

# AGRICULTURAL POLICY BRIEF

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## Impact of the Recent Surge in Energy Prices on Farm Income, Revisited

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Fuel prices have been in the daily news, for over a year. Crude oil prices have risen from around \$35 per barrel in June 2004 to over \$68 per barrel in August 2005. Natural gas prices, a large component of nitrogen fertilizer, have risen from \$5.25 per mmbtu in March 2004 to over \$9.75 per mmbtu today. These increases in energy costs will be transferred directly to agricultural producers, first in the form of higher gasoline and diesel prices, and then in higher prices for products manufactured from energy products.

In April 2005, the impact of rising energy prices was analyzed using the North Dakota Representative Farm Model. At that time, it was estimated that increased energy prices would cost the average North Dakota producer between \$18/acre and \$22/acre, depending on location and crop production patterns. Table 1 shows the actual prices for 2004, prices in the Spring of 2005 and prices in the Fall of 2005. Since May, gasoline prices have increased about 49%, from \$1.80 to \$2.68 per gallon in August. Similarly, diesel prices have increased 56%, from \$1.42 to \$2.23 per gallon, for the period. Nitrogen fertilizer prices are 8% higher, while phosphorus is about 10% higher.

The impact of higher energy prices on North Dakota producers is shown in Table 2. Net farm income for the state was estimated in May at \$26,293. In August, the estimated net farm income was \$6,387, a decrease of \$19,906. Net farm income for the average profit farm in the RRV (Red River Valley) was estimated at \$52,129 in May is now estimated at \$30,995 using the updated energy prices. The North Central (NC) and West region which had net farm estimates of \$21,393 and \$6,009, respectively, in May, now are estimated to show losses for the year. The South Central (SC) region, which was forecasted

		2004 Actual	May 2005	August 2005
Gasoline	\$/gal	1.45	1.80	2.68
Diesel	\$/gal	1.25	1.43	2.23
<u>Futures</u>				
Gasoline	\$/gal	0.95	1.30	1.98
Heating oil	\$/gal	0.90	1.28	1.86
Natural gas	\$/mmbtu	5.00	8.60	9.75
<u>Fertilizer cost survey</u>				
Nitrogen	\$/ton	350	473	512
Phosphorus	\$/ton	235	250	275
Fertilizer production cost	mmbtu/ton	170	292	332

Source: NDSU Extension Service, Wall Street Select, WTRG Economics

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to show net farm income of \$25,639 in May, is now expected to have net farm income of \$8,004. Since gasoline and diesel prices are highly uncertain in the future, this study includes the alternative scenario of a 15% additional increase in prices. The additional 15% increase in gas and diesel prices would result in further decreases in net farm income in all regions. State net farm income will fall by an additional \$3,132. Net farm income would fall to \$25,077 in the RRV region, \$3,066 in the SC, -\$11,581 in the NC, and -\$13,307 in the West. These estimates assume the higher prices for gasoline and diesel for the entire crop year, while in fact, many inputs were purchased at lower prices during the first half of the crop year. The full impact will be felt during the 2006 crop year. Increases in production costs vary between \$13.87/acre for the NC region and \$10.31/acre for the West. Total per acre increases since 2004 will be between \$34.62 for the RRV and \$28.57 for the SC region.

Table 3 shows the fuel and fertilizer expense of as a proportion of total farm expense. The share for fuel expense has almost doubled in all regions since 2004. In 2004, the state average fuel expense was 7.3%; by August of 2005 that has increased to 12.9%. Fertilizer expense share has increased by 6.8% in the West, 6.3% for the SC, 7.6% in the NC, 3.1% for the RRV, and 5.9% for the state.

Figure 1 shows the historical share of fuel cost of total farm expense for North Dakota producers. Data from 1970 through 2003 are from USDA. Data for 2004 and 2005 are adapted from the North Dakota Representative Farm Model. During the 1970s, fuel costs made up around 15% of total farm expenses. In 1980, fuel expenses rose to almost 20% before peaking in 1982 at 23% of total farm expenses. By 2004, fuel costs, as a share of total farm expenses, had fallen to about 7% of total farm expenses. With the price increase this past year, fuel costs have risen to about 13% of total farm expenses. This is high by recent levels, but much lower than past historical highs.

As mentioned above, the recent increase in fuel prices will substantially reduce net farm income in North Dakota. Producers are caught between rising energy prices and the inability to pass those rising costs to consumers. In the short run, producers need to absorb those costs by transferring funds from other uses to energy expenses. In the long run, energy consumption, or at least the growth in energy consumption, should be limited as producers find new ways to conserve fuel and restrict fertilizer use.

**Table 2. Summary Results for the North Dakota Representative Farm Model, Various Scenarios**

	Net Farm Income	Difference	Per Acre Reduction	% change
<u>RRV</u>				
May	52,129			
August	30,995	21,134	12.42	0.41
Increased	25,077	27,052	15.90	0.52
<u>NC</u>				
May	21,393			
August	-4,368	25,761	13.87	NA
Increased	-11,581	32,974	17.75	NA
<u>SC</u>				
May	25,639			
August	8,004	17,635	10.50	0.69
Increased	3,066	22,573	13.44	0.88
<u>West</u>				
May	6,009			
August	-9,082	15,091	10.31	NA
Increased	-13,307	19,316	13.20	NA
<u>State Average</u>				
May	26,293			
August	6,387	19,906	11.78	0.76
Increased	3,255	23,038	15.07	0.88

	2004-Actual		2005-Fall	
	Fuel	Fertilizer	Fuel	Fertilizer
	-----percent-----			
RRV	5.2	9.7	9.2	12.8
North Central	11.4	10.1	20.4	17.7
South Central	6.7	7.0	11.5	13.3
West	5.7	5.4	10.6	12.2
State	7.3	8.1	12.9	14.0

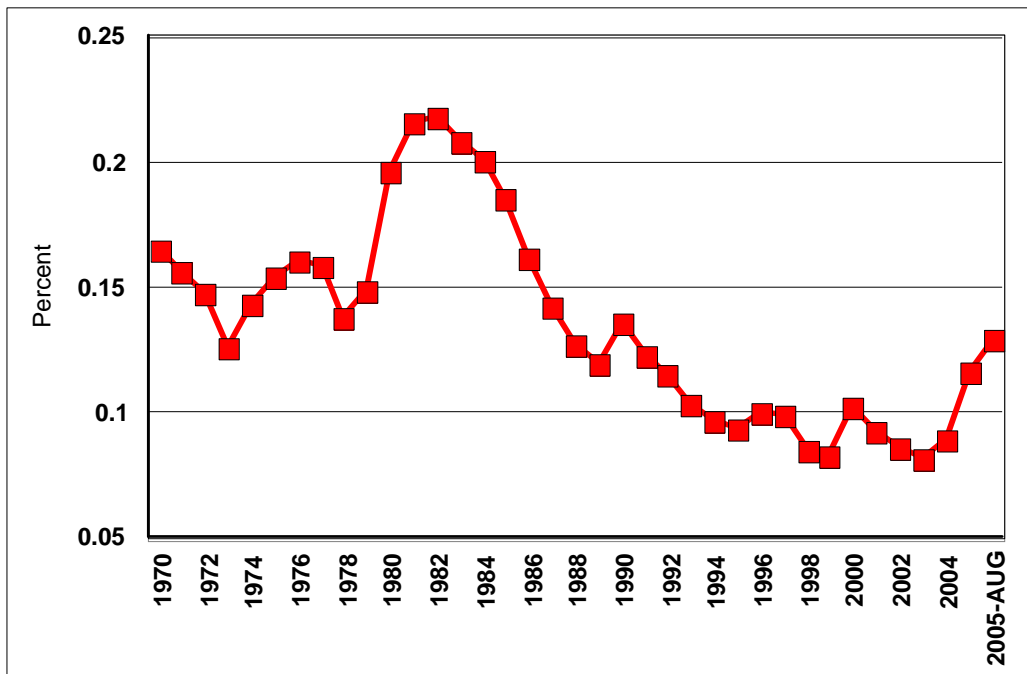


Figure 1. Historical Fuel Cost Shares for North Dakota Agriculture