

Impact of Energy Price Increases on Kansas Non-Irrigated Crop Farms

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Introduction

In December of 2005, Dhuyvetter, Funk, Kastens, and Langemeier analyzed the expected impact on Kansas Farm Management Association (KFMA) farms of energy price increases. Inputs examined on non-irrigated farms included gas, fuel, oil, and fertilizer. The estimated increase in cost per non-irrigated acre from 2004 to 2005 was \$6.33.

The summary below updates the information contained in Dhuyvetter, Funk, Kastens, and Langemeier. In addition, the summary below compares the increases in energy related input cost to increases in seed, herbicide and insecticide, machinery cost, and crop production cost.

Data

Data for 746 farms in the Kansas Farm Management Association (KFMA) with continuous data from 2002 to 2005 were used in this study. To be included in this study, a farm had to be typed as a non-irrigated crop farm for each year of the study. The 746 farms represent approximately 49% of the farms with whole-farm analysis data in 2005.

All expenses are reported on an accrual basis. Crop machinery cost includes repairs, gas, fuel, oil, machine hire and lease, economic depreciation, and an opportunity charge on machinery and equipment investment. Crop production cost includes hired labor, machinery cost, seed, fertilizer, herbicide and insecticide, storage and marketing, insurance, supplies, utilities, and dues and fees.

Production cost is impacted by price changes, technology, and crop mix. Adopting technology (e.g., switching to a reduced tillage system) and changes in a farm's crop mix often change the optimal mix of inputs. It was not possible to disentangle the impacts of price changes, technology adoption, and crop mix changes in the analysis summarized below.

Analysis

Tables 1-2 contain summary information on crop related expenses for non-irrigated farms. On a per acre basis, crop production cost increased \$8.69 from 2002 to 2003, \$8.49 from 2003 to 2004, and \$14.97 from 2004 to 2005. These per acre crop production cost increases represented an 8.27% increase from 2002 to 2003, a 7.46% increase from 2003 to 2004, and a 12.24% increase from 2004 to 2005.

The increase in energy related expenses (Table 2) was a major contributor to the increase in crop production cost. Energy related expenses increased 27.76% from 2004 to 2005. In 2005, fertilizer expense increased by 24.44% and gas, fuel, and oil expense increased by 35.05%. On a per acre basis, approximately 56% of the increase in crop production cost in 2005 was attributable to increases in energy related expenses. The remaining increase in crop production cost per acre was due to increases in seed, fertilizer, herbicide and insecticide, hired labor, repairs, machine hire and lease, storage and marketing, supplies, utilities, dues and fees, economic depreciation, and opportunity charges on machinery and equipment investment.

Summary Points

Increases in energy related expenses represented 56% of the increase in crop production cost per acre in 2005. Increases in energy related expenses increased per acre cost by \$8.36 in 2005 and \$15.46 from 2002 to 2005.

Energy related expenses, on a per acre basis, increased 16.56% from 2002 to 2003, 12.25% from 2003 to 2004, and 27.76% from 2004 to 2005.

Table 1. Major Crop Related Expenses per Acre for Non-Irrigated KFMA Crop Farms from 2002-2005.

Expense Category	2002	2003	2004	2005
<u>Expense per Acre</u>				
Seed	\$12.47	\$13.38	\$14.43	\$17.06
Fertilizer and Lime	\$16.19	\$18.93	\$20.70	\$25.75
Herbicide and Insecticide	\$11.69	\$12.65	\$12.23	\$13.16
Gas, Fuel, and Oil	\$6.83	\$7.91	\$9.43	\$12.74
Machinery Cost	\$43.22	\$45.15	\$49.13	\$54.27
Crop Production Cost	\$105.08	\$113.77	\$122.26	\$137.23
<u>Annual % Change in per Acre Expense</u>				
Seed		7.33%	7.85%	18.19%
Fertilizer and Lime		16.92%	9.30%	24.44%
Herbicide and Insecticide		8.23%	-3.32%	7.55%
Gas, Fuel, and Oil		15.70%	19.31%	35.05%
Crop Machinery Cost		4.47%	8.83%	10.46%
Crop Production Cost		8.27%	7.46%	12.24%

Source: Kansas Farm Management Association 2005 Databank.

Table 2. Energy Intensive Expenses for Non-Irrigated KFMA Crop Farms from 2002-2005.

Expense Category	2002	2003	2004	2005
<u>Fertilizer and Lime</u>				
Crop Expense	\$22,537	\$26,724	\$29,229	\$37,066
Expense per Crop Acre	\$16.19	\$18.93	\$20.70	\$25.75
Annual % Change in per Acre Expense		16.92%	9.30%	24.44%
<u>Gas, Fuel, and Oil</u>				
Crop Expense	\$9,512	\$11,161	\$13,325	\$18,338
Expense per Crop Acre	\$6.83	\$7.91	\$9.43	\$12.74
Annual % Change in per Acre Expense		15.70%	19.31%	35.05%
<u>Total Energy Related Expense</u>				
Crop Expense	\$32,049	\$37,885	\$42,554	\$55,404
Expense per Crop Acre	\$23.03	\$26.84	\$30.13	\$38.49
Annual % Change in per Acre Expense		16.56%	12.25%	27.76%

Source: Kansas Farm Management Association 2005 Databank.