

Center for Agricultural Policy and Trade Studies North Dakota State University

NEWSLETTER

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Economic Analysis of the Free Trade of Agricultural Chemicals Between the United States and Canada

Richard Taylor, Won W. Koo, and Jeremy Mattson

Canadian and U.S. agricultural chemical markets are segregated by governmental regulation. Chemicals registered and sold for use in one country cannot legally be used in the other, even if their chemical formulation is identical to that of a product that is registered and sold in the other country. Since the two markets are segregated, suppliers who have some degree of monopoly power have the ability to set different prices to maximize their revenue. This behavior is known as third-degree price discrimination. Third-degree price discrimination occurs even though there are no differences in the firm's costs of supplying each market. The seller takes advantages of differences in demand elasticities to maximize profits. Previous studies have shown there are differences in the prices of agricultural chemicals between the United States and Canada. This study estimates the impact of agricultural chemical price differences for producers of durum wheat, spring wheat, winter wheat, barley, corn, soybeans, sunflowers, canola, dry beans, flax, and potatoes in 17 northern states, using updated price data. Price data for U.S. chemicals were obtained from the NDSU Extension Service and price data for Canadian chemicals came from the Saskatchewan Agriculture website.

Table 1 shows the area applied, total chemical costs in 17 states under the current system, total chemical costs under free trade, differences in chemical costs between the U.S. and Canada, and potential per acre savings if producers could purchase lower-priced Canadian chemicals. The following assumptions were made: 1) the price of chemicals in both the United States and Canada would not change under free trade, and 2) producers would choose lower-priced chemicals. Iowa, Illinois, and Minnesota have the highest chemical use. Their aggregate spending on chemicals is \$519 million, \$493 million, and \$347 million, respectively. Producers in Minnesota, Iowa, and Illinois could save \$23 million, \$22 million, and \$21 million annually, respectively, if lower priced Canadian chemicals were available to them. Producers in North Dakota could save \$41 million annually. In terms of cost savings per acre, Montana could have the highest potential cost savings of \$2.67 per acre, followed by North Dakota at \$2.38 per acre, Idaho at \$1.90 per acre, and Wisconsin at \$1.69 per acre. The total savings across the 17 states for the sample 11 crops could be \$178 million or \$1.26 per acre.

The largest total savings would be \$74 million for corn, followed by \$61 million for spring wheat, and \$16 million for soybeans. Per acre savings would be \$4.45 for spring wheat, \$2.46 for barley, \$1.32 for winter wheat, and \$1.31 for corn.

S-Metolachlor (Dual) is the most widely-used chemical in the 17 states, followed by 2,4-D and Dicamba (Banvel). 2,4-D and Dicamba are available from many different companies, and S-Metolachlor is manufactured by Syngenta. Other highly-used chemicals are Bromoxynil (Bronate), Clopyralid (Curtail, Stinger), and Chlorimuron-ethyl (Firstrate). The largest potential cost saving would be Bromoxynil (\$43 million), followed by

	Area Applied	US Cost	Free Trade Cost	Difference	Per Acre Savings
	1,000 acres	1,000 \$	1,000 \$	1,000 \$	\$/acre
Idaho	2,595	45,189	40,266	4,923	1.90
Illinois	22,625	493,281	471,949	21,333	0.94
Indiana	11,703	205,826	194,368	11,458	0.98
Iowa	22,928	519,531	497,737	21,794	0.95
Maine	64	685	685	0	0.00
Michigan	5,107	86,787	82,601	4,186	0.82
Minnesota	16,918	347,121	324,091	23,030	1.37
Montana	6,584	139,845	122,280	17,565	2.67
New York	1,318	25,954	24,665	1,288	0.98
North Dakota	18,160	303,709	262,590	41,119	2.38
Ohio	8,729	156,308	149,844	6,464	0.74
Oregon	1,358	31,123	29,941	1,182	0.87
South Dakota	2,489	43,768	42,096	1,672	0.81
Pennsylvania	12,152	169,015	159,122	9,893	0.81
Washington	4,540	64,325	59,362	4,963	1.09
Wisconsin	3,968	142,685	135,990	6,695	1.69
Wyoming	275	3,085	2,777	308	1.12
Total	141,512	2,778,236	2,600,363	177,873	1.26

S-Metolachlor (\$31 million), Clopyralid (\$22 million), and Glufosinate-ammonium (Liberty) at \$14 million. There are also many chemicals priced lower in the United States than in Canada.

The chemical pricing structure in the United States and Canada has changed during the past few years. Several chemicals which were lower priced in Canada in 2001 are now similar or higher priced today. They include Imazamethabenz (Assert), Atrazine, Bentazon (Basagran), Rimsulfuron (Basis), Cyanazine (Bladex), EPTC (Eptam), Sethoxydim (Poast), and Ethalfluralin (Sonalan). The price differences for some chemicals have widened since 2001; they are Banvel, Bromoxynil, and 2,4-D. The price differences have also narrowed for several chemicals, including S-Metolachlor (Dual), Triallate (Fargo), Glufosinate-ammonium (Liberty), and Clopyralid (Stinger).

For more details, see Agricultural Policy Brief No. 9.

Estimating Efficiency Measures in North Dakota Farms

Kranti Mulik, Richard Taylor, and Won W. Koo

In recent years, North Dakota farmers have faced declining net farm income resulting from low commodity prices and adverse weather conditions. However, some farms continue to be profitable and prosper even in adverse conditions. This study examines the profitability of differently sized farms in North Dakota. The study especially focuses on: (1) whether scale efficiency exists in North Dakota farms and (2) if large-size farms have a cost advantage over smaller farms.

In 2002, there were over 15,000 farms in North Dakota with sales less than \$50,000 (small farms), about 8,000 farms with sales greater than \$100,000 (large farms), and less than 5,000 farms with sales between \$50,000-\$100,000 (medium farms). While the number of large farms has increased since 1987 and has remained stable recently, the number of medium farms has fallen from over 5,000 in 1987 to about 3,000 in 2002. The number of small farms also decreased from over 20,000 in 1987 to just over 15,000 in 1992, but the number has increased steadily thereafter (Figure 1). Large farms accounted for over 80 percent of the total production in 2002, while medium and small farms accounted for a little over 10 percent each. Over the period 1987-2002, the percentage of total production increased for large farms and decreased for the medium and smaller farms.

Results from our empirical analysis indicate that, overall, there is evidence of increasing returns to scale but there is little difference in production efficiency across the farm sizes. Marginal costs and economies of scale are similar between small-, medium-, and large-size farms. Thus, small- and medium-sized farms are just as efficient as the large ones.

These findings do not explain the loss in farm numbers for the middle-size farm category over the last several decades in North Dakota. If per acre profitability does not explain the loss of the middle-size farms, something else must be behind the falling numbers. Several possible reasons include: (1) the middle-size farm does not have the resources for new technology or modern machinery; (2) the middle-size farm may have difficulty transferring assets to the next generation (i.e., it cannot generate family living expenses for more than one family during the transition); and (3) unlike the small-size farm, the middle-size farm has to generate enough income for family living expenses, because the producer does not have time available for non-farm work. On the other hand, large-size farms may not be more efficient in their operation, yet may generate enough income for their living. This may be a main reason for the increasing number of large-size farms in North Dakota.

For more details, see Agribusiness & Applied Economics Report No. 565.

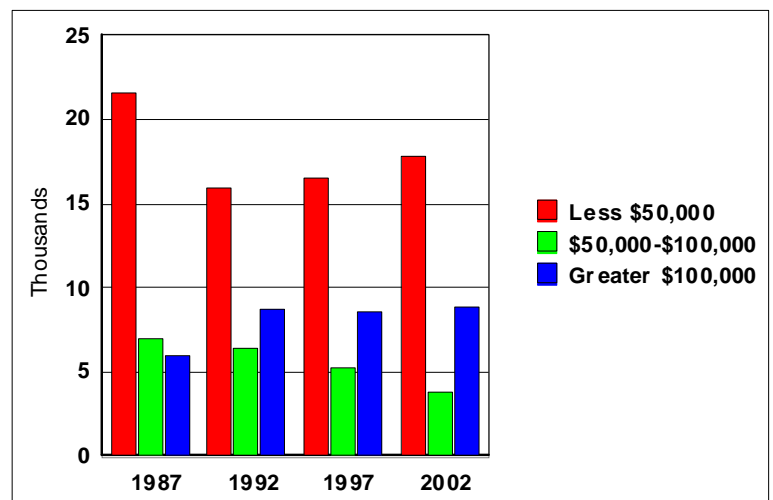


Figure 1. Number of Small, Medium, and Large Farms by Sales Categories in North Dakota, 1987-2002

The Recent Surge in Oil Price Hurts North Dakota Net Farm Income

Richard Taylor and Won W. Koo

Fuel prices have been in the daily news since early June 2004. 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 in 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 consumers, first in the form of higher gasoline and diesel prices, then in higher prices for products manufactured from energy products.

In April 2005, the impact of rising energy prices were 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. Since then, gas price has increased 49% from \$1.80 per gallon in May to \$2.68 in August. Similarly, diesel price has increased 56% from \$1.42 to \$2.23 per gallon for the period.

The impact of higher energy prices on North Dakota producers is shown in Table 1. Net farm income, which was estimated at \$52,129 in May for the average-profit farm in the Red River Valley (RRV), is now estimated at \$30,995 using the current energy prices. The North Central (NC) and West regions, which had net farm estimates of \$21,393 and \$6,009, respectively, in May, are now estimated to show losses for the year. The South Central (SC) region, which was estimated to have a net farm income of \$25,639 in May, is now expected to show a net farm income of \$8,004. An additional 15% increase in gas and diesel prices would result in additional decreases in net farm income in all regions. Net farm income would fall to \$25,077 in the RRV and would decrease to \$3,066 in the SC region. Net farm income in the NC and West regions would decrease to -\$11,581 and -\$13,307, respectively. These estimates assume the higher prices persist 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 since May 2005. Total per acre increases since 2004 will be between \$34.62 for the RRV and \$28.57 for the SC region.

Table 1. Summary Results for the North Dakota Representative Farm Model, Various Scenarios

	Net Farm Income	Difference	Per Acre Reduction
<u>RRV</u>			
May	52,129		
August	30,995	21,134	12.42
Increased	25,077	27,052	15.90
<u>NC</u>			
May	21,393		
August	-4,368	25,761	13.87
Increased	-11,581	32,974	17.75
<u>SC</u>			
May	25,639		
August	8,004	17,635	10.50
Increased	3,066	22,573	13.44
<u>West</u>			
May	6,009		
August	-9,082	15,091	10.31
Increased	-13,307	19,316	13.20

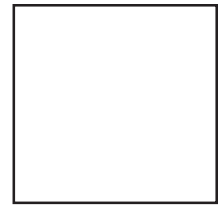
Recent Publications

North Dakota Agricultural Outlook: Representative Farms, 2005-2014, Agribusiness & Applied Economics Report No. 569, July 2005, by Richard D. Taylor, Won W. Koo, and Andrew L. Swenson.

Economic Analysis of the Free Trade of Agricultural Chemicals Between the United States and Canada, Agricultural Policy Brief No. 9, August 2005 (forthcoming), by Richard D. Taylor, Won W. Koo, and Jeremy W. Mattson.

To obtain these publications, visit the CAPTS website (www.ag.ndsu.nodak.edu/capt) or contact Beth Ambrosio by telephone (701-231-7334) or email (beth.ambrosio@ndsu.edu).

North Dakota State University
Dept. of Agribusiness & Applied Economics
P.O. Box 5636
Fargo, ND 58105-5636



Conference Announcement

21st Century Farm Policy: Challenges and Opportunities

October 30-31, 2005
Fargodome - Fargo, ND

U.S. Senator Kent Conrad and Dr. Won W. Koo, Director, Center for Agricultural Policy and Trade Studies, are organizing a conference: "21st Century Farm Policy: Challenges and Opportunities." Conference objectives are:

1. To discuss key issues influencing agricultural policy in the future, including:
 - The World Trade Organization (WTO) and regional free trade negotiations
 - Federal budget deficits
 - Public perceptions of agriculture
 - Market influences, structural changes, and food industry and consumer expectations
2. To identify future farm policy alternatives that:
 - Recognize the changing agricultural policy environment
 - Provide for prosperous and vibrant rural communities
 - Are politically and economically sustainable for producers and rural communities
 - Enhance U.S. agricultural competitiveness
3. To encourage innovative thinking that can effectively navigate changing political and economic influences.

This conference will have a national scope and is intended for agricultural producers, agricultural industry leaders, policymakers, and academicians from all regions in the United States. Due to generous contributions from our conference partners, the registration fee for this conference is only \$60 per person. This fee includes meals (one dinner, two lunches, and one breakfast), refreshments, and conference materials. After September 30th, the registration fee is \$100.

Conference speakers, hotel information, and the registration form can be found on the CAPTS website (www.ag.ndsu.nodak.edu/capts).