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Center for Agricultural Policy and Trade Studies  
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**AGRICULTURAL POLICY BRIEF**

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**An Economic Analysis of the Revenue Loss Assistance Program**

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The economic conditions under which the 2012 farm bill is being discussed are substantially different from the previous farm bills. In 2002, corn prices averaged \$2.32/bu with a federal budget surplus. In 2008, corn prices averaged \$4.06/bu with a federal budget deficit of \$410 billion. Today corn prices average \$6.60/bu with a federal budget deficit of \$1,101 billion. Prices of other commodities, including wheat, soybeans, and rice also have increased significantly since 2008. In addition to high commodity prices, farms are facing operating costs which have increased by 64% since the 2002 farm bill and 20% from the 2008 farm bill. The high commodity prices along with the large federal deficit could make it difficult to formulate a new farm bill.

There are four main components under the commodity title of the previous farm bill. They are the Marketing Loan program, Direct Payments, Counter-Cyclical Payments (CCP)/Average Crop Revenue Election Program (ACRE), and Supplemental Revenue Assistance Payment Program (SURE). The Marketing Loan program provides a price floor for all program commodities. Direct payments provide a fixed payment to producers regardless of production or the price level. Both the CCP and ACRE provides counter cyclical payments based on commodity prices or revenue, respectively. The SURE program is a disaster program which pays for crop losses in addition to federal crop insurance.

A farm bill alternative entitled "The Revenue Loss Assistant Program (RLAP) was developed by Senator Kent Conrad's office. The purpose of the RLAP is to provide better income protection and protection from a shallow loss. A shallow loss is a decrease in farm revenue stemming from a gradual drop in commodity prices before the revenue levels within federal crop insurance can be determined. Typically, farmers will insure their crops at a 75% of the expected revenue. Then, the RLAP will cover 65% of the revenue loss uncovered by crop insurance. Since recent prices are much higher than target prices, the target prices provide little protection for the farmers. If a shallow loss would occur under the current legislation; federal crop insurance revenue protection would decrease substantially before any other government program would be triggered.

**SUMMARY OF THE REVENUE LOSS ASSISTANCE PROGRAM**

The RLAP covers all planted and prevented planted acres of eligible crops. Eligible crops are

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*\*This empirical analysis was prepared for Senator Conrad and the North Dakota Farmers Union.*

wheat, corn, grain sorghum, barley, oats, rice, soybeans, upland cotton, minor oilseed, peanuts, and pulse crops. Under the RLAP, payments would be made based on Actual Production History (APH); current production and the higher of the target price or a 5-year Olympic national average price. If market price is lower than either target or the national average price, RLAP payments would be triggered. The national average price would be determined by the Secretary of Agriculture for the first four months of the marketing year for each crop. The RLAP requires the purchase of a minimum catastrophic loss level of crop insurance coverage for eligibility to participate in the program. The proposed program would provide revenue protection for the farmers at 65% of the difference between 88% of the historic revenue and the sum of: the actual crop revenue plus other revenue or 65% of the difference between 88% of the historic revenue and 75% of the historic revenue. If market price fell below target prices, CCP payments would be made at the 75% level. The marketing loan program is also included in the RLAP. Federal crop insurance protection is based on expected commodity prices at harvest. When current and expected prices remain high, revenue crop insurance provide adequate protection for producers. If prices decrease during the marketing year, the price level in federal crop insurance will also decrease, reducing the effectiveness of federal crop insurance. Since the RLAP is based on a National Average Price and not expected harvest price, its protection level would not decrease if prices fell during a single marketing year. The RLAP benefits would decrease, however, if prices decreased for multiple years.

**Table 1. Calculation of Payments Under the RLAP**

<u>Crop Insurance</u>		<u>RLAP</u>	
Expected Price*	$P^e$	National Average Price <sup>#</sup>	$P^n$
APH Yield	$Y^e$	APH Yield	$Y^e$
Market Price	$P^m$	Market Price	$P^m$
Actual Yield	$Y^a$	Actual Yield	$Y^a$
CAT Insurance Coverage		RLAP Coverage	
CAT= $P^e * Y^e * 75\%$		RLAP= $((P^n * Y^e) - (P^m * Y^a + \text{Ins Payment})) * 88\% * 65\%$	
Insurance Payment = CAT- $P^m * Y^a$			

\*Determined by RMA

#Calculated by Secretary of Agriculture

Table 1 shows the calculations for the RLAP proposal. RLAP covers 65% of the difference between the National Average Price times APH yield and Actual Revenue plus crop insurance payments. The expected price and National Average Price are not the same. The former is determined before planting by the RMA, while the later is calculated as a 5-year Olympic average of the first four months of each marketing year by the Secretary of Agriculture.

## METHODOLOGY

The North Dakota Representative Farm Model is used to analyze the economic effects of the RLAP on farm income and protection level from risk stemming from market prices and crop yields. The model is a stochastic simulation model designed to analyze changes in farm income under alternative market conditions and farm policies for ND farmers. The model projects average net farm incomes, debt-to-asset ratios, cash rents, and cropland prices for representative farms producing six major crops: wheat, barley, corn, soybeans, canola and sunflowers. The

model is linked to the FAPRI and North Dakota econometric simulation models, and it uses the prices of the crops generated from these models. The base model assumes an average trend yield based on historical data and average predicted prices received by farmers based on the historical relationships between the national prices and North Dakota prices. In addition, macro variables (GDP growth rate and exchange rate), trade policies, and agricultural policies are incorporated into the model.

The model has 24 representative farms: six farms in each of the four regions of North Dakota. These regions are the Red River Valley (RRV), North Central (NC), South Central (SC), and Western (West). The farms in each region are representative of the average, high, and low-profit farms and small, medium, and large-size farms enrolled in the North Dakota Farm and Ranch Business Management Education Program. This study is based on farms under the profit category for state level. The model consists of four components: net farm income, debt-to-asset ratio, land price and cash rent.

The Model uses the software program @Risk for stochastic simulation. All yield variables are assumed to have a normal distribution with the mean value and standard deviation. Likewise, the prices of commodities are assumed to be log-normal distribution. The model is simulated 3,000 times, which allows the output to develop stable means and distribution.

## **DATA USED FOR THE STUDY**

The North Dakota commodity prices for crops are obtained from the North Dakota Farm and Ranch Business Management Association reports. The 5-year Olympic national price was calculated for each crop from the data obtained from the USDA. Variation in commodity prices, (the standard deviation) was calculation from national marketing year price for each crop. Those standard deviations were used in the model to estimate potential revenue variations.

Crop yields in each region were obtained from the North Dakota Farm and Ranch Business Management Association reports. The standard deviations of the yields were estimated from the data. Other data needed for the model are obtained from the North Dakota Farm and Ranch Business Management Association (farm record system data).

Two models were estimated for this study and two different scenarios for each model; Base model with current farm legislation (Current) and a model with the RLAP. Each model was then run under a 10% shallow loss scenario to determine the impact of the shallow loss on net farm income under the current legislation and the RLAP.

## **RESULTS**

### **Farm Income Under the Current Farm Legislation and RLAP**

Table 1 presents average net farm income under the current farm bill and RLAP proposal. The net farm incomes are similar under the two programs; it is \$292 thousand under the current farm



bill, while \$283 thousand under RLAP proposal. However, the distributions of the farm income are substantially different. The current farm program has a traditional bell-shaped distribution of the net farm income, while the RLAP removes the lower observation with payments made to producers due mainly to additional protection under RLAP as shown in Figure 1.

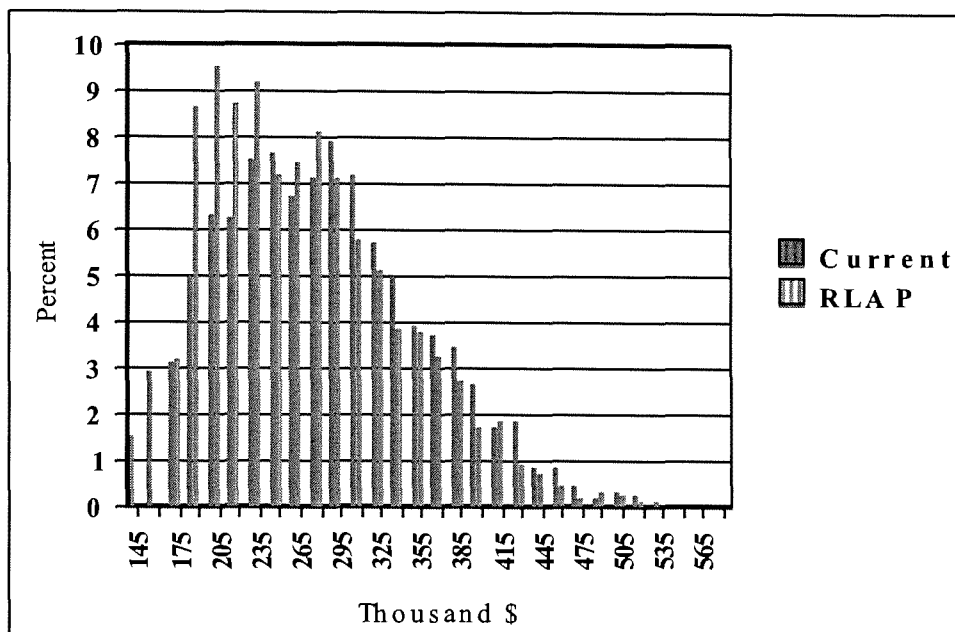
Government spending under the RLAP is less than under the current program because the saving from the removal of the direct payments under the RLAP are large enough to offset the additional payments made by the RLAP. Market price distribution based on historical data indicates that the probability for market price lower than either the target price or the National Average Price is 27%. Under RLAP, payments are made only 27% of the time. On the other hand, direct payments are made 100% of the time. Under recent price levels, CCP payments are never made since the target price has been lower than market price for the last few years.

Standard deviations in Table 2 represent risk stemming from variations in market prices and crop yields. The current program was designed to protect producers from changes in farm income stemming from uncertainty in prices through CCP and prices and crop yields through SURE, and ACRE programs. However these programs have not been effective since the target prices are lower than market prices in the last several years. On the other hand, RLAP provides 65% of the revenue losses uncovered by crop insurance. Thus, the standard deviation under the RLAP is smaller than that under the current farm program, indicating that the RLAP provides better protection than the current program.

Under the shallow loss scenario, the average net farm incomes are similar between the 2008 farm bill and RLAP. However the standard deviation under RLAP is much smaller than the 2008 farm bill, indicating that RLAP provided much better protection for the average net farm income than the current farm bill under the shallow loss scenario.

**Table 2. Farm Income, Average Payments, and Payments Frequency Under the Current and Shallow Loss Scenarios**

		2008 Farm Bill	RLAP
<b>Base Scenario</b>			
Net Farm Income	thousand (\$)	292.5	282.9
Average Payment	thousand (\$)	15.5	5.9
Payment Frequency	(%)	100	27
Standard Deviation	thousand (\$)	88.2	80.7
<b>Shallow Loss Scenario</b>			
Net Farm Income	thousand (\$)	234.4	236.2
Average Payment	thousand (\$)	15.5	17.3
Payment Frequency	(%)	100	53
Standard Deviation	thousand (\$)	79.4	62.0



**Figure 1. Probability Distributions of Average Net Farm Incomes Under the Current Farm Legislation and the RLAP**

Figure 2 shows the level and frequency of payments made under RLAP. The payments are made 810 out of 3000 observations (27%), implying that market prices of commodities are lower than the national average prices at 27% of the time. Average payment is \$5,910 under this program. Direct payment averages \$15,455 per year. While the average payment under the RLAP is less than under the current legislation, there are several cases where large payments are provided. Payments of over \$30 thousand occur very infrequent, less than 1% of the time. Payments over \$15 thousand occurred 5% of the time. The largest payment made is \$36 thousand

### Farm Income under Shallow Loss

For this scenario, it is assumed that there is a 10% decrease in commodity prices in the current marketing year. In this case crop insurance payments would be reduced by approximately 10%. As shown in Table 2, the net farm income under farm current program is lower than that under the RLAP. In addition, the standard deviation of the income under the RLAP is much smaller than that under the current program. These clearly indicate that the RLAP provides better protection to producers from a decrease in market prices during the marketing year.

Figure 3 shows net farm income under the current legislation and the RLAP under an assumption of a 10% shallow loss scenario. The average payment under the RLAP is \$1,852 higher than the current legislation which indicates that the cost of the RLAP proposal is slightly higher than the cost of the current legislation. Average net farm income under the current legislation is \$234 thousand compared to \$236 thousand under the RLAP proposal (Table 2).

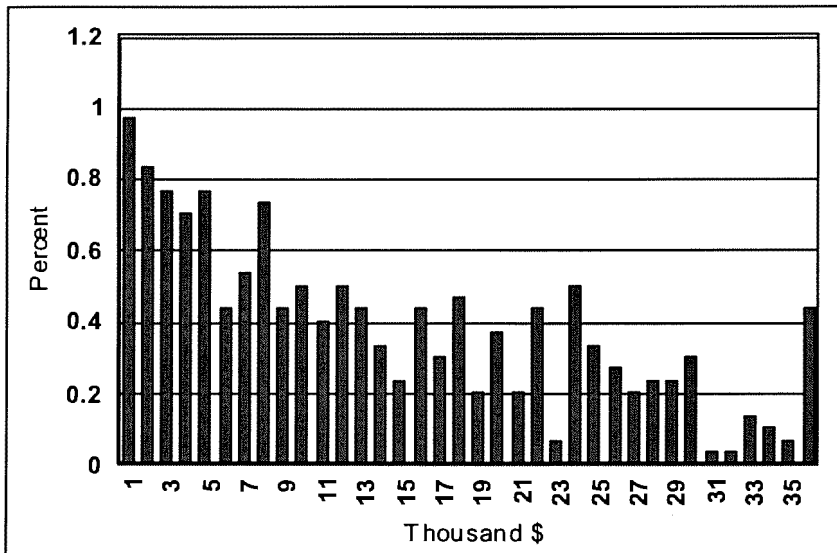


Figure 2. Payment Level and Frequency for the Revenue Loss Assistance Program

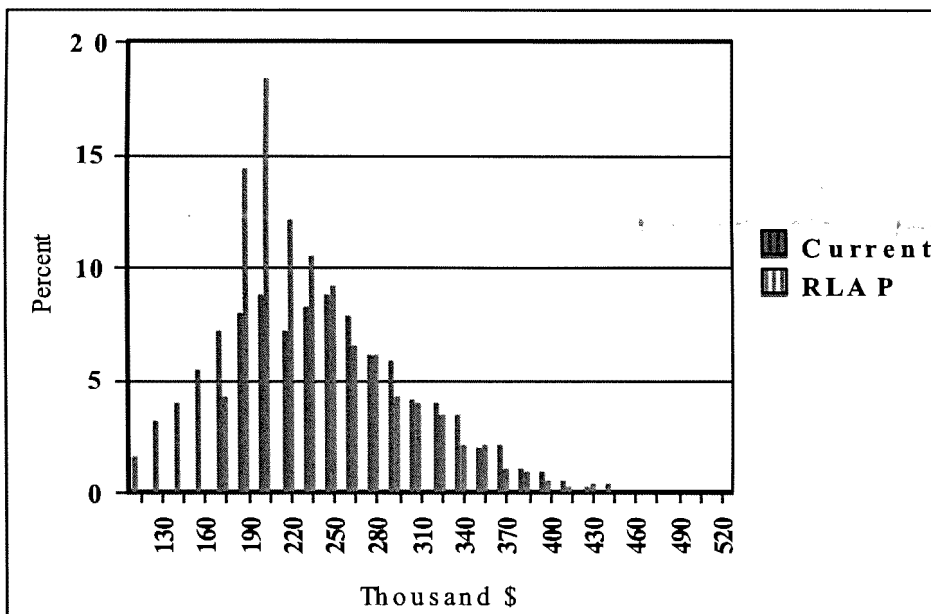


Figure 3. Net Farm Income Under the Current Legislation and RLAP Proposal With A 10% Shallow Loss Scenario.

Table 3 shows the National Average Prices, market prices, shallow loss prices and target prices. Under the shallow loss scenario, prices used in the simulations are 10% less than the National Average prices. Because of the lower price levels, federal crop insurance revenue protection drops by 10%. Approximately 65% of the revenue reduction is covered by the RLAP. The prices under the 10% shallow loss scenario are still higher than the current target prices, implying that CCP payments under the current legislation are not triggered. The only payment made under the current program is direct payments.

		National Average Price	Market Price	Shallow Loss Price	Target Price
Spring Wheat	\$/bu	8.28	8.35	7.45	3.92
Durum Wheat	\$/bu	10.11	9.05	9.10	3.92
Barley	\$/bu	5.49	5.61	4.94	2.24
Sunflower	\$/cwt	30.92	27.93	27.83	10.10
Soybean	\$/bu	11.76	11.4	10.58	5.80
Corn	\$/bu	5.76	5.61	5.18	2.63
Canola	\$/cwt	23.27	23.50	20.94	10.10

Figure 4 shows the level and frequency of payments made with RLAP under the shallow loss scenario. RLAP payments are made 1598 times out of 3000 observations (53%) compared to 27% under current prices. Average payment is \$17,307 under RLAP. Direct payments average \$15,455 per year. While the average payment under the RLAP is slightly greater than under the current legislation, large payments over \$57 thousand are provided 1% of the time. Payments over \$35 thousand occurred 9% of the time and the largest payment made under the shallow loss scenario was \$63 thousand.

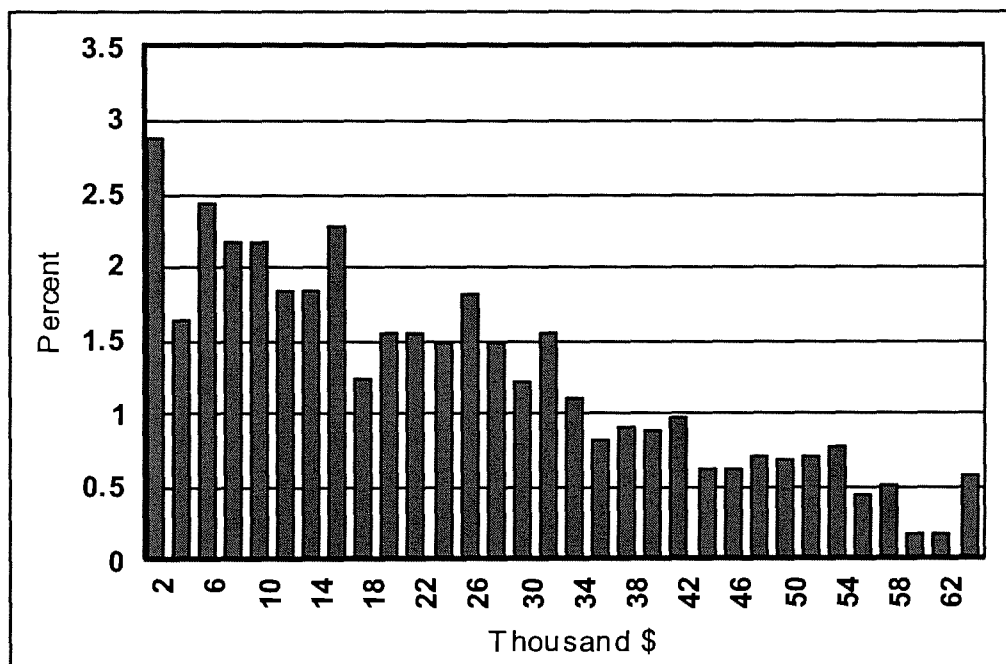


Figure 4. Payment Level and Frequency for the Revenue Loss Assistance Program Under the Shallow Loss Scenario



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## **SUMMARY and IMPLICATIONS**

The RLAP is simpler in terms of operation of the program and easier to understand than the current farm legislation since the program eliminates two components of the 2008 farm bill (Direct payments and ACRE). This study reveals that average farm income under the RLAP is similar to the 2008 farm bill. However, the RLAP provides better revenue protection with less expenditure than the current legislation because of the removal of the direct payments. RLAP provides revenue protection under a shallow loss, but the cost of the revenue protection is much higher. Also included in the RLAP is a quality provision which would provide some protection for producers from quality discounts.

The goal of any farm legislation is to provide income protection for producers. RLAP provides better revenue protection than the previous legislation with less expenditure. However under the current federal budget deficit the goal is constrained by the government expenditure of the program. Currently, agriculture is experiencing a period of high prices, high incomes and general prosperity. However, those high prices lead to rising production costs. History tells us as the commodity prices softens production costs generally do not. Farm legislation should adequately protect producers from the uncertain conditions.