Center for Agricultural Policy and Trade Studies
North Dakota State University

NEWSLETTER

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Greetings from the Director

The Center has been very busy with various research and outreach activities. The Center has completed more than 15 research projects and published 23 reports and a dozen refereed journal articles. However, because of a major reduction in funding, the Center's operation has been restructured by reducing the research staff to three full-time and one part-time. The Center's major activities in the coming year will include analyzing impacts of alternative 2007 farm bill proposals on Northern Plains agriculture. Also, we are planning to have a conference on "U.S. Agricultural Competitiveness under Globalization" in either May or October 2007. As director of the Center, I truly appreciate your continued support for the Center and wish you a very Happy New Year.

The Impact of Energy Subsidies on Canola and Other Oilseed Crops in North Dakota

Richard D. Taylor and Won W. Koo

Canola is an excellent crop choice for the production of oil for renewable fuel purposes because it contains a high amount of oil (42%). Compared to soybeans, canola will produce twice as much renewable fuel per acre. Canola is crushed at two major crush plants in the primary growing region and announcements for two new plants have been made to convert canola oil into biodiesel in North Dakota. Together, these plants will require more canola than is currently being produced in the United States. This emphasizes the importance of a federal subsidy which, when paid to producers, will spur additional production of canola for renewable fuel purposes and limit imports from Canada.

North Dakota accounts for about 90% of all the canola produced in the United States. Total canola production value in the state has ranged from $106 million in 1999 to $175 million in 2001, while acreage has varied between 820,000 and 1.5 million acres in the last seven years. Canola production in North Dakota is concentrated in twelve northern counties. The concentration of the state's production in the northern counties increased from about 66% in 2000 to almost 79% in 2005. Plantings of canola in the state decreased by 18% between 2000 and 2005, but the northern counties reduced plantings by only 3% during the same time period, which indicates that canola is a competitive crop in the northern counties, and it may not be competitive in other areas.

Two possible subsidies have been proposed by the Northern Canola Growers Association to increase the production of canola and other oilseeds for biodiesel production. The first proposed subsidy is an energy payment paid to producers of oil crops if that crop is converted to biodiesel. The level of the energy payment would be $0.05 per pound of oil produced for renewable fuel. The second proposed subsidy is an energy tax credit based on the amount of vegetable oil production. The level of the tax credit would be $0.10 per gallon of oil produced.

The proposed energy subsidy of $0.05 per pound of oil produced is paid directly to the producer of the oil crop used in biodiesel production. Canola is about 42% oil while sunflowers and soybeans contain 42% and 19% oil, respectively. That subsidy amounts to about $2.10 per cwt of canola and sunflowers and about $0.54 per bushel of soybeans. It also equals a subsidy of $0.375 per gallon of oil. The $0.05 per pound oil subsidy, or $2.10 per cwt for canola, would increase canola acres planted in North Dakota to 1.36 million and increase net returns to labor and management to from -$11.14 per acre to $12.17 per acre for canola. Sunflower acres would increase by 13% and soybean acres would increase about 16%. Sunflower net returns increase by $7.51

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per acre and soybean net returns increase by $3.17 per acre. Under this subsidy, $48 million would be paid to oilseed producers in North Dakota. Nationwide, the energy payment would be about $215 million, using the Northern Canola Growers Association's assumption that 80% of canola, 25% of sunflowers, and 12% of soybeans would be converted to biodiesel.

The producer response to the proposed energy tax credit is assumed to be the same as a direct subsidy. If producers have no income tax liability, then there would be no benefit from an energy tax credit. A $0.10 per gallon of biodiesel tax credit would equal a subsidy of $0.56 per cwt on canola or sunflowers. For soybeans, the tax credit would equal about $0.28 per bushel. The energy tax credit would increase net returns from -$11.14 per acre to $7.98 per acre for canola producers. They would respond by increasing planted acres by 16.7% from 1.08 million acres to 1.26 million acres. The total tax credit for canola producers in North Dakota would be $20.4 million. Net returns would also increase for sunflower and soybean producers as they would also benefit from the energy tax credit. The total energy tax credit would be $31.2 million for the state.

If the two subsidies were combined, the effective subsidy would be $3.43 per cwt. The impact of the subsidy would be increases in planted area in the state to 1.46 million acres for canola, 1.43 million acres for sunflowers, and 3.71 million acres for soybeans. Total payments would be $52 million for canola, $16 million for sunflowers, and $11 million for soybeans. The total payment to the state would be $79 million. That level of subsidy would provide enough oil crops to produce about 200 million gallons of biodiesel in North Dakota and about 900 million gallons nationwide.

Any subsidy, when directed towards a specific economic activity, will increase the resources directed towards that activity. In the case of these subsidies, resources will be transferred from non-oilseed crops (land) to energy producing oilseeds. In the long run, that transfer will increase production of oilseeds to the point where most benefits of the subsidy will be transferred downstream to the consumers. The processors of biodiesel, under competition from others within the industry, will be pressured to lower their costs by underbidding the food use market for vegetable oil. A portion of the energy payment and energy tax credit could be transferred to processors. Producers of oilseeds would retain part of the subsidy but the share between the two would depend on the elasticities of supply and demand.

Does Size Matter?

Richard D. Taylor and Won W. Koo

The only unchanging aspect of agriculture is that it changes. Agriculture followed the Industrial Revelation which began in England in the 1800s. The main change in agriculture did not began in the United States until the frontier closed in the 1890s. At that time, no further increase in the land base was possible, so production increases were directed towards other efficiency measures. The outbreak of World War I signaled the beginning of the first substantial change in production agriculture. Since then, agriculture has been noted, except for a few years, with over production and low prices.

It is constantly reported in the popular press that we (The United States) must save the family farm. During each election and every new farm bill we hear reports that the "Family Farm" is in dire straits and must be saved. However, no one defines family farm, they assume that everyone understands the meaning. There are many definitions of family farms, but generally a farm must meet four requirements to be classified as a family farm: (1) a majority of the management and labor must be done by the operator and family, (2) close association must exist between the household and the business, (3) managerial control must be exercised by the operator, and (4) family farms must obtain the majority of their income from farming. Most typical family farms are in the USDA sales classes of $100-$250 thousand and $250-$500 thousand for 2005. Farms with less than $100 thousand in sales do not provide enough family living to be classified as family farms, and farms with over $500 thousand in sales typically hire too much outside labor to be classified as a family farm.

A ratio that is useful in comparing operating efficiency is total factor productivity (TFP). TFP is defined as total output divided by total expense. An increase in TFP indicates an increase in efficiency. Total gross production in the United States for the largest size farms (over $1 million sales) was $134.2 billion in 2005 while total expense was $87.5 billion, for a TFP ratio of 1.53, according to data from the USDA's Economic Research Service. Total gross production for the family farm type ($100-$500 thousand sales) was $67.6 billion while total expense was $52.9 billion for a TFP ratio of 1.28. This indicates that for every dollar that the largest size farm spends on expenses it receives a $1.53 return while the family farm returns $1.28. Even though the family type farm is profitable, it is difficult to compete against farms which are about 19% more efficient.

Resources are typically divided into three groups: land, labor, and capital. Balance sheet data are not available from the USDA by size of farms, so several proxies from the income statements were developed to determine if there were differences in resource use by type. Labor is the sum of the expense for contracted labor and wage labor. Fixed capital (F-cap) is total rent paid, property taxes, and interest expense. Variable capital (V-cap) is all of the remaining expenses. Table 1 shows the distribution of U.S. farms by sales, distribution of total production, net farm income (NFI), labor expense, F-cap and, V-cap. Total production is total crop, livestock, and all other farm income, including government payments.

Table 1. Share of United States Total Production, Net Farm Income, Labor, Fixed Capital and Variable Capital for the Years 1991 and 2005, by Farm Size.

	$1,000,000 or more	$500,000 - $999,999	$250,000 - $499,999	$100,000 - $249,999	$50,000 - $99,999	$20,000 - $49,999	Less than $20,000
Number	---------- Percent----------						
1991	0.6	1.3	3.3	10.2	11.8	14.0	58.7
2005	2.0	2.3	4.4	9.3	9.3	20.5	52.2
Production							
1991	25.0	12.7	15.3	22.7	11.3	6.5	6.6
2005	48.7	12.7	12.4	12.1	5.3	4.9	3.8
NFI							
1991	44.5	17.5	16.4	22.8	8.5	2.9	-12.6
2005	63.3	13.7	11.2	8.8	3.4	2.7	-3.0
Labor							
1991	40.5	15.0	14.5	16.0	5.2	3.7	5.1
2005	61.2	11.1	10.4	8.5	3.8	2.8	2.3
F-cap							
1991	14.1	11.2	16.4	27.3	10.9	6.7	11.6
2005	30.5	14.4	15.6	16.0	7.1	6.8	8.7
V-cap							
1991	20.0	11.8	15.6	23.3	13.1	7.6	8.5
2005	42.4	12.7	13.5	13.9	6.1	5.5	5.9

Source: U.S. Department of Agriculture, Economic Research Service

Since 1991, the share of family type farms has remained about the same: 13.5% of total U.S. farms in 1991 and 13.7% in 2005. The farms near the lower end in sales have decreased in number while the number of farms near the upper end has increased. The number farms with over $1 million in sales increased 245%, from 0.6% of the total in 1991 to 2% in 2005, while the farms in the $500 thousand-$1 million sales class increased 69%. Total farm numbers in the United States has remained around 2.1 million during this time period.

The largest farms produced 25% of total U.S. agricultural production in the 1991 and about 49% in 2005. Production share for family type farms fell from 38% of total U.S. agricultural output in 1991 to 25% in 2005, while their numbers remained about constant. The share of NFI for the largest size farms increased from 45% in 1991 to 63% in 2005. The share of NFI for the family type farm fell from 39% in 1991 to 20% in 2005. It is obvious that even though the number of family farms remained constant, the financial performance of those farms fell behind larger farms.

One of the reasons for this change in shares may be more efficient use of resources by larger farms. The largest farms produced about 49% of total U.S. agricultural output while using 61% of labor, 31% of F-cap, and 42% of V-cap. The family type farms produced 25% of U.S. output while using 19% of labor, 32% of F-cap, and 37% of V-cap. While the largest farms used a larger share of labor than the family type farms, they used a substantially smaller share of F-cap and V-cap. Comparing expense shares with NFI indicates a wider spread. The largest farms had 63% of U.S. net farm income, used 61% of the labor, 31% of the F-cap and 42% of the V-cap. The family type farms had 20% of U.S. net farm income, used 19% of the labor, 32% of the F-cap, and 37% of the V-cap.

Figures 1 and 2 show the trends in NFI, labor expense, F-cap and V-cap expenses for the largest size and family type farms. The share of labor use for the largest farms follow similar trends with NFI while the share of labor use for the family type farm is substantially less than NFI income, indicating a large portion of labor for the family type farm is done by unpaid owner and family labor. The share of F-cap is much less for the largest size farm. During this time period, the share of F-cap is about 27% less than the share of NFI for the largest farms. The share of F-cap is 6% greater than the share of NFI for the family type farm. The share of V-cap is about 17% less than the share of NFI for the largest size and 0.04% greater for the family type farm. For the United States, smaller family farms seem to be at a disadvantage when compared to larger farms, based on these efficiency measures. If this is true, it will be very difficult to save the “Family Farm.”

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Recent Publications

Dynamics in the Macroeconomy and the U.S. Agricultural Trade Balance, by Jungho Baek and Won W. Koo, Agribusiness & Applied Economics Report No. 596, December 2006.

Empirically Analyzing the Impact of U.S. Export Credit Programs on U.S. Agricultural Trade, by Paul Rienstra-Munnicha, Kranti Mulik, and Won W. Koo, Agribusiness & Applied Economics Report No. 592, December 2006.

To obtain these publications, contact Carol Jensen by telephone (701-231-7441) or email (cjensen@ndsuext.nodak.edu) or download them from this website: www.ext.nodak.edu/agecon

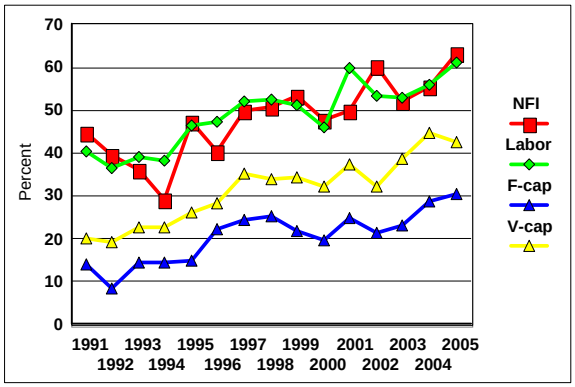

Figure 1. Net Farm Income, Labor Expense, Fixed Capital, and Variable Capital Shares for U.S. Farms With Sales Over $1 Million.

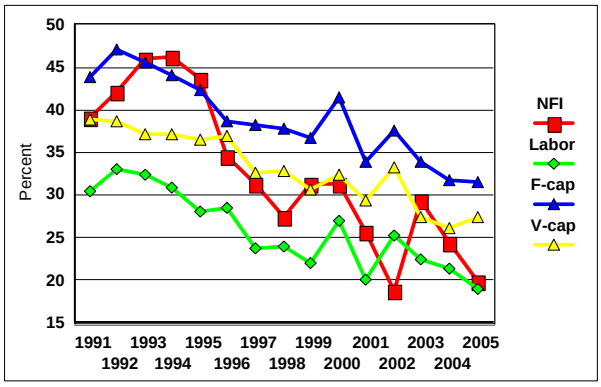

Figure 2. Net Farm Income, Labor Expense, Fixed Capital, and Variable Capital Shares for U.S. Farms With Sales Between $100 Thousand and $500 Thousand