

# **An Assessment of the State of the Agricultural Economy due to Increased Energy Prices Associated with Hurricanes Katrina and Rita**

Testimony to the U.S. House of Representatives, Committee on Agriculture,  
Subcommittee on General Farm Commodities and Risk Management

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September 23, 2005

## **Introductory comments**

The general outlook for farm incomes across Kansas must take into account the substantial increase in fuel and fertilizer prices directly used on farms, as well as the higher costs of other inputs and services due to petroleum-based products. In light of the damage caused by Hurricanes Katrina and Rita in the Gulf Coast states and the other off-shore locations, there likely will be additional stress on farms due to the increase in input prices as well as other contributing factors such as mobility of export products through existing channels and the higher level of costs due to the tremendous strain placed on the U.S. economy as a whole. While the final impacts of these two massive storms is yet to be known, it is our intention to provide you further information as it becomes available.

## **Energy Forecasts**

The following tables and charts show expenses for three major crop inputs for Kansas farmers – fuel and oil, irrigation energy, and fertilizer. With the possible exception of irrigation energy, these costs are important for most producers in the U.S., especially those located in the High Plains and Corn Belt regions. Costs are reported for the previous five years (2000-2004) as well as forecasts for 2005 and 2006. Forecasts for diesel prices and natural gas are based on an average of KSU models and Energy Information Administration (EIA) models. Fertilizer price forecasts are based on KSU models only. The KSU models are based on New York Mercantile Exchange (NYMEX) closing futures prices for crude oil and natural gas as of September 22, 2005. The reason for using an average forecast from several sources is that research has shown that composite forecasts generally are more accurate than individual forecasts.

Forecasts for whole-farm expenses for 2005 and 2006 are based on changes in input prices implicitly assuming that producers do not change their production practices significantly in response to the higher prices. For individual farms, this assumption may not hold, however, historical evidence suggests that at the aggregate level producers generally do not make major changes in response to price. Furthermore, research examining optimal input use (e.g., fertilizer, irrigation water) shows that input levels are reduced only marginally when prices increase. That is, producers still use similar amounts of the input for optimal economic production, but their economic returns decrease due to the higher input prices.

With the 2005 information that is in, and for all three inputs considered, costs are expected to increase significantly in 2005 relative to the previous 5-year average (2000-2004). Percentage increases in prices range from a low of +39.7% for fertilizer (composite of individual products) to a high of +94.8% for natural gas. Furthermore, prices in 2006 are forecasted to be above the

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historically high levels of 2005. This is especially true for fertilizer prices which are forecasted to increase significantly in the fall of 2005 and spring of 2006.

Using the Kansas Farm Management Association (KFMA) Summary's dryland and irrigated farm types, the expense categories of Gas-Fuel-Oil, Fertilizer, and Irrigation Energy were assigned to an energy expense "complex." Across all farms and on a per acre basis, the impact of higher fuel and oil, irrigation energy, and fertilizer prices will increase costs in 2005 approximately \$8-\$10 per acre for farms in Kansas compared to the previous 5-year average. An increase of this magnitude is also expected for 2006 relative to 2005. The cost per irrigated acre in the KFMA Summary due to the increase in the energy expense complex is expected to rise \$32.89 in 2005 and another \$15.60 in 2006. The cost per dryland acre in the KFMA Summary is expected to increase \$5.72 from 2004 to 2005 with an additional \$8.44 projected for 2006. Assuming that producers do not make major production changes, land rents would need to decrease by \$14.16 per acre for dryland acres and \$48.49 for irrigated acres from 2004 to 2006 in order to offset the impact of higher energy costs alone.

Based on an average from 2000 – 2004, the percentage of Total Operating Expense for these farms represented by the energy expense complex is 22.8% for dryland crop farms and 29.9% for irrigated crop farms. Holding other expenses constant while using the projected future expenses for the energy complex suggests those figures would rise to 33.0% and 41.4% for dryland and irrigated crop farms, respectively, in 2006.

Holding prices, yields and other factors constant; if the 2004 KFMA Summary dryland producers were to absorb the increase in the energy expense complex alone, they would reduce Net Farm Income by \$22,227 from 2004 to 2006. For irrigated producers in the 2004 KFMA Summary the reduction in Net Farm Income would be \$51,832 in 2006. These figures would represent a reduction in net farm income respectively of 39.8% and 93.6% from 2004 levels.

Given that Machine Hire, Utilities and other costs directly affected by energy prices are expected to increase significantly during this same timeframe we would expect additional upward pressure on input prices. Additional costs are expected for inputs utilizing petroleum-based products such as agricultural chemicals. Furthermore, the increase in building materials and other necessary items in the operation and upkeep of farms likely will continue to impact the total operating expenses of agricultural enterprises.

Revenues would be expected to decline in 2005 as yields for the primary fall crops in Kansas are expected to decline from the historically high levels of 2004. The Kansas Crops Report released by the Kansas Agricultural Statistics Service September 1, 2005 indicates that corn, soybean and sorghum grain production are forecasted to be down considerably in 2005: by 20, 5, and 2 bushels, respectively. While wheat yields statewide were up 2 bushels in 2005 compared to 2004, the overall crop production across the state is down considerably.

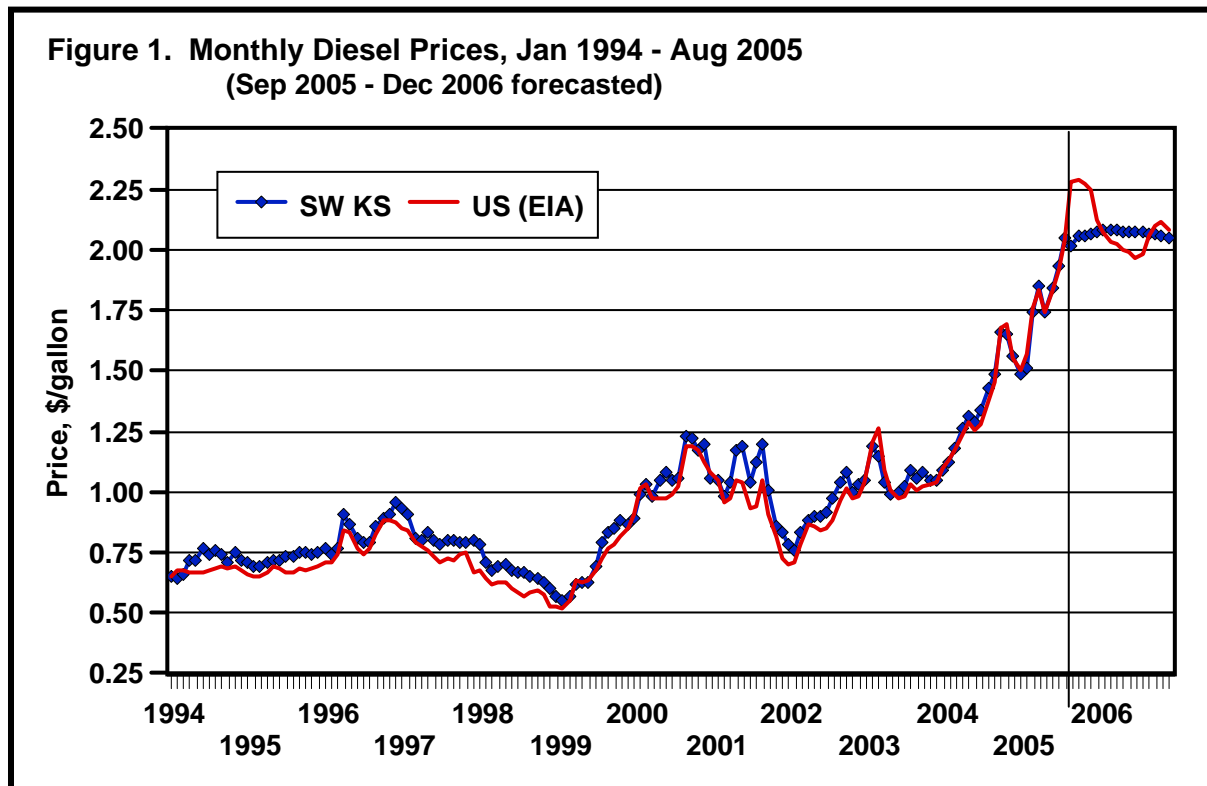
Factoring in historically high yields for major crops across Kansas in 2004 and downward pressure on farm-level agricultural commodity prices with higher fuel prices and limited export flows, a sustained level of revenues for Kansas farm families in 2005 is not expected. Reduced revenues and increased expenses result in a more pessimistic outlook for overall net farm incomes.

**Table 1. Diesel Prices**

Year	Mar-Oct Diesel Price			Year-to-year percent change		
	SW KS	US (EIA)	Average	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 (P)	\$1.90	\$1.96	\$1.93	38.9%	45.9%	42.4%
2006 (F)	\$2.07	\$2.02	\$2.05	9.0%	3.0%	5.9%
05 - Avg(00-04)	\$0.79	\$0.90	\$0.85	71.6%	85.1%	78.2%
06 - Avg(00-04)	\$0.96	\$0.96	\$0.96	87.0%	90.6%	88.7%

P = preliminary (actual prices through August 2005, Sept and Oct are forecasts)

F = forecast

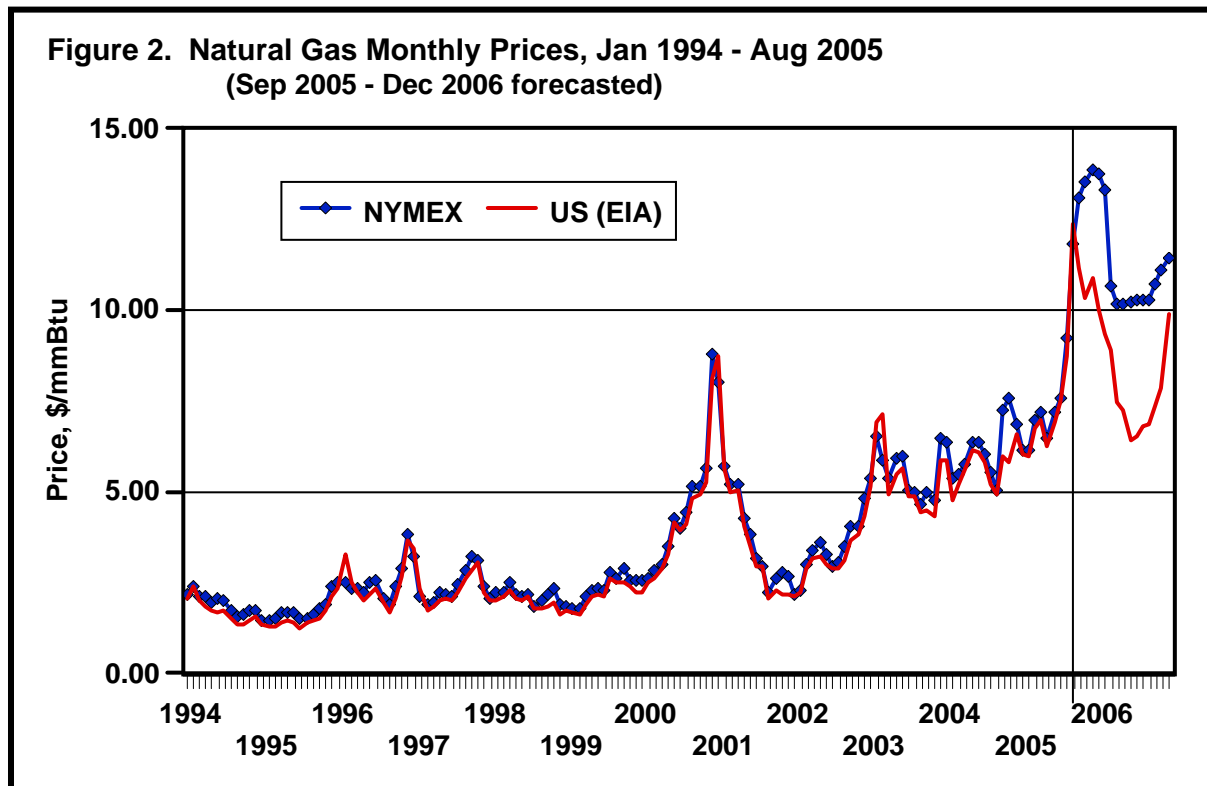


**Table 2. Natural Gas Prices**

Year	Mar-Oct Natural Gas Price			Year-to-year percent change		
	NYMEX	US (EIA)	Average	NYMEX	US (EIA)	Average
2000	\$4.04	\$3.85	\$3.95	-----	-----	-----
2001	\$3.69	\$3.49	\$3.59	-8.6%	-9.3%	-9.0%
2002	\$3.35	\$3.12	\$3.23	-9.2%	-10.7%	-10.0%
2003	\$5.35	\$5.24	\$5.30	59.5%	68.2%	63.7%
2004	\$5.99	\$5.63	\$5.81	11.9%	7.5%	9.7%
2005 (P)	\$8.70	\$8.34	\$8.52	45.4%	48.1%	46.7%
2006 (F)	\$10.36	\$7.20	\$8.78	19.0%	-13.7%	3.0%
05 - Avg(00-04)	\$4.22	\$4.08	\$4.15	94.0%	95.6%	94.8%
06 - Avg(00-04)	\$5.87	\$2.94	\$4.40	130.9%	68.8%	100.7%

P = preliminary (actual prices through August 2005, Sept and Oct are forecasts)

F = forecast

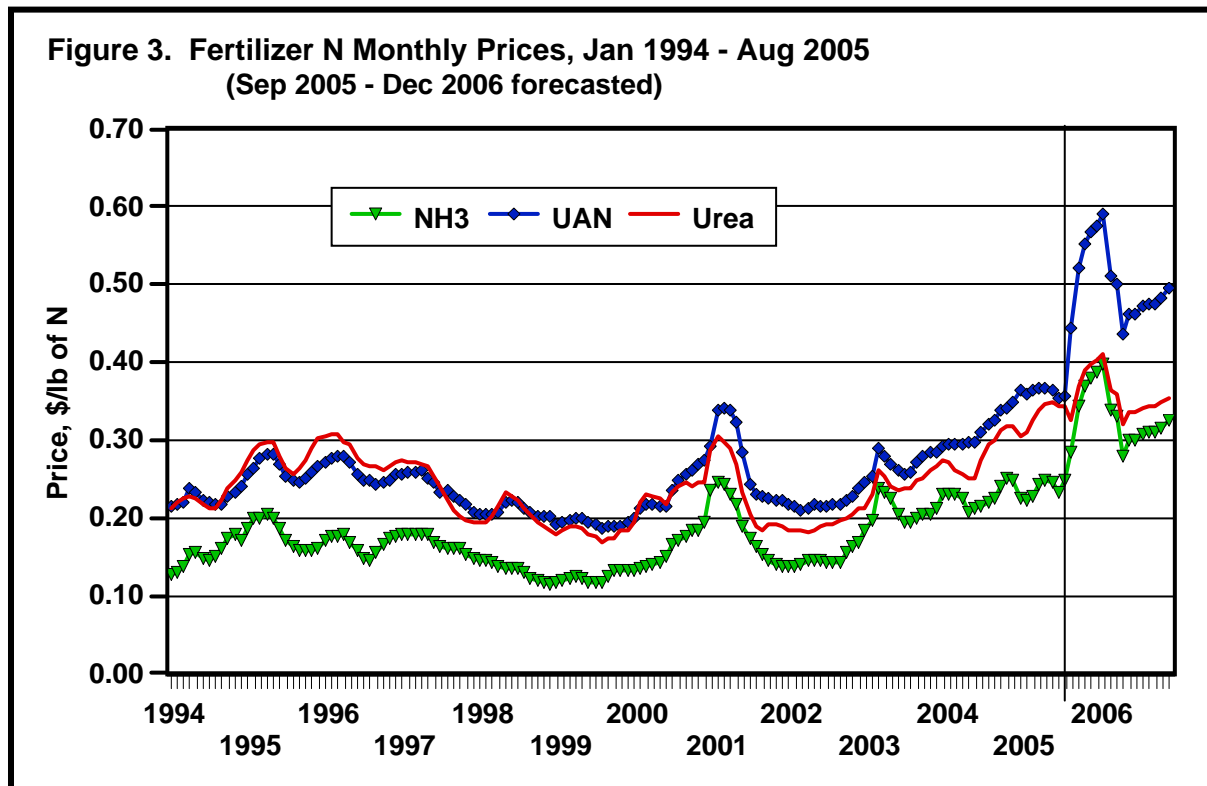


**Table 3. Fertilizer Prices (Corn Belt)**

Percent of total	40.0%	17.5%	17.5%	20.0%	5.0%	100.0%	
	Oct-May Fertilizer Price*						Year-to-year
Year	NH3 (82%)	UAN (32%)	Urea (46%)	- P -	- K -	Wtd Avg	% change
2000	222.80	130.49	188.59	218.40	177.78	197.53	-----
2001	355.87	194.93	250.31	225.73	177.30	274.27	38.9%
2002	231.93	139.39	171.91	210.48	172.43	197.96	-27.8%
2003	320.33	162.11	208.69	227.49	169.25	246.98	24.8%
2004	357.91	185.50	240.79	243.71	169.45	274.98	11.3%
2005	390.58	228.15	296.30	262.62	208.54	310.96	13.1%
2006 (F)	578.98	340.43	346.31	284.30	216.57	419.46	34.9%
05 - Avg(00-04)	\$92.82	\$65.66	\$84.25	\$37.46	\$35.30	\$72.62	39.7%
06 - Avg(00-04)	\$281.22	\$177.94	\$134.26	\$59.14	\$43.33	\$181.12	63.3%

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

F = forecast

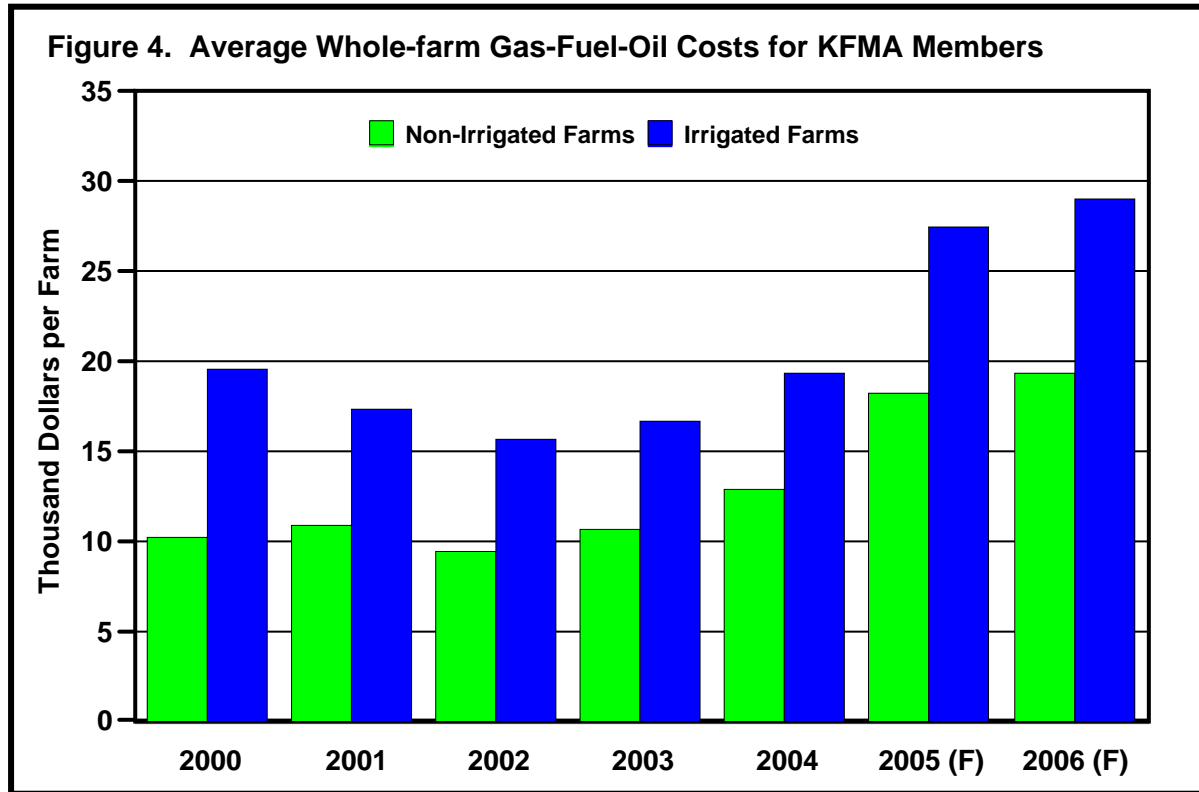


**Table 4. Whole-farm Gas, Fuel & Oil Expenses from KFMA Annual ProfitLink Summary**

Year	Non-Irrigated Farms		Irrigated Farms		Weighted Average
	Dollars	Number	Dollars	Number	
2000	\$10,192	1,367	\$19,617	140	\$11,068
2001	\$10,897	1,308	\$17,345	129	\$11,476
2002	\$9,431	1,270	\$15,696	122	\$9,980
2003	\$10,685	1,210	\$16,716	117	\$11,217
2004	\$12,820	1,179	\$19,285	109	\$13,367
2005 (F)	\$18,251	1,179	\$27,455	109	\$19,030
2006 (F)	\$19,331	1,179	\$29,079	109	\$20,156

and 2006 relative to the actual diesel price in 2004.

'05 chg from '04	\$5,431	42.4%	\$8,170	42.4%	\$5,663
'06 chg from '05	\$1,080	5.9%	\$1,624	5.9%	\$1,126
'06 chg from '04	\$6,511	50.8%	\$9,794	50.8%	\$6,789

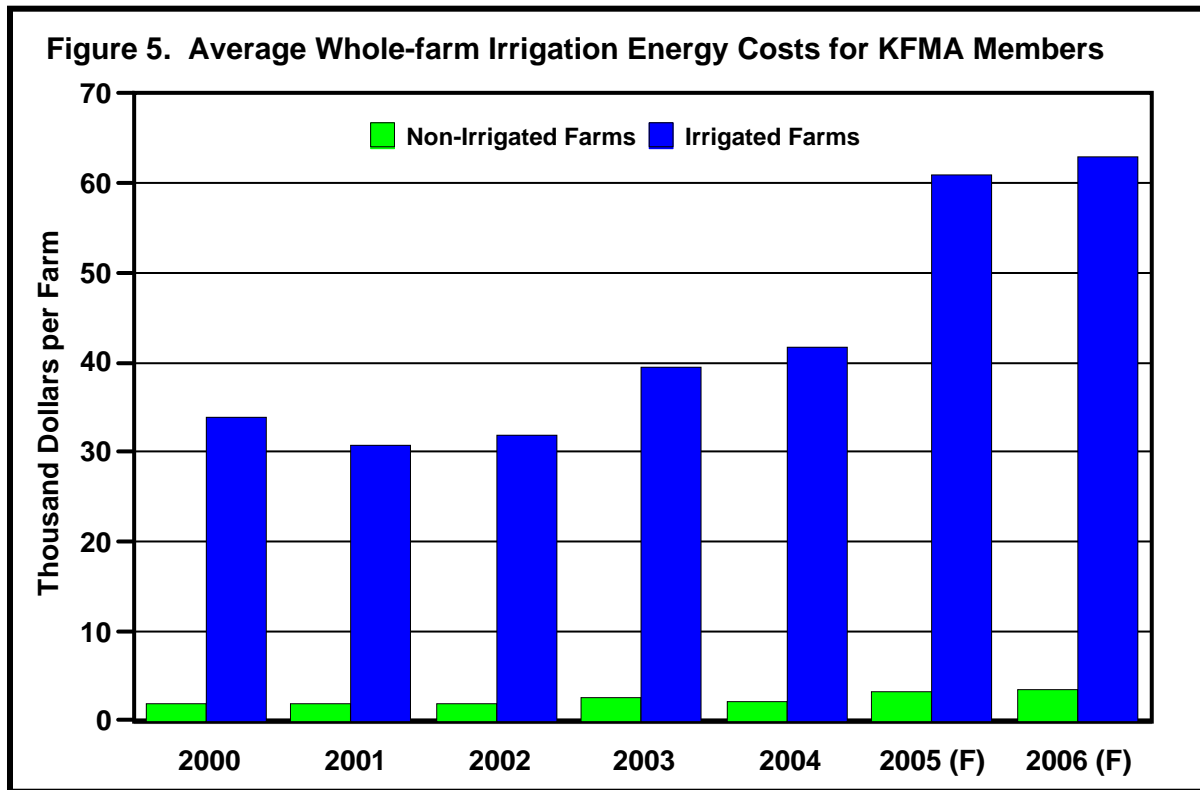


**Table 5. Whole-farm Irrigation Energy Expenses from KFMA Annual ProfitLink Summary**

Year	Non-Irrigated Farms		Irrigated Farms		Weighted Average
	Dollars	Number	Dollars	Number	
2000	\$1,976	1,367	\$33,900	140	\$4,942
2001	\$1,900	1,308	\$30,758	129	\$4,491
2002	\$2,003	1,270	\$31,946	122	\$4,627
2003	\$2,578	1,210	\$39,438	117	\$5,828
2004	\$2,232	1,179	\$41,602	109	\$5,564
2005 (F)	\$3,275	1,179	\$61,039	109	\$8,163
2006 (F)	\$3,374	1,179	\$62,880	109	\$8,409

2005 and 2006 relative to the actual natural gas price in 2004.

'05 chg from '04	\$1,043	46.7%	\$19,437	46.7%	\$2,599
'06 chg from '05	\$99	3.0%	\$1,841	3.0%	\$246
'06 chg from '04	\$1,142	51.1%	\$21,278	51.1%	\$2,846

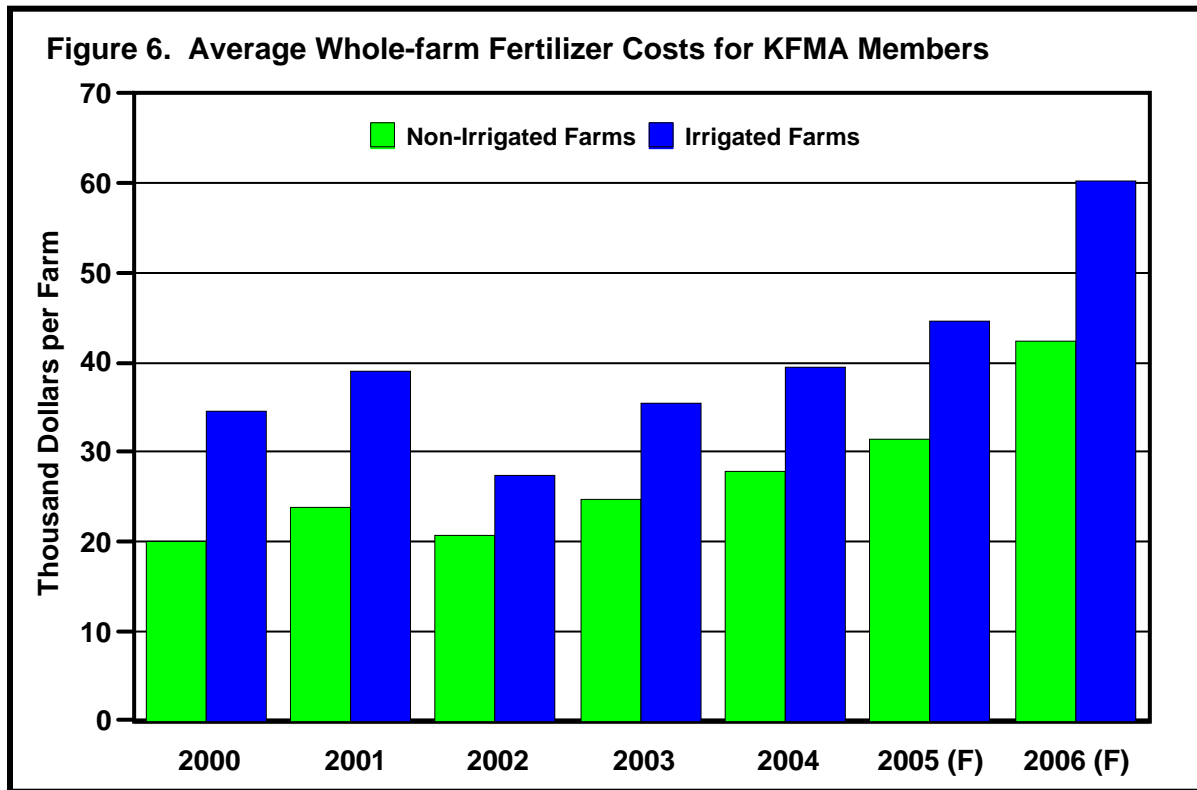


**Table 6. Whole-farm Fertilizer & Lime Expenses from KFMA Annual ProfitLink Summary**

Year	Non-Irrigated Farms		Irrigated Farms		Weighted Average
	Dollars	Number	Dollars	Number	
2000	\$19,999	1,367	\$34,515	140	\$21,348
2001	\$23,806	1,308	\$39,076	129	\$25,177
2002	\$20,705	1,270	\$27,506	122	\$21,301
2003	\$24,638	1,210	\$35,434	117	\$25,590
2004	\$27,737	1,179	\$39,511	109	\$28,733
2005 (F)	\$31,367	1,179	\$44,681	109	\$32,493
2006 (F)	\$42,311	1,179	\$60,271	109	\$43,831

and 2006 relative to the actual fertilizer prices in 2004.

'05 chg from '04	\$3,630	13.1%	\$5,170	13.1%	\$3,760
'06 chg from '05	\$10,944	34.9%	\$15,590	34.9%	\$11,337
'06 chg from '04	\$14,574	52.5%	\$20,760	52.5%	\$15,097



**Table 7. Whole-farm Total Operating Expenses/Acre from KFMA Annual ProfitLink Summary**

Year	Non-Irrigated Farms		Irrigated Farms		Weighted Average
	Dollars	Number	Dollars	Number	
2000	\$112.84	1,367	\$177.05	140	\$118.80
2001	\$120.96	1,308	\$189.83	129	\$127.15
2002	\$112.65	1,270	\$178.80	122	\$118.45
2003	\$118.67	1,210	\$195.40	117	\$125.43
2004	\$127.89	1,179	\$209.88	109	\$134.83
2005 (F)	\$135.30	1,179	\$231.69	109	\$143.45
2006 (F)	\$144.17	1,179	\$244.37	109	\$152.65
Crop acres in '04	1,365	1,179	1,503	109	1,377
'05 chg from '04	\$7.40	---	\$21.81	---	\$8.62
'06 chg from '05	\$8.88	---	\$12.68	---	\$9.20
'06 chg from '04	\$16.28	---	\$34.49	---	\$17.82

\* 2005 and 2006 forecasted expenses are based on changes in prices for 2005 and 2006 relative to the actual prices in 2004.

**Table 8. Percent Energy-Related Costs are of Total Operating Costs by Farm Type**

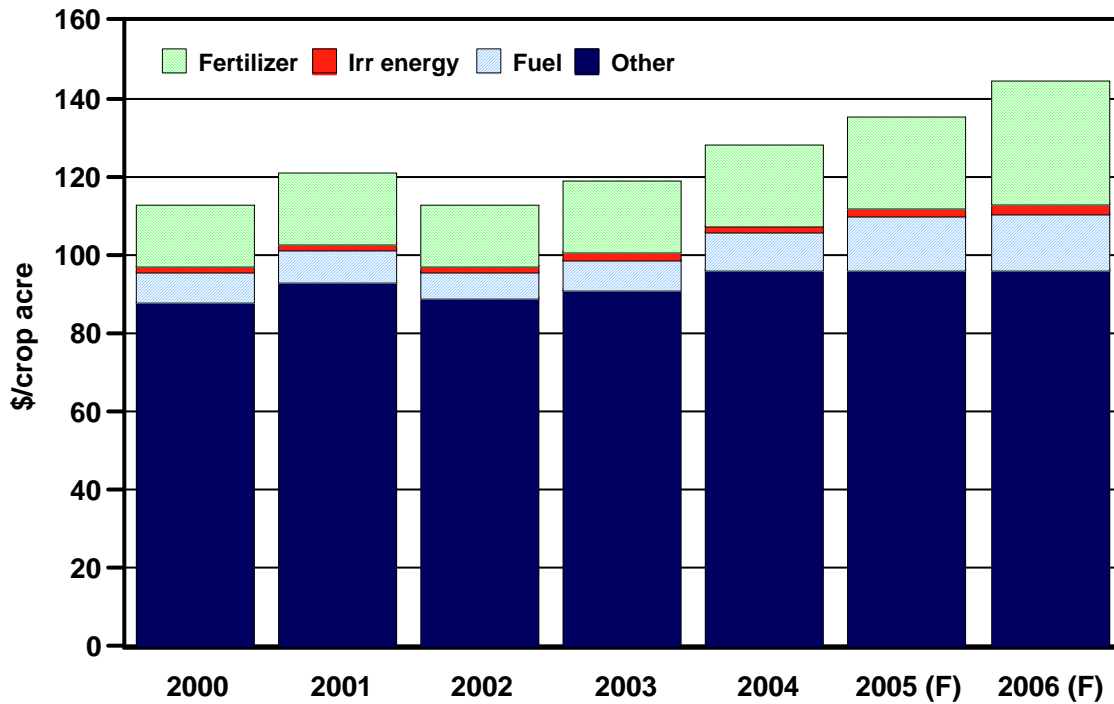
	Non-Irrigated Farms			Irrigated Farms		
	2000-04	2005	2006	2000-04	2005	2006
Fuel and oil	6.8%	9.9%	9.8%	6.0%	7.9%	7.9%
Irrigation energy	1.3%	1.8%	1.7%	12.0%	17.5%	17.1%
Fertilizer & lime	14.7%	17.0%	21.5%	11.9%	12.8%	16.4%
Total	22.8%	28.6%	33.0%	29.9%	38.2%	41.5%

**Table 9. Amount Land Rent would Need to Decrease to Offset Impact of Higher Energy Costs**

Time period	Dryland acres		Irrigated acres		Weighted Average
'05 chg from '04		\$5.72		\$32.89	\$8.62
'06 chg from '05		\$8.44		\$15.60	\$9.20
'06 chg from '04		\$14.16		\$48.49	\$17.82

\* Note: this is the rent per acre of non-irrigated and irrigated land ACRES not the rent per acre for non-irrigated and irrigated FARMS (which include some land of both types).

**Figure 7a. Operating Costs for Non-irrigated Farms in KFMA**



**Figure 7b. Operating Costs for Irrigated Farms in KFMA**

