Ag Profitability Conference

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Impact of Rising Fuel and Fertilizer Prices

Kevin C. Dhuyvetter -- kcd@ksu.edu -- 785-532-3527
Terry L. Kastens -- tkastens@ksu.edu -- 785-532-5866

Department Agricultural Economics
Kansas State University
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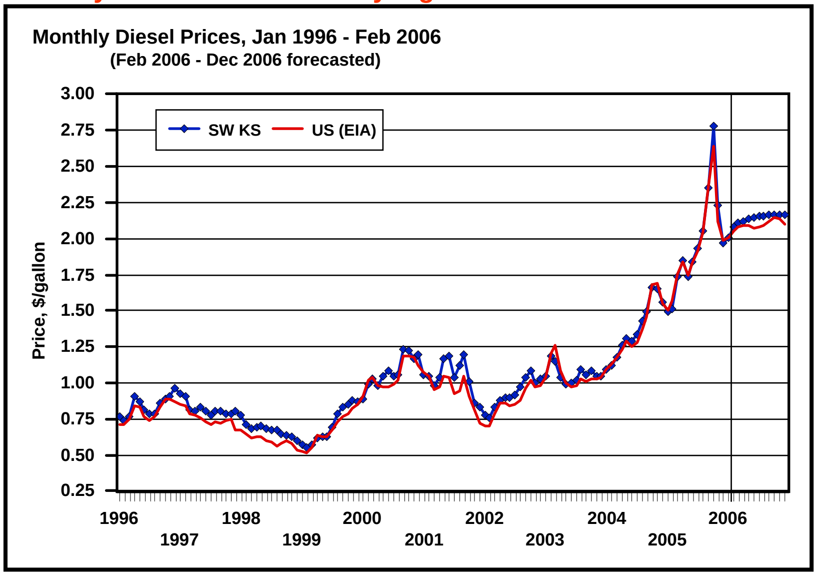
Background thoughts . . .

- Prices for energy-related inputs are at extremely high levels (all-time highs in many cases)
- Producers likely cannot do much about the prices they face, but they need to “understand the numbers” to make good decisions
- Major decisions crop producers have pertain to input levels, crop selection, tillage method, and possibly negotiating leases on rented land

Historical and forecasted prices for energy-related inputs

(diesel fuel, fertilizer, natural gas)

Diesel prices are forecasted to be below 2005 peak level, but they are still at historically high levels …



Based on 1/31/06 futures closing prices

Historical and forecasted diesel prices during principal farming months…

Diesel Fuel Prices

Year	Mar-Oct Diesel Price SW KS	US (EIA)	Average	Year-to-year percent change SW KS	US (EIA)	Average
2000	$1.09	$1.04	$1.07	-----	-----	-----
2001	$1.09	$0.98	$1.04	0.6%	-6.1%	-2.7%
2002	$0.94	$0.88	$0.91	-14.1%	-10.0%	-12.1%
2003	$1.05	$1.05	$1.05	12.1%	18.6%	15.3%
2004	$1.37	$1.34	$1.36	30.0%	28.4%	29.2%
2005	$2.04	$2.02	$2.03	48.5%	49.9%	49.2%
2006 (F)	$2.14	$2.10	$2.12	5.3%	4.1%	4.7%
2006 - 2005	$0.11	$0.08	$0.10	5.3%	4.1%	4.7%
06 - Avg(00-04)	$1.03	$1.04	$1.04	93.3%	97.9%	95.5%

F = forecast

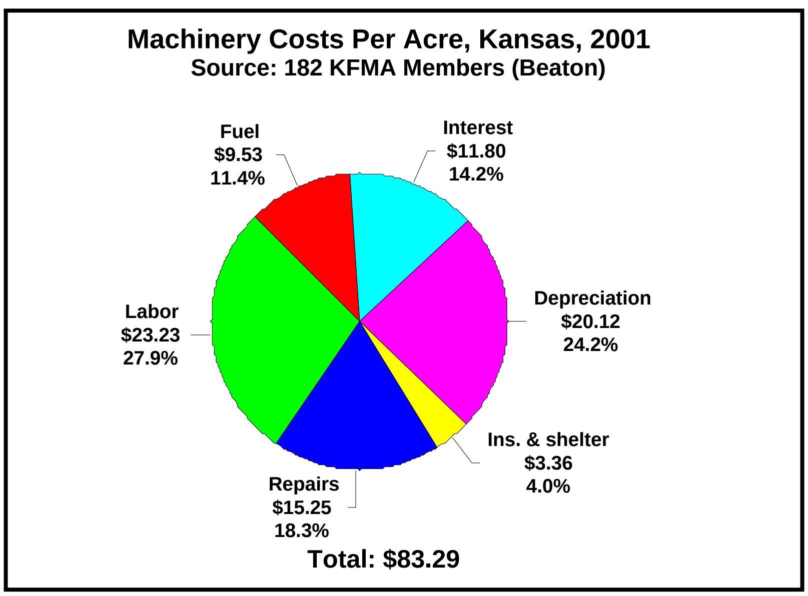
Effect diesel price has on machinery costs per acre based on fuel consumption…

Fuel Consumption and Diesel Price Impact for Various Field Operations

	Fuel use	Fuel price increase, $/gallon				
Operation	gallons/acre	$0.05	$0.10	$0.15	$0.25	$0.50
		Increase in operation cost, $/acre				
Chisel plow	0.64	$0.03	$0.06	$0.10	$0.16	$0.32
Field cultivator	0.34	$0.02	$0.03	$0.05	$0.09	$0.17
Tandem disk	0.49	$0.02	$0.05	$0.07	$0.12	$0.25
Min-till planter	0.53	$0.03	$0.05	$0.08	$0.13	$0.27
No-till drill	0.81	$0.04	$0.08	$0.12	$0.20	$0.41
Sprayer	0.11	$0.01	$0.01	$0.02	$0.03	$0.06
Swather-conditioner	0.42	$0.02	$0.04	$0.06	$0.11	$0.21
Round baler	0.77	$0.04	$0.07	$0.12	$0.19	$0.39
Combine--wheat	1.31	$0.07	$0.12	$0.20	$0.33	$0.66
Combine--soybeans	2.02	$0.10	$0.19	$0.30	$0.51	$1.01
Combine--corn	1.93	$0.10	$0.18	$0.29	$0.48	$0.97

Source: Lazarus and Selley (abbreviated version)

Fuel prices are extremely high, but fuel costs represent one of the smaller cost categories…



Estimated effect diesel price has on machinery costs per acre based on custom rates…

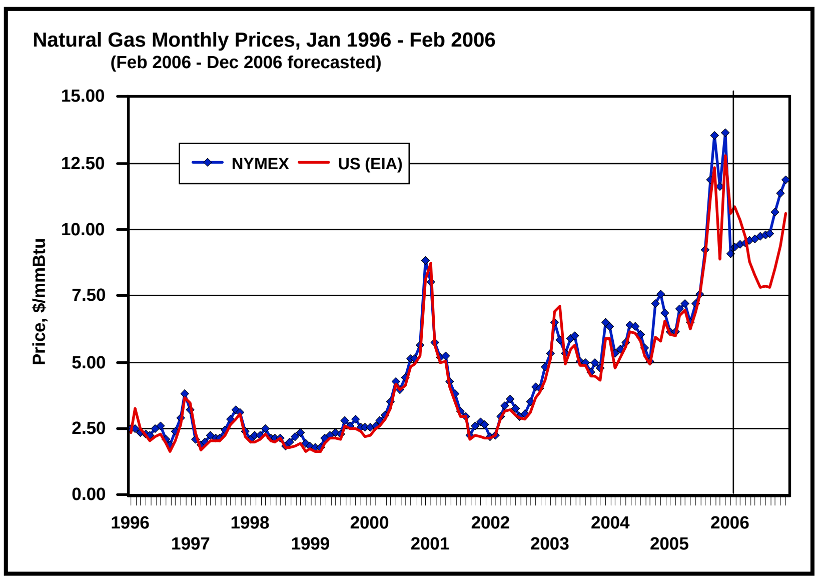
Diesel Price Impact on Custom Rates for Various Field Operations

Operation	Custom rate*	$0.05	$0.10	$0.15	$0.25	$0.50
		Fuel price increase, $/gallon				
		Increase in custom rate, $/acre				
Chiseling	$8.45	$0.04	$0.08	$0.12	$0.20	$0.40
Field cultivation	$7.13	$0.03	$0.06	$0.10	$0.17	$0.34
Disking	$6.84	$0.03	$0.06	$0.10	$0.16	$0.32
Min-till planter	$10.94	$0.05	$0.10	$0.16	$0.26	$0.52
No-till drill	$11.45	$0.05	$0.10	$0.16	$0.27	$0.54
Sprayer	$4.26	$0.02	$0.04	$0.06	$0.10	$0.20
Swather-conditioner	$9.46	$0.04	$0.09	$0.13	$0.22	$0.45
Round baler	$8.24	$0.04	$0.07	$0.12	$0.20	$0.39
Combine--wheat	$15.24	$0.07	$0.14	$0.22	$0.36	$0.72
Combine--soybeans	$21.48	$0.10	$0.19	$0.31	$0.51	$1.02
Combine--corn	$21.68	$0.10	$0.20	$0.31	$0.51	$1.03

* 2005 state average reported by Kansas Agricultural Statistics

Increase in 2005 custom rates		0.5%	0.9%	1.4%	2.4%	4.7%

Natural gas prices remain at historically high levels…



Based on 1/31/06 futures closing prices

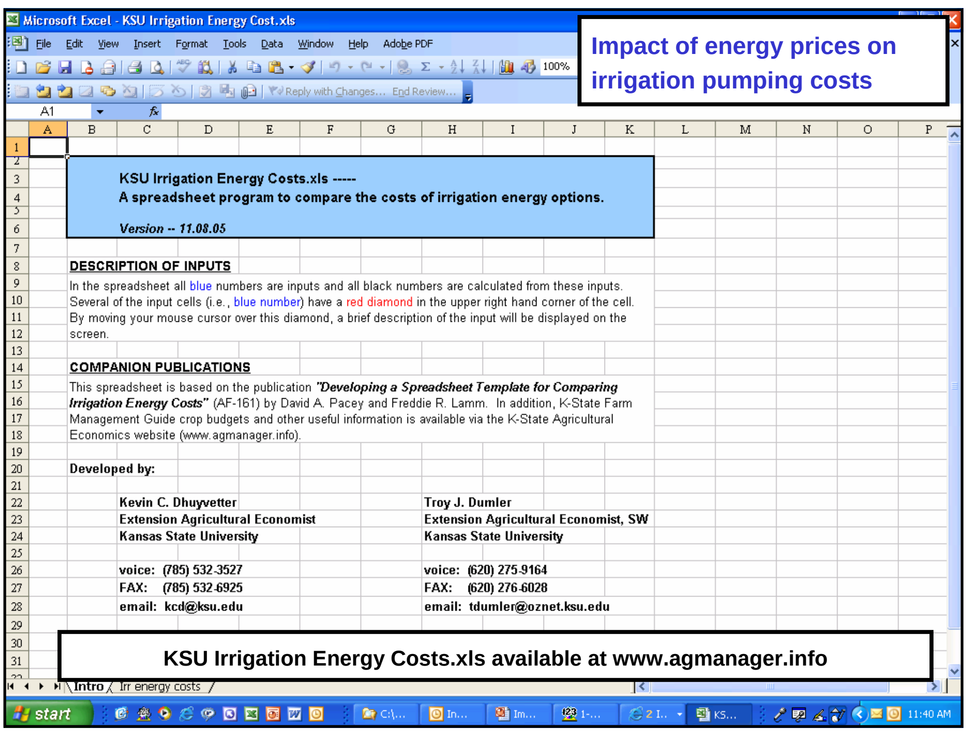
Historical and forecasted natural gas prices during principal farming months…

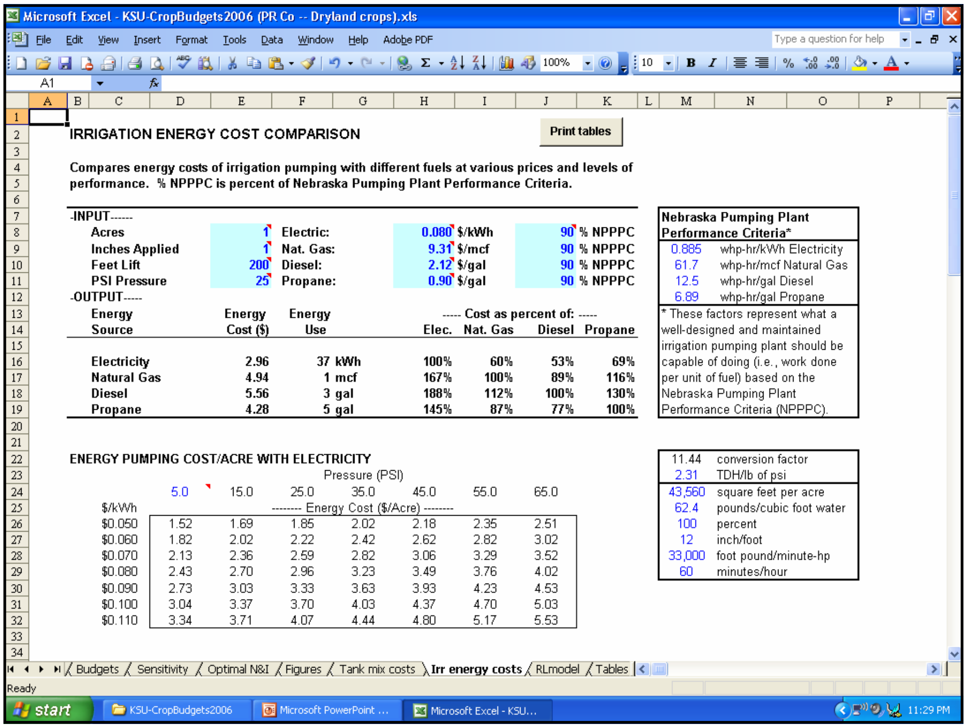
Natural Gas Prices

	Mar-Sep Natural Gas Price			Year-to-year percent change		
Year	NYMEX	US (EIA)	Average	NYMEX	US (EIA)	Average
2000	$3.89	$3.85	$3.87	-----	-----	-----
2001	$3.85	$3.49	$3.67	-1.0%	-9.3%	-5.1%
2002	$3.25	$3.12	$3.18	-15.5%	-10.7%	-13.2%
2003	$5.40	$5.24	$5.32	66.0%	68.2%	67.1%
2004	$5.81	$5.63	$5.72	7.6%	7.5%	7.5%
2005	$8.09	$8.37	$8.23	39.2%	48.6%	43.9%
2006 (F)	$9.96	$8.65	$9.31	23.2%	3.3%	13.1%
2006 - 2005	$1.87	$0.28	$1.08	23.2%	3.3%	13.1%
06 - Avg(00-04)	$5.52	$4.39	$4.95	124.4%	102.9%	113.9%

F = forecast

Based on 1/31/06 futures closing prices





Microsoft Excel - KSU-CropBudgets2006 (PR Co -- Dryland crops).xls

IRRIGATION ENERGY COST COMPARISON

Print tables

Compares energy costs of irrigation pumping with different fuels at various prices and levels of performance. % NPPPC is percent of Nebraska Pumping Plant Performance Criteria.

-INPUT------

Acres	1	Electric:	0.080 $/kWh	90	% NPPPC
Inches Applied	1	Nat. Gas:	9.31 $/mcf	90	% NPPPC
Feet Lift	200	Diesel:	2.12 $/gal	90	% NPPPC
PSI Pressure	25	Propane:	0.90 $/gal	90	% NPPPC

-OUTPUT-----

Energy Source	Energy Cost ($)	Energy Use	Elec.	Nat. Gas	Diesel	Propane
			----- Cost as percent of: -----			
Electricity	2.96	37 kWh	100%	60%	53%	69%
Natural Gas	4.94	1 mcf	167%	100%	89%	116%
Diesel	5.56	3 gal	188%	112%	100%	130%
Propane	4.28	5 gal	145%	87%	77%	100%

Nebraska Pumping Plant Performance Criteria*

0.885	whp-hr/kWh Electricity
61.7	whp-hr/mcf Natural Gas
12.5	whp-hr/gal Diesel
6.89	whp-hr/gal Propane

* These factors represent what a well-designed and maintained irrigation pumping plant should be capable of doing (i.e., work done per unit of fuel) based on the Nebraska Pumping Plant Performance Criteria (NPPPC).

ENERGY PUMPING COST/ACRE WITH ELECTRICITY

$/kWh	5.0	15.0	25.0	35.0	45.0	55.0	65.0
	Pressure (PSI)						
	-------- Energy Cost ($/Acre) --------						
$0.050	1.52	1.69	1.85	2.02	2.18	2.35	2.51
$0.060	1.82	2.02	2.22	2.42	2.62	2.82	3.02
$0.070	2.13	2.36	2.59	2.82	3.06	3.29	3.52
$0.080	2.43	2.70	2.96	3.23	3.49	3.76	4.02
$0.090	2.73	3.03	3.33	3.63	3.93	4.23	4.53
$0.100	3.04	3.37	3.70	4.03	4.37	4.70	5.03
$0.110	3.34	3.71	4.07	4.44	4.80	5.17	5.53

11.44	conversion factor
2.31	TDH/lb of psi
43,560	square feet per acre
62.4	pounds/cubic foot water
100	percent
12	inch/foot
33,000	foot pound/minute-hp
60	minutes/hour

Budgets / Sensitivity / Optimal N&I / Figures / Tank mix costs / Irr energy costs / RLmodel / Tables

Irrigation pumping costs versus energy prices and lift…

ENERGY PUMPING COST/ACRE WITH NATURAL GAS

$/mcf	50	100	150	200	250	300	350
				Feet Lift			
			-------- Energy Cost ($/Acre-Inch) --------				
$5.00	1.23	1.74	2.26	2.77	3.29	3.80	4.32
$5.50	1.35	1.92	2.48	3.05	3.62	4.18	4.75
$6.00	1.47	2.09	2.71	3.33	3.95	4.56	5.18
$6.50	1.60	2.27	2.94	3.61	4.28	4.95	5.61
$7.00	1.72	2.44	3.16	3.88	4.60	5.33	6.05
$7.50	1.84	2.62	3.39	4.16	4.93	5.71	6.48
$8.00	1.97	2.79	3.61	4.44	5.26	6.09	6.91
$8.50	2.09	2.96	3.84	4.72	5.59	6.47	7.34
$9.00	2.21	3.14	4.07	4.99	5.92	6.85	7.77
$9.50	2.33	3.31	4.29	5.27	6.25	7.23	8.21
$10.00	2.46	3.49	4.52	5.55	6.58	7.61	8.64
$4.36	1.07	1.52	1.97	2.42	2.87	3.32	3.77
$9.31	2.29	3.25	4.21	5.17	6.12	7.08	8.04

Based on pressure of 30 psi

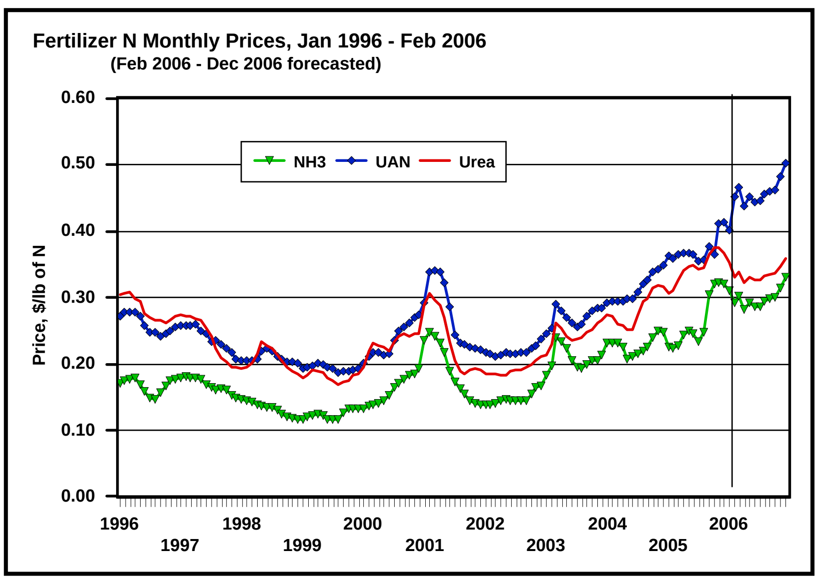
Irrigation pumping costs versus energy prices and lift…

ENERGY PUMPING COST/ACRE WITH DIESEL FUEL

	Feet Lift						
	50	100	150	200	250	300	350
$/gallon	-------- Energy Cost ($/Acre-Inch) --------						
$0.50	0.61	0.86	1.12	1.37	1.62	1.88	2.13
$0.75	0.91	1.29	1.67	2.05	2.44	2.82	3.20
$1.00	1.21	1.72	2.23	2.74	3.25	3.76	4.26
$1.25	1.52	2.15	2.79	3.42	4.06	4.69	5.33
$1.50	1.82	2.58	3.35	4.11	4.87	5.63	6.40
$1.75	2.12	3.01	3.90	4.79	5.68	6.57	7.46
$2.00	2.43	3.44	4.46	5.48	6.49	7.51	8.53
$2.25	2.73	3.87	5.02	6.16	7.31	8.45	9.59
$2.50	3.03	4.30	5.58	6.85	8.12	9.39	10.66
$2.75	3.34	4.73	6.13	7.53	8.93	10.33	11.73
$3.00	3.64	5.16	6.69	8.22	9.74	11.27	12.79
$1.08	1.31	1.86	2.41	2.96	3.51	4.06	4.60
$2.12	2.57	3.65	4.73	5.81	6.88	7.96	9.04

Based on pressure of 30 psi

Nitrogen fertilizer prices are at historically high levels…



Based on 1/31/06 futures closing prices

Historical and forecasted fertilizer prices during principal fertilizing months…

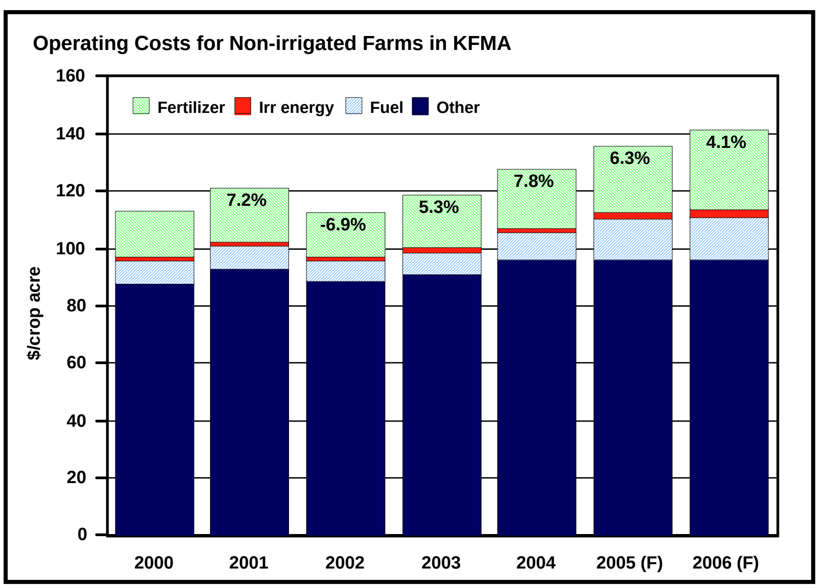
Fertilizer Prices (Corn Belt)

Percent of total	40.0%	17.5%	17.5%	20.0%	5.0%	100.0%	
			Oct-May Fertilizer Price*				Yr-to-yr
Year	NH3 (82%)	UAN (32%)	Urea (46%)	- P -	- K -	Wtd Avg	% change
2000	0.136	0.204	0.205	0.211	0.148	0.175	-----
2001	0.217	0.305	0.272	0.193	0.148	0.234	33.2%
2002	0.141	0.218	0.187	0.201	0.144	0.175	-25.3%
2003	0.195	0.253	0.227	0.209	0.141	0.211	20.7%
2004	0.218	0.290	0.262	0.214	0.141	0.234	10.8%
2005	0.238	0.356	0.322	0.223	0.174	0.267	14.4%
2006 (F)	0.305	0.425	0.349	0.234	0.199	0.314	17.5%
2006 - 2005	$0.067	$0.068	$0.027	$0.012	$0.025	$0.047	17.5%
Percent chg	28.0%	19.2%	8.2%	5.2%	14.3%	17.5%	
06 - Avg(00-04)	$0.123	$0.171	$0.118	$0.029	$0.054	$0.108	52.7%
Percent chg	67.9%	67.3%	51.2%	14.0%	37.5%	52.7%	

* Oct-Dec of previous year (P = average of 10-34-0 and 18-46-0, K = muriate of potash)

F = forecast

Costs per acre will be up in 2006 for fourth straight year…



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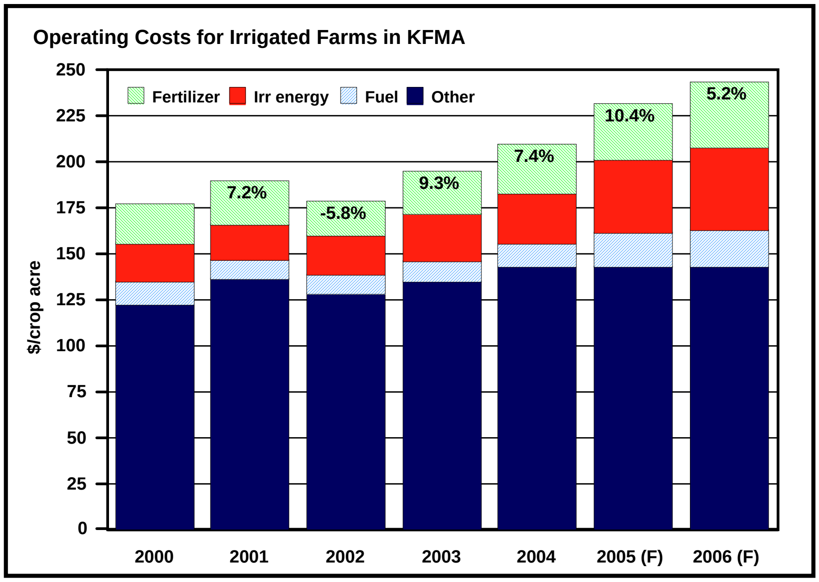
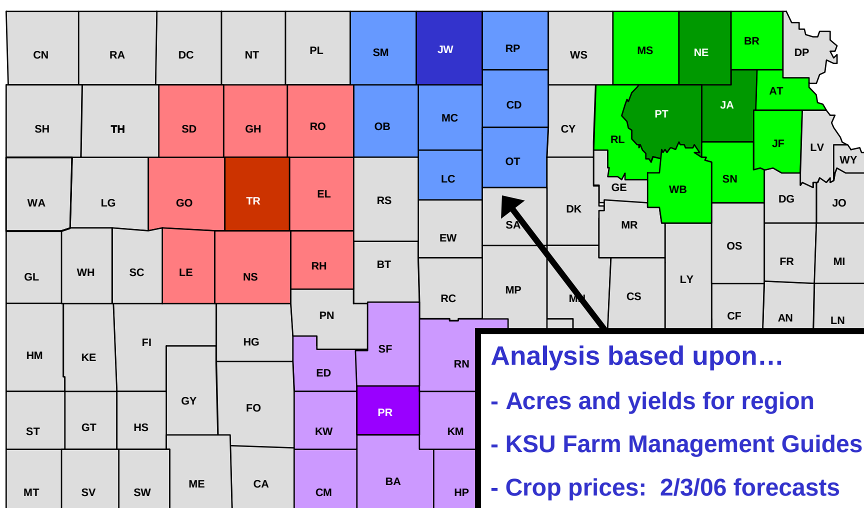


Analysis of Crop Profitability



Analysis based upon…

- Acres and yields for region
- KSU Farm Management Guides
- Crop prices: 2/3/06 forecasts
- Energy prices: 1/31/06 forecasts
- *CropBudgets2006.xls*

Projected budgets…

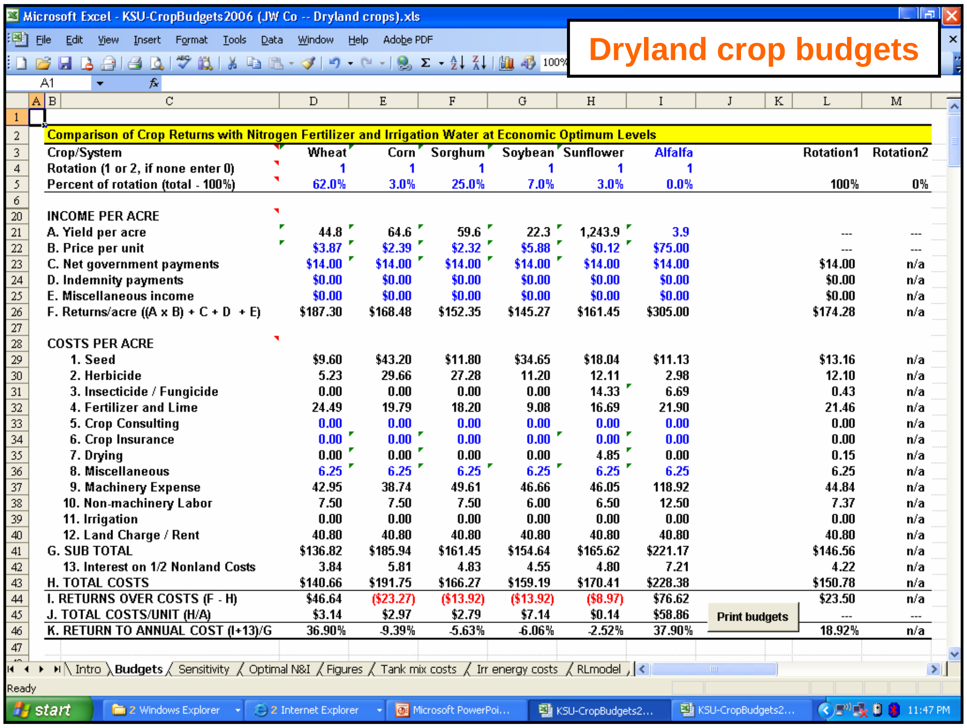
- Crop rotations:
  - -- Dryland: wheat (73%), corn (7%), milo (17.5%), SF (2.5%)
  - -- Irrigated: corn (50%), milo (7%), soybeans (43%)
- Machinery costs: 2000-04 vs. 2006-fuel-adjusted-rate
- Natural gas: 2000-04 avg vs. projected 2006 value
- Fertilizer: 2000-04 avg vs. projected 2006 values
- Inputs based on KSU Farm Management Guides except N fertilizer and irrigation ➔ optimal levels

Focus should be on changes and relative differences rather than absolute values

Cost scenarios…

Input	Average Prices	Current Prices
Machinery	2000-04 time-adjusted custom rates	2000-04 time-adjusted rates x 110%
Fertilizer	2000-04 avg	2006 forecast
N	$0.206/lb	$0.338/lb (+64%)
P	$0.205/lb	$0.234/lb (+14%)
K	$0.145/lb	$0.199/lb (+37%)
Irrigation	2000-04 avg $1.97/inch	2006 forecast $4.21/inch (+114%)

Dryland crop budgets



Microsoft Excel - KSU-CropBudgets2006 (JW Co -- Dryland crops).xls

Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels								
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower	Alfalfa	Rotation1	Rotation2
Rotation (1 or 2, if none enter 0)	1	1	1	1	1	1		
Percent of rotation (total - 100%)	62.0%	3.0%	25.0%	7.0%	3.0%	0.0%	100%	0%
INCOME PER ACRE								
A. Yield per acre	44.8	64.6	59.6	22.3	1,243.9	3.9	---	---
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12	$75.00	---	---
C. Net government payments	$14.00	$14.00	$14.00	$14.00	$14.00	$14.00	$14.00	n/a
D. Indemnity payments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	n/a
E. Miscellaneous income	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	n/a
F. Returns/acre ((A x B) + C + D + E)	$187.30	$168.48	$152.35	$145.27	$161.45	$305.00	$174.28	n/a
COSTS PER ACRE								
1. Seed	$9.60	$43.20	$11.80	$34.65	$18.04	$11.13	$13.16	n/a
2. Herbicide	5.23	29.66	27.28	11.20	12.11	2.98	12.10	n/a
3. Insecticide / Fungicide	0.00	0.00	0.00	0.00	14.33	6.69	0.43	n/a
4. Fertilizer and Lime	24.49	19.79	18.20	9.08	16.69	21.90	21.46	n/a
5. Crop Consulting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
6. Crop Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
7. Drying	0.00	0.00	0.00	0.00	4.85	0.00	0.15	n/a
8. Miscellaneous	6.25	6.25	6.25	6.25	6.25	6.25	6.25	n/a
9. Machinery Expense	42.95	38.74	49.61	46.66	46.05	118.92	44.84	n/a
10. Non-machinery Labor	7.50	7.50	7.50	6.00	6.50	12.50	7.37	n/a
11. Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
12. Land Charge / Rent	40.80	40.80	40.80	40.80	40.80	40.80	40.80	n/a
G. SUB TOTAL	$136.82	$185.94	$161.45	$154.64	$165.62	$221.17	$146.56	n/a
13. Interest on 1/2 Nonland Costs	3.84	5.81	4.83	4.55	4.80	7.21	4.22	n/a
H. TOTAL COSTS	$140.66	$191.75	$166.27	$159.19	$170.41	$228.38	$150.78	n/a
I. RETURNS OVER COSTS (F - H)	$46.64	($23.27)	($13.92)	($13.92)	($8.97)	$76.62	$23.50	n/a
J. TOTAL COSTS/UNIT (H/A)	$3.14	$2.97	$2.79	$7.14	$0.14	$58.86	---	---
K. RETURN TO ANNUAL COST (I+13)/G	36.90%	-9.39%	-5.63%	-6.06%	-2.52%	37.90%	18.92%	n/a

Print budgets

Dryland crops example profitability summary …

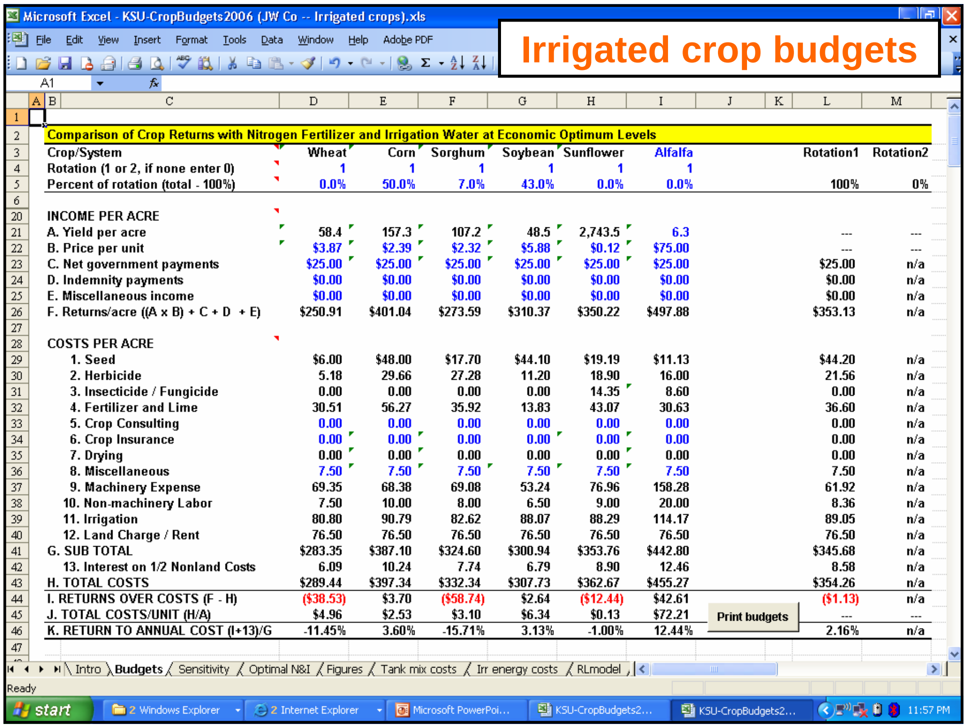
Comparison of Crop Returns under Various Input Price Scenarios						
Crop	Wheat	Corn	Sorghum	Soybean	Sunflower	Wtd Avg
Base scenario[1]	$46.64	($23.27)	($13.92)	($13.92)	($8.97)	$23.50
At forecasted 2006 prices for…						
Fuel[2]	$42.18	($27.29)	($19.08)	($18.77)	($13.75)	$18.83
Fertilizer[2]	$36.88	($29.53)	($19.16)	($14.52)	($13.89)	$15.76
Fuel, fert, and nat gas[2]	$32.42	($33.54)	($24.31)	($19.37)	($18.67)	$11.10

[1] Returns based on current Farm Management Guide costs except fuel, fertilizer, and irrigation pumping (2000-04 avg) and futures-based crop prices as of 2/3/06.

[2] All other costs and crop prices are the same as in base scenario (yields vary with fertilizer and irrigation costs).

Change, $/ac	($14.22)	($10.27)	($10.39)	($5.45)	($9.71)	($12.39)

Irrigated crop budgets



Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels

Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower	Alfalfa	Rotation1	Rotation2
Rotation (1 or 2, if none enter 0)	1	1	1	1	1	1		
Percent of rotation (total - 100%)	0.0%	50.0%	7.0%	43.0%	0.0%	0.0%	100%	0%
INCOME PER ACRE								
A. Yield per acre	58.4	157.3	107.2	48.5	2,743.5	6.3	---	---
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12	$75.00	---	---
C. Net government payments	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	n/a
D. Indemnity payments	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	n/a
E. Miscellaneous income	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	n/a
F. Returns/acre ((A x B) + C + D + E)	$250.91	$401.04	$273.59	$310.37	$350.22	$497.88	$353.13	n/a
COSTS PER ACRE								
1. Seed	$6.00	$48.00	$17.70	$44.10	$19.19	$11.13	$44.20	n/a
2. Herbicide	5.18	29.66	27.28	11.20	18.90	16.00	21.56	n/a
3. Insecticide / Fungicide	0.00	0.00	0.00	0.00	14.35	8.60	0.00	n/a
4. Fertilizer and Lime	30.51	56.27	35.92	13.83	43.07	30.63	36.60	n/a
5. Crop Consulting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
6. Crop Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
7. Drying	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n/a
8. Miscellaneous	7.50	7.50	7.50	7.50	7.50	7.50	7.50	n/a
9. Machinery Expense	69.35	68.38	69.08	53.24	76.96	158.28	61.92	n/a
10. Non-machinery Labor	7.50	10.00	8.00	6.50	9.00	20.00	8.36	n/a
11. Irrigation	80.80	90.79	82.62	88.07	88.29	114.17	89.05	n/a
12. Land Charge / Rent	76.50	76.50	76.50	76.50	76.50	76.50	76.50	n/a
G. SUB TOTAL	$283.35	$387.10	$324.60	$300.94	$353.76	$442.80	$345.68	n/a
13. Interest on 1/2 Nonland Costs	6.09	10.24	7.74	6.79	8.90	12.46	8.58	n/a
H. TOTAL COSTS	$289.44	$397.34	$332.34	$307.73	$362.67	$455.27	$354.26	n/a
I. RETURNS OVER COSTS (F - H)	($38.53)	$3.70	($58.74)	$2.64	($12.44)	$42.61	($1.13)	n/a
J. TOTAL COSTS/UNIT (H/A)	$4.96	$2.53	$3.10	$6.34	$0.13	$72.21	---	---
K. RETURN TO ANNUAL COST (I+13)/G	-11.45%	3.60%	-15.71%	3.13%	-1.00%	12.44%	2.16%	n/a

Irrigated crops example profitability summary …

Comparison of Crop Returns under Various Input Price Scenarios

Crop	Corn	Sorghum	Soybean	Wtd Avg
Base scenario[1]	$3.69	($58.75)	$2.64	($1.13)
At forecasted 2006 prices for…				
Fuel[2]	($3.40)	($65.92)	($2.88)	($7.55)
Fertilizer[2]	($20.83)	($72.20)	$1.34	($14.90)
Natural gas[2]	($24.62)	($77.11)	($19.92)	($26.27)
Fuel, fert, and nat gas[2]	($53.33)	($94.56)	($26.74)	($44.78)

[1] Returns based on current Farm Management Guide costs except fuel, fertilizer, and irrigation pumping (2000-04 avg) and futures-based crop prices as of 2/3/06.
[2] All other costs and crop prices are the same as in base scenario (yields vary with fert and irr costs).

Change, $/ac	($57.02)	($35.81)	($29.37)	($43.64)

Management options…

- What can producers do in response to these high input prices?
- Choices will center around crop selection and input use (i.e., fertilizer, fuel for machinery and irrigation)

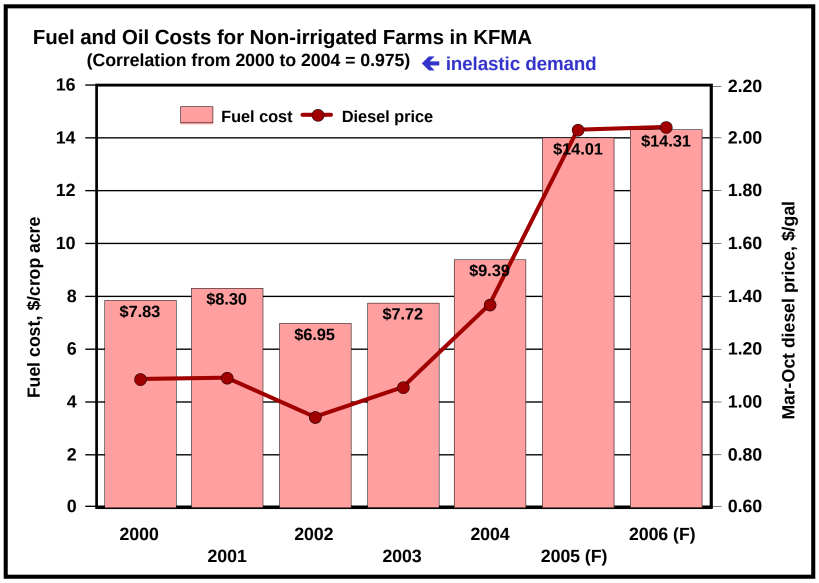
Crop selection…

K-State Crop Budgets as resources

- Projected budgets – Farm Management Guides
- Actual budgets – KFMA Enterprise Analysis
- *KSU-CropBudgets2006.xls*
- All are available on *www.agmanager.info*

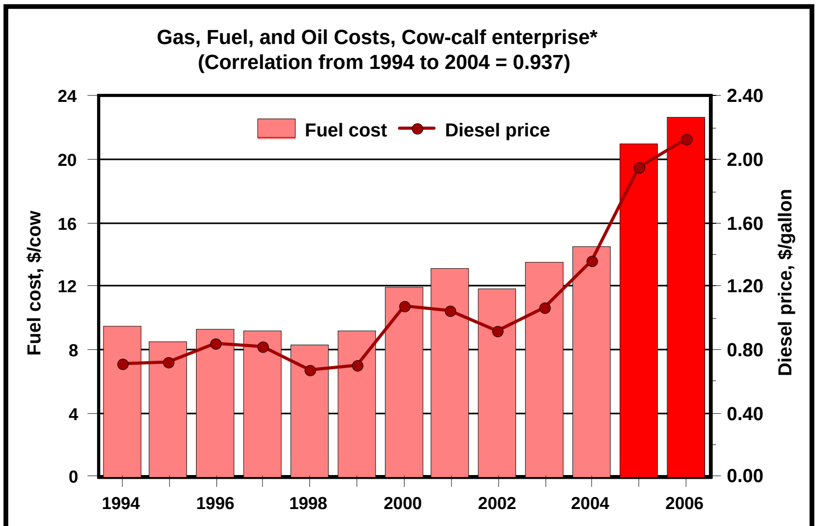
AG MANAGER.INFO
Kansas State Research & Extension
www.agmanager.info

Fuel costs per acre versus diesel prices…



Without any change, costs in 2005 & 2006 will be up substantially on average.

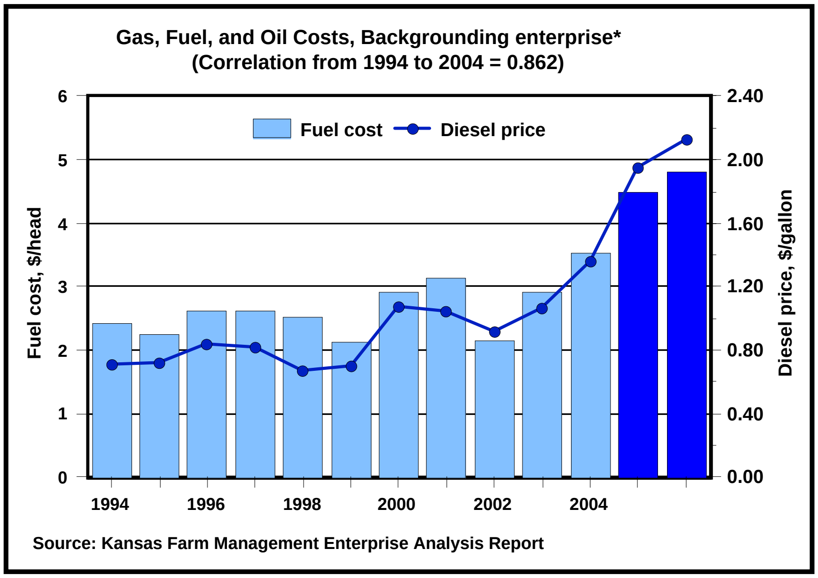
Cow/calf -- Fuel costs per head versus diesel prices…



Source: Kansas Farm Management Enterprise Analysis Report

Without any change, costs in 2005 & 2006 will be up substantially on average.

Backgrounding -- Fuel costs per acre versus diesel prices…



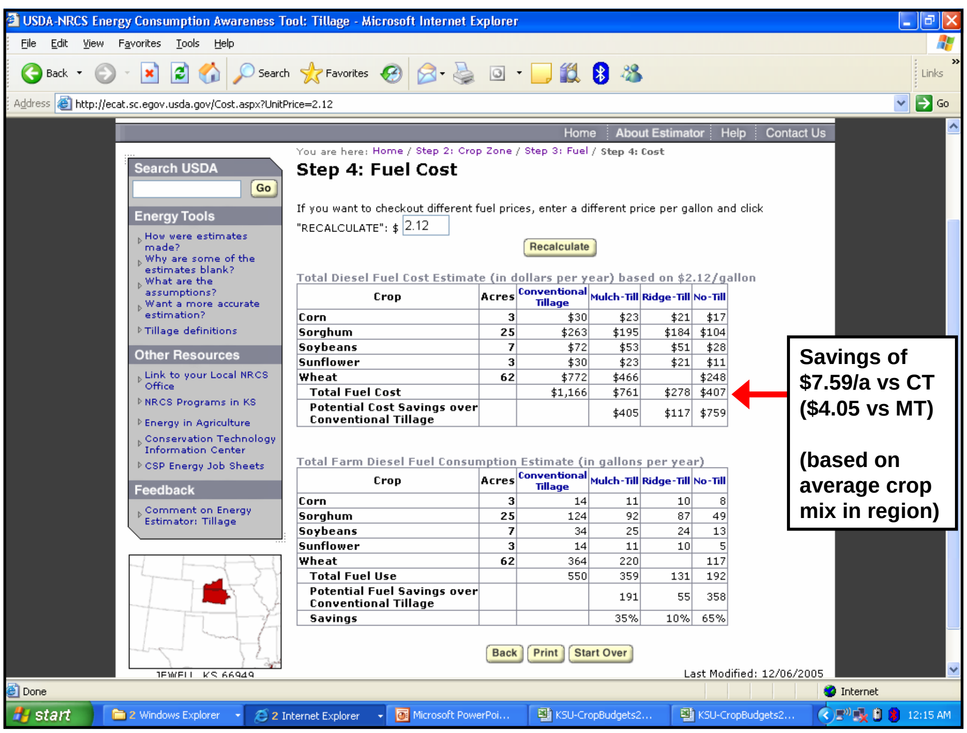
Without any change, costs in 2005 & 2006 will be up substantially on average.

What can producers do is response to higher machinery costs?

Without any change, costs of machinery operations will increase about 7-10% from more "normal" times.

Things to consider…

- Reduce operations?
- Hire custom operators?
- Make sure machinery is properly maintained and used efficiently?
- Pass increased costs on to landowners?
- Nothing?



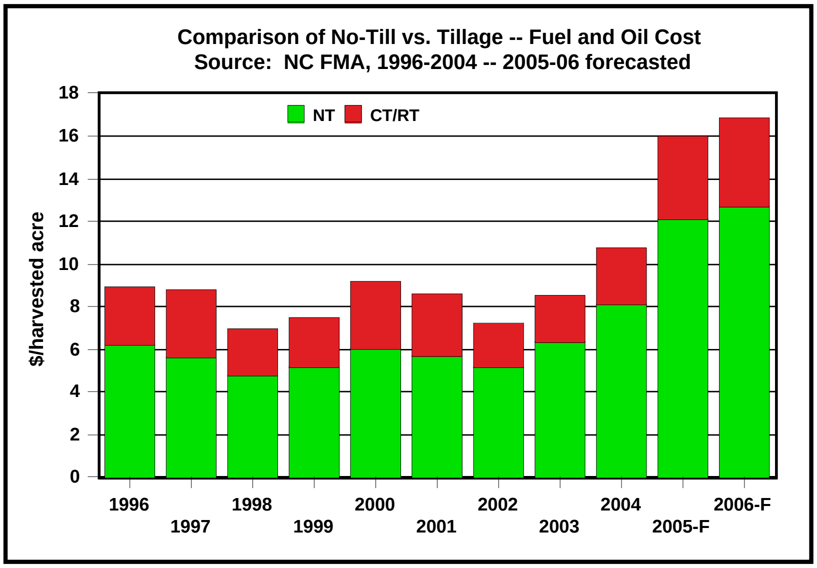
Total Diesel Fuel Cost Estimate (in dollars per year) based on $2.12/gallon

Crop	Acres	Conventional Tillage	Mulch-Till	Ridge-Till	No-Till
Corn	3	$30	$23	$21	$17
Sorghum	25	$263	$195	$184	$104
Soybeans	7	$72	$53	$51	$28
Sunflower	3	$30	$23	$21	$11
Wheat	62	$772	$466		$248
Total Fuel Cost		$1,166	$761	$278	$407
Potential Cost Savings over Conventional Tillage			$405	$117	$759

Total Farm Diesel Fuel Consumption Estimate (in gallons per year)

Crop	Acres	Conventional Tillage	Mulch-Till	Ridge-Till	No-Till
Corn	3	14	11	10	8
Sorghum	25	124	92	87	49
Soybeans	7	34	25	24	13
Sunflower	3	14	11	10	5
Wheat	62	364	220		117
Total Fuel Use		550	359	131	192
Potential Fuel Savings over Conventional Tillage			191	55	358
Savings			35%	10%	65%

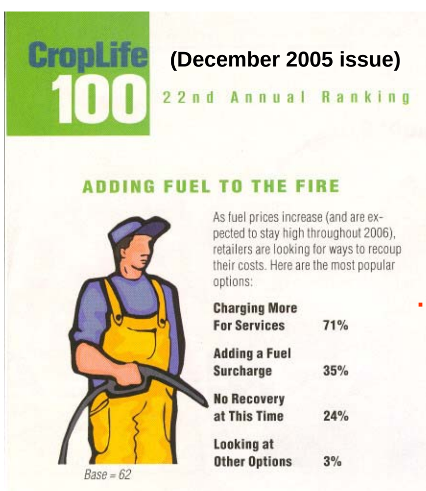
Fuel-savings benefit of no-till increases at higher prices…



NT fuel generally 67-75% of CT/RT, savings could be as high as $4/acre at current diesel prices…

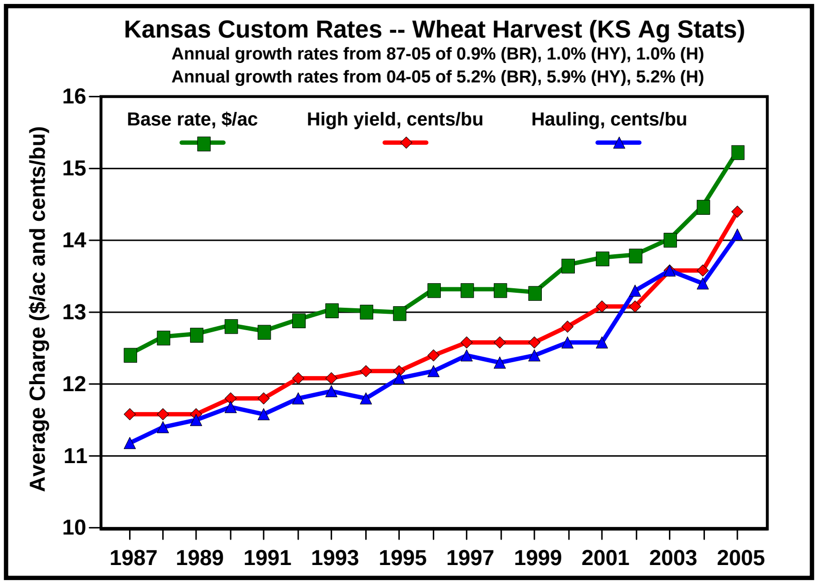
What can a producer do?

Hiring custom operators likely will not be the answer…

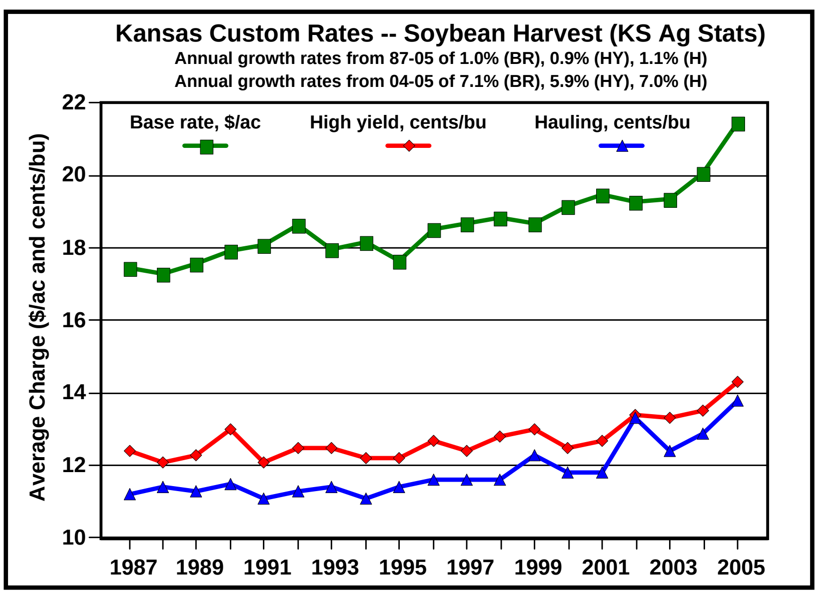


… while some custom operators might not increase their rates, something will have to give (quality of work?).

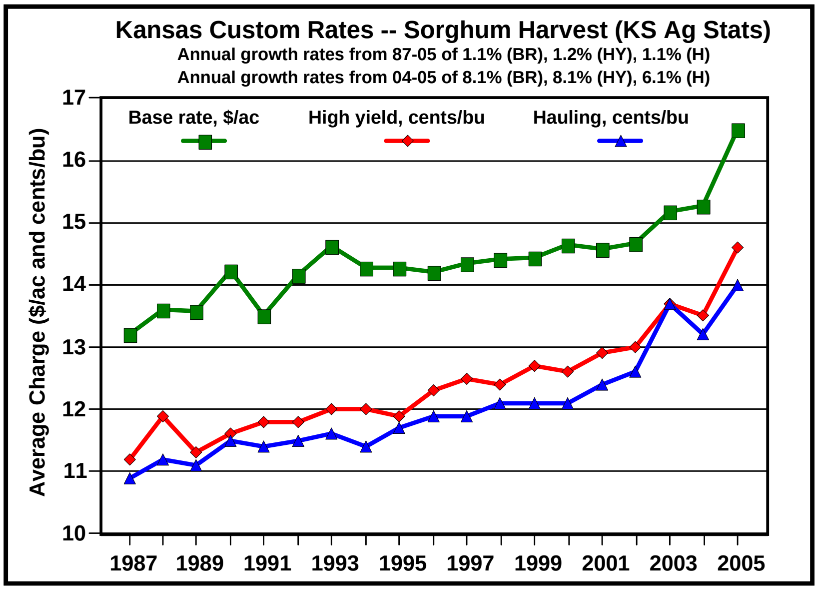
Custom harvesters raised their rates in 2005…



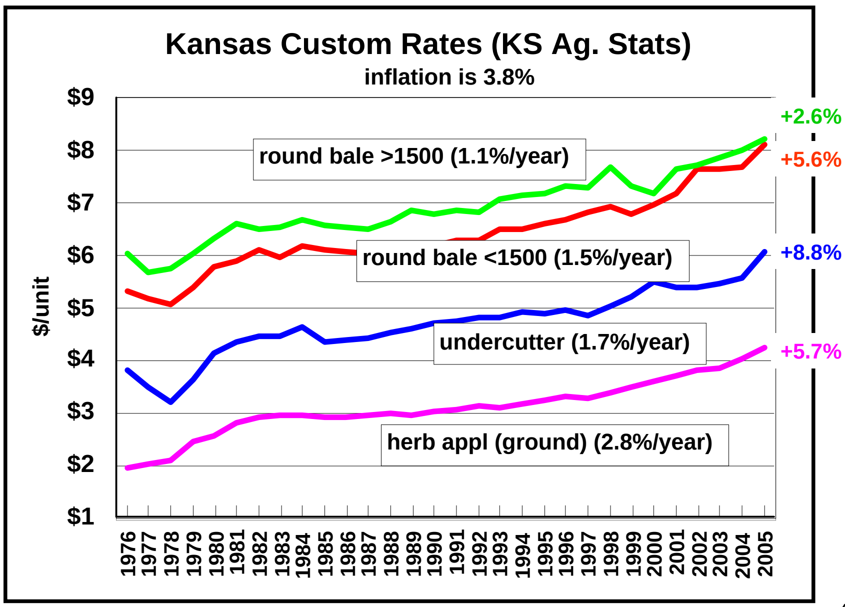
Custom harvesters raised their rates in 2005…



Custom harvesters raised their rates in 2005…



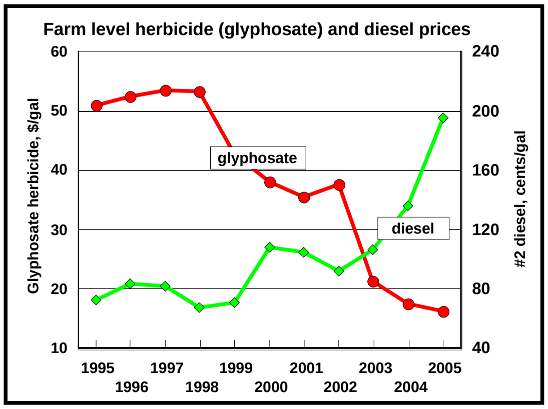
Not all custom rates increased as much in 2005…

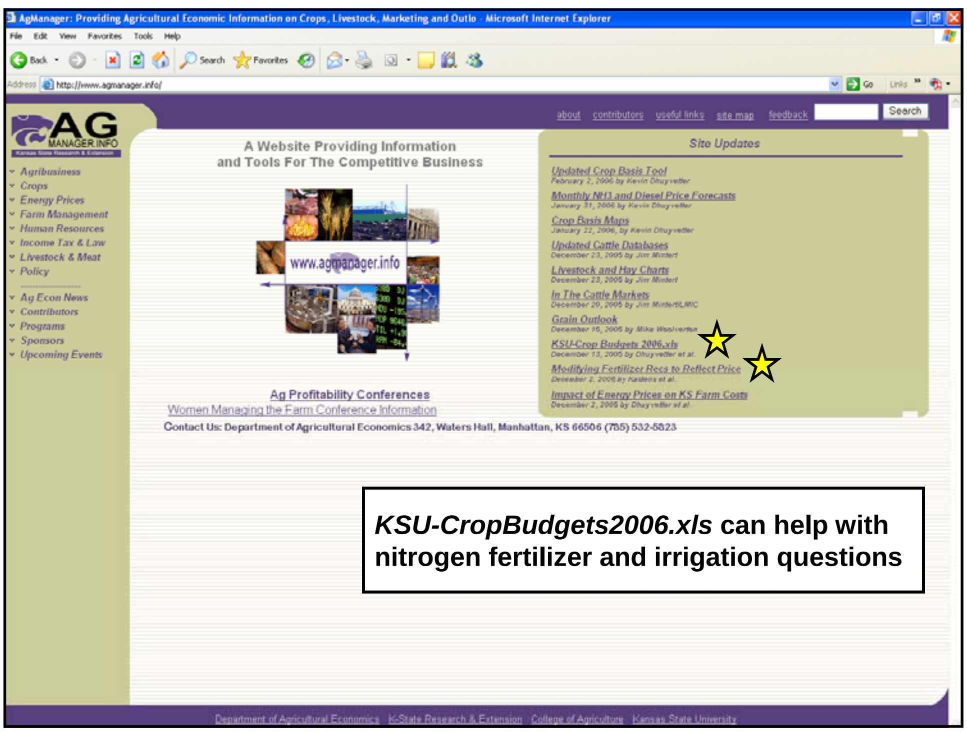


What can a producer do?

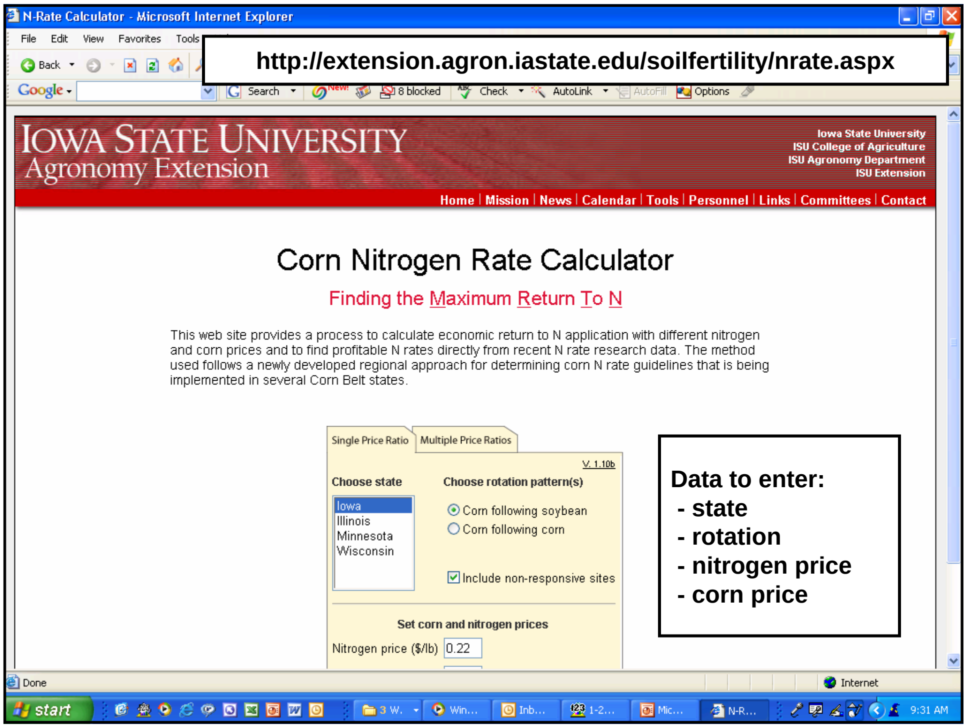
- Benefits of "improved machinery operation" will depend on current situation. While benefit for most producers is likely quite small, cost of doing so is also likely small ➔ *Just do it!*

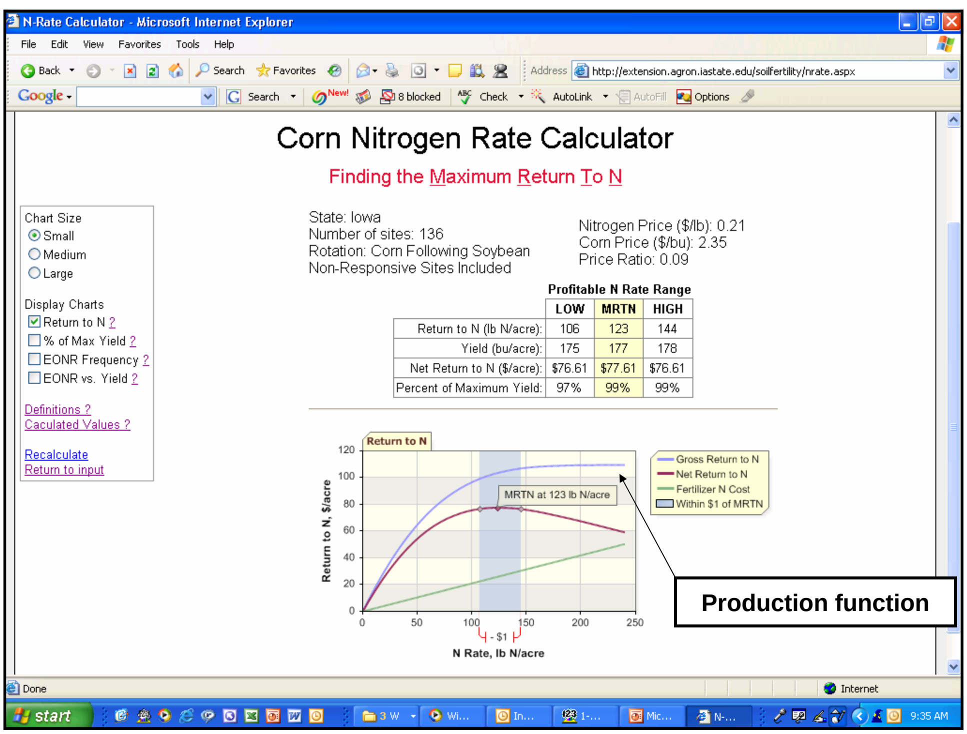
- If you have been thinking of no-till, but have been reluctant to make the change --- now might be the time to make the switch!





KSU-CropBudgets2006.xls **can help with nitrogen fertilizer and irrigation questions**


N-Rate Calculator - Microsoft Internet Explorer
http://extension.agron.iastate.edu/soilfertility/nrate.aspx
IOWA STATE UNIVERSITY
Agronomy Extension
Iowa State University
ISU College of Agriculture
ISU Agronomy Department
ISU Extension
Home | Mission | News | Calendar | Tools | Personnel | Links | Committees | Contact
Corn Nitrogen Rate Calculator
Finding the Maximum Return To N
This web site provides a process to calculate economic return to N application with different nitrogen and corn prices and to find profitable N rates directly from recent N rate research data. The method used follows a newly developed regional approach for determining corn N rate guidelines that is being implemented in several Corn Belt states.
Single Price Ratio
Multiple Price Ratios
V. 1.10b
Choose state
Iowa
Illinois
Minnesota
Wisconsin
Choose rotation pattern(s)
Corn following soybean
Corn following corn
Include non-responsive sites
Set corn and nitrogen prices
Nitrogen price ($/lb) 0.22
Data to enter:
- state
- rotation
- nitrogen price
- corn price
Done
Internet
start
9:31 AM


N-Rate Calculator - Microsoft Internet Explorer
http://extension.agron.iastate.edu/soilfertility/nrate.aspx
Corn Nitrogen Rate Calculator
Finding the Maximum Return To N
Chart Size
Small
Medium
Large
Display Charts
Return to N ?
% of Max Yield ?
EONR Frequency ?
EONR vs. Yield ?
Definitions ?
Caculated Values ?
Recalculate
Return to input
State: Iowa
Number of sites: 136
Rotation: Corn Following Soybean
Non-Responsive Sites Included
Nitrogen Price ($/lb): 0.21
Corn Price ($/bu): 2.35
Price Ratio: 0.09
Profitable N Rate Range
LOW MRTN HIGH
Return to N (lb N/acre): 106 123 144
Yield (bu/acre): 175 177 178
Net Return to N ($/acre): $76.61 $77.61 $76.61
Percent of Maximum Yield: 97% 99% 99%
Return to N
MRTN at 123 lb N/acre
Gross Return to N
Net Return to N
Fertilizer N Cost
Within $1 of MRTN
Return to N, $/acre
N Rate, lb N/acre
- $1
Production function
Done
Internet
start
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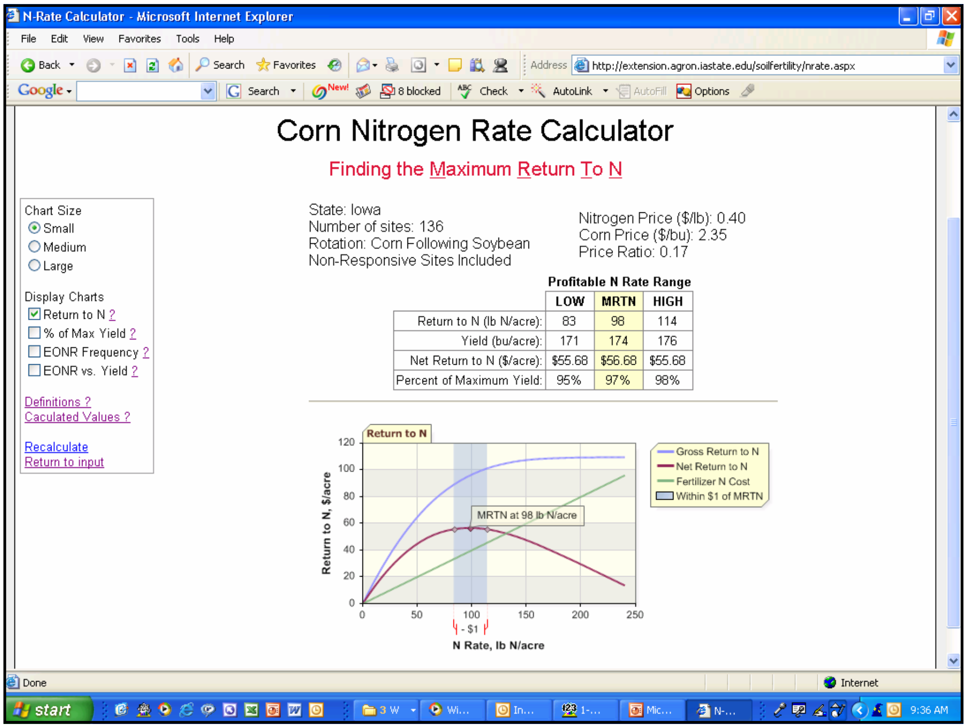


Modifying KSU nitrogen recommendations based upon prices…

Nitrogen Recommendations for Wheat

Yield goal, bu/ac	40	50	60	70	80
KSU N rec, lbs/ac	56	80	104	128	152

N price	Price adjusted N rec, lbs/ac				
$0.25	56	80	104	128	152
$0.30	54	78	102	125	149
$0.35	53	76	99	122	145
$0.40	51	73	96	119	142
$0.45	49	71	94	116	138

N price	Price adjusted N rec reduction				
$0.25	-0.3%	-0.2%	-0.2%	-0.2%	-0.2%
$0.30	2.9%	2.6%	2.4%	2.2%	2.2%
$0.35	6.1%	5.3%	4.9%	4.7%	4.5%
$0.40	9.3%	8.1%	7.5%	7.1%	6.8%
$0.45	12.5%	10.9%	10.1%	9.6%	9.2%

SOM=2.0; STN=20; Wheat price=$3.87

Modifying KSU nitrogen recommendations based upon prices…

Nitrogen Recommendations for Corn

Yield goal, bu/ac	60	90	120	150	180
KSU N rec, lbs/ac	36	84	132	180	228

N price	Price adjusted N rec, lbs/ac				
$0.25	35	82	129	177	224
$0.30	33	79	125	172	218
$0.35	31	76	122	167	213
$0.40	29	73	118	162	207
$0.45	27	71	114	158	201

N price	Price adjusted N rec reduction				
$0.25	3.8%	2.5%	2.1%	1.9%	1.8%
$0.30	9.1%	5.8%	4.9%	4.5%	4.3%
$0.35	14.3%	9.2%	7.8%	7.2%	6.8%
$0.40	19.6%	12.6%	10.7%	9.8%	9.3%
$0.45	24.8%	15.9%	13.5%	12.4%	11.7%

SOM=2.0; STN=20; Corn price=$2.39

Modifying KSU nitrogen recommendations based upon prices…

Nitrogen Recommendations for Grain Sorghum

Yield goal, bu/ac	50	75	100	125	150
KSU N rec, lbs/ac	20	60	100	140	180

N price	Price adjusted N rec, lbs/ac				
$0.25	20	59	99	139	179
$0.30	18	57	96	135	174
$0.35	16	54	92	130	169
$0.40	15	52	89	126	164
$0.45	13	49	86	122	159

N price	Price adjusted N rec reduction				
$0.25	2.4%	1.2%	1.0%	0.9%	0.8%
$0.30	10.7%	5.4%	4.3%	3.8%	3.6%
$0.35	19.0%	9.5%	7.6%	6.8%	6.3%
$0.40	27.3%	13.7%	10.9%	9.8%	9.1%
$0.45	35.6%	17.8%	14.3%	12.7%	11.9%

SOM=2.0; STN=20; Sorghum price=$2.32

Dryland optimal fertilizer N values @ $0.206/lb N

Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels					
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower
Rotation (1 or 2, if none enter 0)	1	1	1	1	1
Percent of rotation (total - 100%)	62.0%	3.0%	25.0%	7.0%	3.0%
Yield Goal (YG), bu/ac	45.0	65.0	60.0	23.0	1250.0
Enter 0 for Dryland or 1 for Irrigated	0	0	0	0	0
Annual rainfall	26.0	26.0	26.0	26.0	26.0
Organic matter (OM), %	2.00	2.00	2.00	2.00	2.00
Soil test nitrogren (STN), lbs/ac	20.0	20.0	20.0	20.0	20.0
Other N adjustments, lbs/ac	0.0	0.0	0.0	0.0	0.0
Nitrogen fertilizer cost, $/lb	$0.206	$0.206	$0.206	$0.206	$0.206
Irrigation energy cost, $/inch	$1.97	$1.97	$1.97	$1.97	$1.97
KSU recommended nitrogen, lbs/ac	68.0	44.0	36.0	0.0	33.8
Econ Optimum fertN, lbs/ac	69.9	44.3	37.2	0.0	33.8
Econ Optimum Irrigation Amount, in	0.0	0.0	0.0	0.0	0.0
Yield at optimal N and I, bu/ac	44.8	64.6	59.6	22.3	1243.9
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12

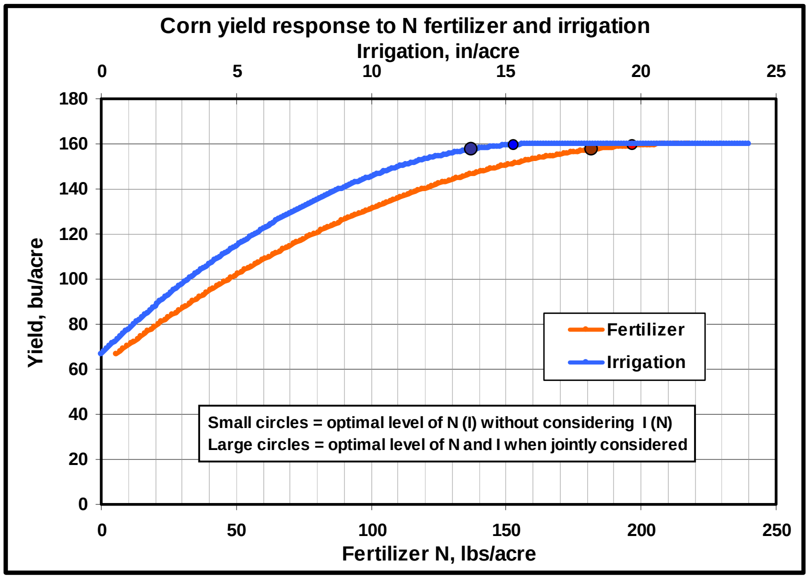
Optimal rates are exceed KSU recommendations because prices are above long-term averages

Dryland optimal fertilizer N values @ $0.338/lb N

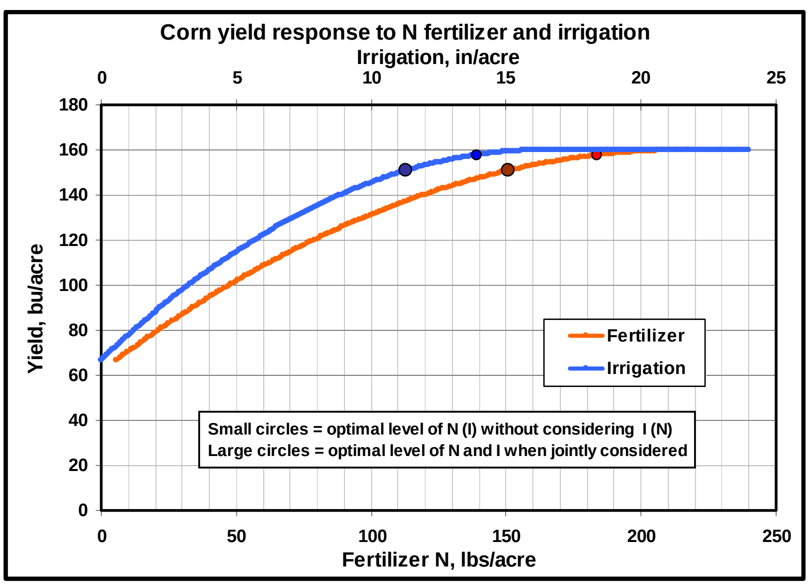
Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels					
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower
Rotation (1 or 2, if none enter 0)	1	1	1	1	1
Percent of rotation (total - 100%)	62.0%	3.0%	25.0%	7.0%	3.0%
Yield Goal (YG), bu/ac	45.0	65.0	60.0	23.0	1250.0
Enter 0 for Dryland or 1 for Irrigated	0	0	0	0	0
Annual rainfall	26.0	26.0	26.0	26.0	26.0
Organic matter (OM), %	2.00	2.00	2.00	2.00	2.00
Soil test nitrogren (STN), lbs/ac	20.0	20.0	20.0	20.0	20.0
Other N adjustments, lbs/ac	0.0	0.0	0.0	0.0	0.0
Nitrogen fertilizer cost, $/lb	$0.338	$0.338	$0.338	$0.338	$0.338
Irrigation energy cost, $/inch	$1.97	$1.97	$1.97	$1.97	$1.97
KSU recommended nitrogen, lbs/ac	68.0	44.0	36.0	0.0	33.8
Econ Optimum fertN, lbs/ac	64.6	38.9	31.9	0.0	29.3
Econ Optimum Irrigation Amount, in	0.0	0.0	0.0	0.0	0.0
Yield at optimal N and I, bu/ac	44.4	64.0	59.0	22.3	1233.5
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12

Optimal rates are about 10-15% less than KSU recommendations at high N price

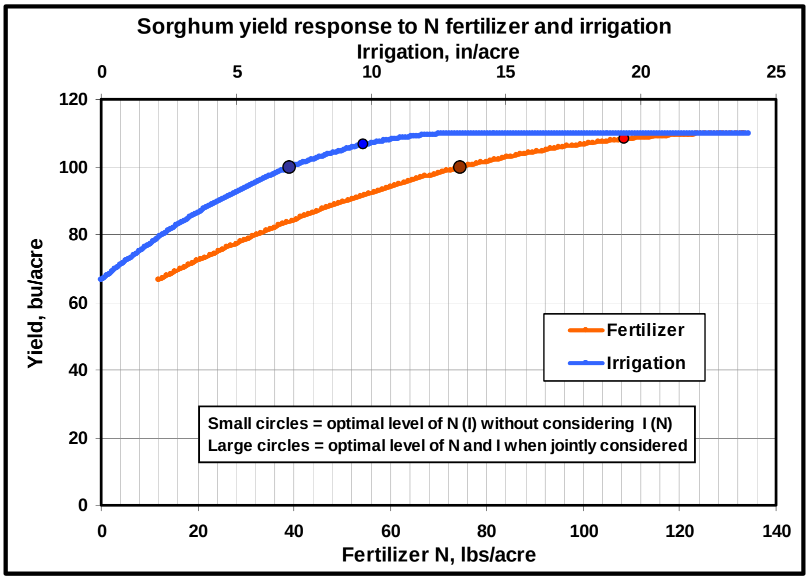
When considering irrigation and N together, optimal values decrease significantly [LOW PRICES]…



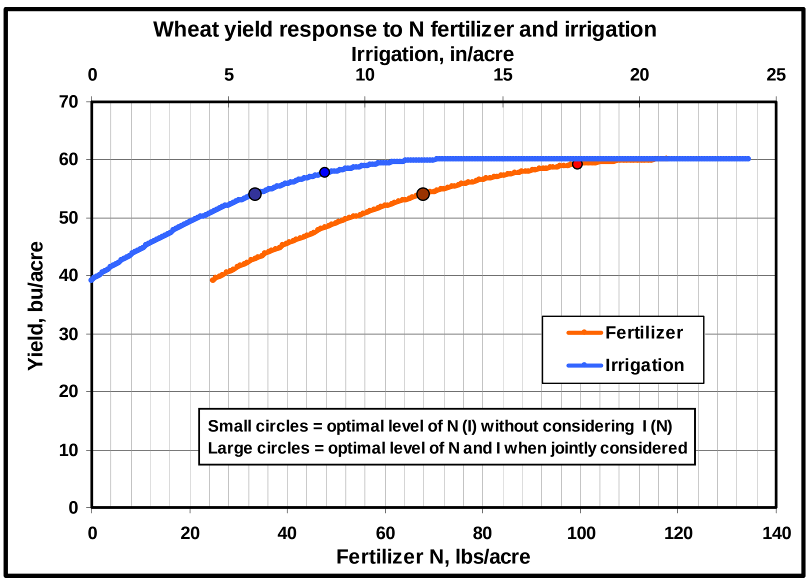
When considering irrigation and N together, optimal values decrease significantly [HIGH PRICES]…



When considering irrigation and N together, optimal values decrease significantly [HIGH PRICES]…



When considering irrigation and N together, optimal values decrease significantly [HIGH PRICES]…



Irrigated optimal fert N values @ $0.206/lb N & $1.97/in

Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels					
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower
Rotation (1 or 2, if none enter 0)	1	1	1	1	1
Percent of rotation (total - 100%)	0.0%	50.0%	7.0%	43.0%	0.0%
Yield Goal (YG), bu/ac	60.0	160.0	110.0	50.0	2800.0
Enter 0 for Dryland or 1 for Irrigated	1	1	1	1	1
Annual rainfall	24.0	24.0	24.0	24.0	24.0
Organic matter (OM), %	2.00	2.00	2.00	2.00	2.00
Soil test nitrogren (STN), lbs/ac	20.0	20.0	20.0	20.0	20.0
Other N adjustments, lbs/ac	0.0	0.0	0.0	0.0	0.0
Nitrogen fertilizer cost, $/lb	$0.206	$0.206	$0.206	$0.206	$0.206
Irrigation energy cost, $/inch	$1.97	$1.97	$1.97	$1.97	$1.97
KSU recommended nitrogen, lbs/ac	104.0	196.0	116.0	0.0	150.0
Econ Optimum fertN, lbs/ac	91.6	181.7	102.1	0.0	133.9
Econ Optimum Irrigation Amount, in	9.3	13.7	10.1	12.5	12.6
Yield at optimal N and I, bu/ac	58.4	157.3	107.2	48.5	2743.5
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12

Optimal rates are below KSU recommendations because of irrigation

Irrigated optimal fert N values @ $0.338/lb N & $1.97/in

Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels					
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower
Rotation (1 or 2, if none enter 0)	1	1	1	1	1
Percent of rotation (total - 100%)	0.0%	50.0%	7.0%	43.0%	0.0%
Yield Goal (YG), bu/ac	60.0	160.0	110.0	50.0	2800.0
Enter 0 for Dryland or 1 for Irrigated	1	1	1	1	1
Annual rainfall	24.0	24.0	24.0	24.0	24.0
Organic matter (OM), %	2.00	2.00	2.00	2.00	2.00
Soil test nitrogren (STN), lbs/ac	20.0	20.0	20.0	20.0	20.0
Other N adjustments, lbs/ac	0.0	0.0	0.0	0.0	0.0
Nitrogen fertilizer cost, $/lb	$0.338	$0.338	$0.338	$0.338	$0.338
Irrigation energy cost, $/inch	$1.97	$1.97	$1.97	$1.97	$1.97
KSU recommended nitrogen, lbs/ac	104.0	196.0	116.0	0.0	150.0
Econ Optimum fertN, lbs/ac	85.2	167.6	92.3	0.0	123.6
Econ Optimum Irrigation Amount, in	8.4	12.6	9.0	12.5	11.5
Yield at optimal N and I, bu/ac	57.5	154.8	105.1	48.5	2701.4
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12

Optimal rates decrease 10-15% at high N price

Irrigated optimal fert N values @ $0.338/lb N & $4.21/in

Comparison of Crop Returns with Nitrogen Fertilizer and Irrigation Water at Economic Optimum Levels					
Crop/System	Wheat	Corn	Sorghum	Soybean	Sunflower
Rotation (1 or 2, if none enter 0)	1	1	1	1	1
Percent of rotation (total - 100%)	0.0%	50.0%	7.0%	43.0%	0.0%
Yield Goal (YG), bu/ac	60.0	160.0	110.0	50.0	2800.0
Enter 0 for Dryland or 1 for Irrigated	1	1	1	1	1
Annual rainfall	24.0	24.0	24.0	24.0	24.0
Organic matter (OM), %	2.00	2.00	2.00	2.00	2.00
Soil test nitrogren (STN), lbs/ac	20.0	20.0	20.0	20.0	20.0
Other N adjustments, lbs/ac	0.0	0.0	0.0	0.0	0.0
Nitrogen fertilizer cost, $/lb	$0.338	$0.338	$0.338	$0.338	$0.338
Irrigation energy cost, $/inch	$4.21	$4.21	$4.21	$4.21	$4.21
KSU recommended nitrogen, lbs/ac	104.0	196.0	116.0	0.0	150.0
Econ Optimum fertN, lbs/ac	67.9	150.9	74.4	0.0	105.8
Econ Optimum Irrigation Amount, in	6.0	11.3	7.0	11.1	9.6
Yield at optimal N and I, bu/ac	54.0	150.8	99.8	48.5	2601.3
B. Price per unit	$3.87	$2.39	$2.32	$5.88	$0.12

At high N and irrigation costs, optimal rates decrease significantly

Impact of high costs on leases …

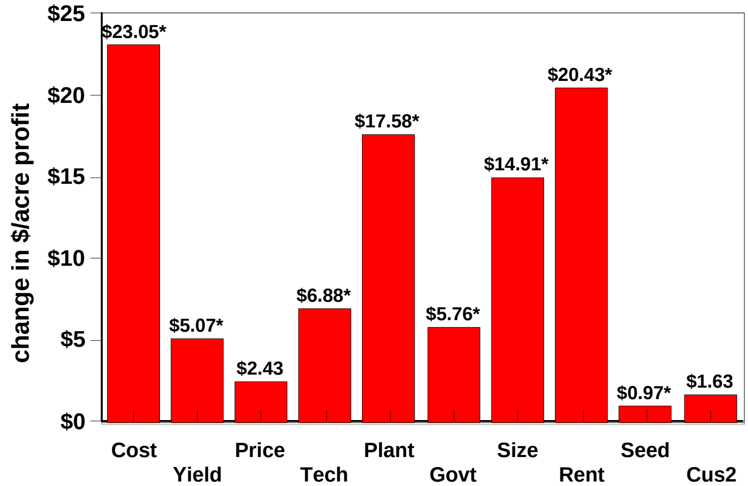
KSU-Lease.xls **is a tool that can be used to analyze the impact of current costs have on equitable crop share leases as well as their cash-rent equivalents**

The impact high costs have on leases will depend on each specific situation due to how producers change (or not change) production practices in response to these high prices

➔ producers should "run their own numbers"

Some producers will be able to absorb increased cost much easier than others…

(95-04) diff in profit (over avg farm) by being in best 1/3 of:



* statistically different from 0 at 90% confidence

Summary …

- High input prices will have significant impact on crop returns in 2006
  - -- Irrigated crops impacted more than dryland crops
  - -- Feedgrains impacted more than soybeans
  - -- How producers "manage" for this will depend on their unique situations
- High diesel fuel prices will impact returns, but they have relatively minor impact on equitable crop share percentages
- Crop share tenants will not be impacted nearly as much as those cash renting (assuming fertilizer and irrigation pumping expenses are being shared)

Summary …

- Producers cash renting may want to negotiate with landowners to see if they will help “share the pain” (likewise for crop share tenants not sharing fertilizer or irrigation pumping costs)

- Producers need to “do their homework” to make sure they understand the numbers before talking to their landowner(s)

- Tenants need to think long-term when negotiating with landowners
  - -- Impact of losing or giving up land?
  - -- Have “good times” been shared?