
Finesse	0.3	0.3	0.3	\$14.18/oz
+ Surfactant	1.0	1.0	1.0	\$1.00/a
Insecticide / Fungicide				

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

Item	Yield Level (bu)			
	40	52	65	
Seed, lbs	90	90	90	\$0.13/lb
Fertilizer:				
N (anhydrous)	63	82	103	\$0.29/lb
N	6	9	11	\$0.50/lb
P	23	29	37	\$0.39/lb
K	0	0	0	\$0.23/lb
Lime	500	500	500	\$0.01/lb
Herbicide				
Finesse	0.3	0.3	0.3	\$14.18/oz
+ Surfactant	1.0	1.0	1.0	\$1.00/a
Insecticide / Fungicide				
Tilt	0.0	4.0	4.0	\$3.00/oz

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, 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 accommo-

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

Item	Yield Level (bu)			Custom Rate
	45	57	70	
<b>Tillage/Planting/Chemical Applications:</b>				
Chisel	0	0	0	\$9.21/a
Disk	0	0	0	\$7.88/a
Field cultivate	0	0	0	\$7.46/a
No-till drill	1	1	1	\$11.91/a
Anhydrous application	0	0	0	\$6.83/a
Fertilizer application	1	1	1	\$4.20/a
Herbicide application	1	1	1	\$4.45/a
Insecticide / fungicide application	0	0	0	\$4.56/a
<b>Harvest</b>				
Base charge	1	1	1	\$15.97/a
Extra charge for yields exceeding	21	21	21	\$0.151/bu
Hauling	45	57	70	\$0.147/bu
Non-machinery labor	0.53	0.57	0.61	\$10.00/hr
Land charge/rent	\$42.40	\$53.00	\$63.60	
Interest on capital				8.5%

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

Item	Yield Level (bu)			Custom Rate
	40	52	65	
<b>Tillage/Planting/Chemical Applications:</b>				
Chisel	1	1	1	\$9.21/a
Disk	1	1	1	\$7.88/a
Field cultivate	1	1	1	\$7.46/a
Drill	1	1	1	\$8.62/a
Anhydrous application	1	1	1	\$6.83/a
Fertilizer application	0	0	0	\$4.20/a
Herbicide application	1	1	1	\$4.45/a
Insecticide / fungicide application	0	1	1	\$4.56/a
<b>Harvest</b>				
Base charge	1	1	1	\$15.97/a
Extra charge for yields exceeding	21	21	21	\$0.151/bu
Hauling	40	52	65	\$0.147/bu
Non-machinery labor	0.78	0.87	0.92	\$10.00/hr
Land charge/rent	\$42.40	\$53.00	\$63.60	
Interest on capital				8.5%

date 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](http://www.oznet.ksu.edu/wheatpage/agronomy.htm).

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

	Yield Level (bu)			Your Farm
	45	57	70	
<b>INCOME PER ACRE</b>				
A. Yield per acre .....	45	57	70	
B. Price per bushel.....	\$ 5.55	\$ 5.55	\$ 5.55	
C. Net government payment.....	\$ 13.03	\$ 14.16	\$ 15.29	
D. Indemnity payments.....	\$	\$	\$	
E. Miscellaneous income .....	\$	\$	\$	
F. Returns/acre ((A × B) + C + D + E) .....	\$ 262.78	\$ 330.51	\$ 403.79	
<b>COSTS PER ACRE</b>				
1. Seed.....	\$ 15.60	\$ 15.60	\$ 15.60	
2. Herbicide.....	5.25	5.25	5.25	
3. Insecticide / Fungicide .....				
4. Fertilizer and Lime.....	53.13	66.82	81.02	
5. Crop Consulting .....				
6. Crop Insurance .....				
7. Drying .....				
8. Miscellaneous .....	6.25	6.25	6.25	
9. Custom Hire / Machinery Expense .....	46.77	50.35	54.22	
10. Non-machinery Labor .....	5.28	5.69	6.13	
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 .....	42.40	53.00	63.60	
G.SUB TOTAL .....	\$ 174.68	\$ 202.96	\$ 232.06	
13. Interest on ½ Nonland Costs.....	5.62	6.37	7.16	
H. TOTAL COSTS .....	\$ 180.30	\$ 209.33	\$ 239.22	
I. RETURNS OVER COSTS (F - H).....	\$ 82.47	\$ 121.18	\$ 164.57	
J. TOTAL COSTS/BUSHEL (H ÷ A) .....	\$ 4.01	\$ 3.67	\$ 3.42	
K. RETURN TO ANNUAL COST (I + 13) ÷ G .....	50.43%	62.85%	74.00%	

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

	Yield Level (bu)			Your Farm
	40	52	65	
<b>INCOME PER ACRE</b>				
A. Yield per acre .....	40	52	65	_____
B. Price per bushel.....	\$ 5.55	\$ 5.55	\$ 5.55	_____
C. Net government payment.....	\$ 13.03	\$ 14.16	\$ 15.29	_____
D. Indemnity payments.....	\$ _____	\$ _____	\$ _____	_____
E. Miscellaneous income .....	\$ _____	\$ _____	\$ _____	_____
F. Returns/acre ((A × B) + C + D + E) .....	\$ 235.03	\$ 302.76	\$ 376.04	_____
<b>COSTS PER ACRE</b>				
1. Seed.....	\$ 11.70	\$ 11.70	\$ 11.70	_____
2. Herbicide.....	5.25	5.25	5.25	_____
3. Insecticide / Fungicide .....	0.00	12.00	12.00	_____
4. Fertilizer and Lime.....	35.13	44.45	54.62	_____
5. Crop Consulting .....	_____	_____	_____	_____
6. Crop Insurance .....	_____	_____	_____	_____
7. Drying .....	_____	_____	_____	_____
8. Miscellaneous .....	6.25	6.25	6.25	_____
9. Custom Hire / Machinery Expense .....	69.17	77.31	81.18	_____
10. Non-machinery Labor .....	7.82	8.74	9.17	_____
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 .....	42.40	53.00	63.60	_____
G.SUB TOTAL .....	\$ 177.71	\$ 218.69	\$ 243.77	_____
13. Interest on ½ Nonland Costs.....	5.75	7.04	7.66	_____
H. TOTAL COSTS .....	\$ 183.46	\$ 225.73	\$ 251.43	_____
I. RETURNS OVER COSTS (F - H).....	\$ 51.56	\$ 77.03	\$ 124.61	_____
J. TOTAL COSTS/BUSHEL (H ÷ A) .....	\$ 4.59	\$ 4.34	\$ 3.87	_____
K. RETURN TO ANNUAL COST (I + 13) ÷ G.....	32.25%	38.44%	54.26%	_____

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