

**Average Farm Prices
Received By Iowa Farmers**

	Dec 1994	Nov 1994	Nov 1993
		\$/Bushel	
Corn	2.04	1.97	2.65
Soybeans	5.33	5.33	6.63
Oats	1.33	1.40	1.58
		\$/Ton	
Alfalfa	81.00	79.00	101.00
All Hay	78.00	76.00	97.00
		\$/Cwt.	
Steers & Heifers	71.10	67.60	71.20
Feeder Calves	76.80	75.00	87.40
Cows	37.20	36.80	43.80
Barrows & Gilts	31.20	29.30	43.90
Sows	21.00	20.60	31.60
Sheep	37.10	33.70	31.90
Lambs	66.90	72.50	65.50
		\$/Lb	
Turkeys	0.42	0.45	0.41
		\$/Dozen	
Eggs	0.52	0.51	0.52
		\$/Cwt.	
All Milk	12.50	12.60	13.80
		\$/Head	
Milk Cows	NA	NA	1,140

Iowa Farm Income Indicators

	1994	1993	1992
	Million Dollars		
Crop Cash Receipts			
Jan - Aug Total	2,001	2,716	2,735
Livestock Cash Receipts			
Jan - Aug Total	3,587	3,846	3,700

significantly smaller in normal years. For example, for the 1994 corn crop, CARD estimates that the first five months of the 1994/95 market will generate an average corn price of \$2.08 per bushel. However, the 12 month average price is projected to be \$2.15 per bushel, \$0.07 per bushel higher. This means that the deficiency payment rate for the 1994 crop will be \$0.07 per bushel lower because the 12 month price is used instead of the 5 month price. The 1993 legisla-

tion did limit the amount that the deficiency payment rate could be reduced by switching from the 5 month price calculation to the 12 month calculation. For corn and sorghum, this limit was set at \$0.07 per bushel. Therefore, even if the 12 month price turned out to be \$2.20 per bushel in the above example, the deficiency payment rate would still only be reduced by \$0.07 dollars per bushel.

One other change that will take effect with the 1994 crop is the timing of deficiency payments. This change affects only corn and sorghum. Advanced deficiency payments are still made at the time of sign-up. However, midterm deficiency payments for corn and sorghum which are typically made in March of the year following the harvest will be reduced in two ways. First, deficiency payments will be reduced because an estimated 12 month price calculation will be used as described above. Second, only 75 percent of the estimated payment will be paid in March. The remaining 25 percent will not be paid out until September when the actual 12 month price is determined. This shifts 25 percent of midterm cash payments to producers from March to September, delaying this cash flow for producers.

CARD/FAPRI Analysis

The Budgetary and Resource Allocation Effects of Revenue Assurance: Summary of Results

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One of the more intriguing alternatives under consideration for the 1995 farm bill is the "Iowa Plan." This idea originated with a group of Iowa's farm and commodity organizations. It is receiving increased attention from national farm organizations, academics, and politicians. The basic premise is very simple. Rather than the current mixture of target prices, disaster payments, set-aside provisions, and crop insurance, the government would underwrite a program that guarantees producers a certain percentage of recent revenues. The idea has much intuitive appeal because farmers (and their bankers) would be assured of a certain revenue figure regardless of what happens to prices or yields.

Because current programs often result in large deficiency payments when yields are also high, and low deficiency payments in drought years, there is a sense that money arrives when it is not needed and fails to arrive when it is needed. Consequently, it appears possible that with revenue assurance the government might cut its costs while improving the welfare of farmers.

With these ideas in mind, CARD has recently begun an in-depth analysis of the Iowa Plan. The first part of this project has been completed and results are now available. The paper is CARD Working Paper 95-WP 130 "The Budgetary and Resource Allocation Effects of Revenue Assurance" by David A. Hennessy, Bruce A. Babcock, and Dermot J. Hayes. Please refer to that paper for more details of the analysis. Here we summarize some of its more important findings.

The Importance of Contract Details

Before one evaluates the impact of revenue assurance, detail is required on exactly how the program would be implemented. However, before policymakers can agree on the details, they need to know more about the likely impact of the proposal itself. In an attempt to get around this "catch-22" situation, our first look at the program is to examine how a representative Iowa corn-soybean farmer would respond to various contract specifications. One advantage of this farm-level focus is that we have excellent information on how yields and prices have moved over time as well as on how rotations influence yields and costs. Thus, we can match up details about the representative farm with details about the revenue assurance program. A second advantage of this farm-level approach is that we can get an accurate idea of what alternative revenue assurance programs will cost and the magnitude of the associated program benefits.

Contract Details

(a) Should revenue assurance be offered on a whole farm level, or should it be offered on a crop-by-crop basis?

One can make good intuitive arguments for either approach and both are compared here.

(b) Should county average yields or farm specific yields be used when calculating revenue?

There is a trade-off between the accuracy of the program and the amount of bureaucracy required to

run it. We compare the government costs and benefits to producers of both programs.

(c) What percentage of expected revenue should the program assure?

The answer depends in part on how much the government can spend and the level of expected benefits at the different assurance levels. We ran the numbers for 70, 80, 90, and 100 percent revenue assurance, but report only on the 80 and 100 percent options.

(d) Should revenues be calculated based on what the farmer actually plants or on what has been grown historically?

Here the answer is less straightforward. Using actual plantings would cause some producers to adopt high-risk crops and cropping practices, and consequently the program itself would distort the market. Our sense is that revenue assurance was proposed to remove market disruptions and, consequently, we used historical plantings to calculate revenues. Note however, that we do use actual (simulated) yields and prices to calculate per-acre revenues.

(e) How should producer benefits be measured?

Revenue assurance and deficiency payment schemes are put in place to reduce the amount of risk associated with farming. If risk were not an issue, the government could simplify things greatly and merely write checks. The way we incorporate the effect of risk is as follows: We calculate the amount of money typical producers would accept for *certain* in exchange for the *risky* outcome they might otherwise face. For example, suppose a farmer expects to make an average of \$50,000 per year raising hogs, but would be just as happy making \$45,000 per year raising hogs if all the revenue uncertainty associated with raising hogs were eliminated. Then we can say that the certainty equivalent of a \$50,000 per year hog operation is \$45,000. Here \$50,000 is the "expected revenue" and \$45,000 is the "certainty equivalent" returns.

The Illustrative Farm

We chose a 500-acre corn-soybean farm in Iowa's Sioux County. Results are presented for two producers who vary according to the level of risk they wish to face. The less risk averse producer is more willing to trade increased risk for increased expected returns than the more risk averse producer. This trade-off is accomplished by moving away from the benefits of a corn-soybean rotation towards a rotation that

emphasizes the program crop, corn. At first glance it would seem that corn is actually less risky than soybeans because of government subsidies, but corn yields and corn prices are more variable than soybean yields and prices, and crop diversification leads to substantial decreases in the variability of farm returns.

The farm is enrolled in the target price program and both types of producers are assumed to purchase federal crop insurance. Expected harvest time sales prices are \$2.21/bu for corn and \$6.17/bu for soybeans. Base yield is 112.1 bushels/ac. Expected yield this year is 137.6 bu/ac when corn follows beans and 124.5 bu/ac in continuous corn. We used production costs estimated by Iowa State University Extension farm management specialists.

Results

Table 1 presents estimates of the effects of moving from the present program to a free market and to revenue assurance. The basic assumption behind these results is that the producer chooses acreage to maximize certainty equivalent returns. Under the current program, the proportion of acreage devoted to corn depends on the assumed level of risk aversion. The less risk averse producer plants significantly more corn than soybeans and the more risk averse producer essentially plants under a corn-soybean rotation. Only farm level revenue assurance results are presented in Table 1. Revenue assurance results based on county average revenue are provided in the full study.

Under the free market option and all the revenue assurance options, the producer finds that a corn-soybean rotation is optimal. Thus, the first result is that for this farm, revenue assurance results in the same acreage allocation as would occur under the free market scenario. That is, there are no distortionary effects of revenue assurance. There are two distortionary effects of the current program. First, productive land is idled: 22 acres for the less risk averse producer and 17 acres for the more risk averse producer (who has less corn base). Second, for the less risk averse producer, corn deficiency payments induce greater production of corn. That is, this farmer finds it optimal to "farm the program" by increasing land planted to corn.

Expected government costs of revenue assurance are substantially less than under the current program. For example, government costs under 80 percent crop specific assurance are reduced by 92 percent for the less risk averse producer and by 90 percent for the more risk averse producer. Under 100 percent crop specific assurance, costs are 55 percent less than the current program for the less risk averse producer and 44 percent less for the more risk averse producer. The cost reduction is even greater under whole farm assurance. Producer certainty equivalent returns also fall under revenue assurance, but by a lesser amount than the drop in government costs. This suggests that the efficiency of government payments increases. For example, the current program raises the certainty equivalent returns of the less risk averse producer by about \$14,000 over the free market level at a cost of more than \$25,000. That is, it costs about \$1.80 for each one dollar rise in certainty equivalent returns. In contrast, under 100 percent whole farm revenue assurance, certainty equivalent returns of the less risk averse producer increase by \$10,757 at a cost of \$9,498, which implies that each dollar transferred to producers increases certainty equivalent returns by \$1.13.

The efficiency increase with revenue assurance is even more pronounced for the more risk averse producer. The current program increases certainty equivalent returns by about one dollar for each dollar transferred. But under revenue assurance, each dollar transferred raises certainty equivalent returns by \$1.69 under 100 percent crop specific revenue assurance, by \$1.97 under 100 percent whole farm revenue assurance, by \$2.61 under 80 percent crop specific revenue assurance, and by \$5.19 under 80 percent whole farm revenue assurance. The reason why the efficiency of government payments is so much higher under revenue assurance relative to the current program is that revenue assurance pays only when revenue is low, which implies that the benefit of the payment is high. In contrast, the current program may pay large deficiency payments when revenue from the market is also high.

A Note on Moral Hazard

Much debate has gone into the issue of whether a revenue assurance program would cause farmers to change their behavior to take advantage of the program. (Would the program be a hazard for the morals of farmers?) The more we looked at this issue, the less

Table 1. Planting decisions, certainty equivalent returns, and expected government costs under alternative government programs

Program	Corn Acreage	Soybean Acreage	CER ^a	Government Costs
Less risk averse producer				
Current Program	311	167	\$76,461	\$25,141
Free Market	250	250	\$62,490	\$0
<u>Revenue Assurance</u>				
100% Crop Assurance	250	250	\$74,813	\$11,178
100% Whole Farm	250	250	\$73,247	\$9,498
80% Crop Specific	250	250	\$65,001	\$2,024
80% Whole Farm	250	250	\$63,618	\$850
More risk averse producer				
Current Program	239	244	\$70,668	\$15,728
Free Market	250	250	\$55,199	\$0
<u>Revenue Assurance</u>				
100% Crop Assurance	250	250	\$70,038	\$8,768
100% Whole Farm	250	250	\$67,378	\$6,188
80% Crop Specific	250	250	\$59,584	\$1,679
80% Whole Farm	250	250	\$56,440	\$239

^a Denotes certainty equivalent returns

important it became. For example, if we use county-level yields and fix the base acreage, then there is nothing that producers can do to cheat even if they want to. If we use individual yields, then it is possible, but highly unlikely, that farmers would "farm the program." Farmers might be tempted to cut fertilizer costs in years when prices are so low that they fully expect a payment on revenue assurance. However, as we discovered in the results discussed above, the chances of this occurring are very small. Also, we know from other research that it almost always pays to choose the correct amount of fertilizer. Please refer to CARD Working Paper 94-WP 127 "Input Demand Under Revenue Assurance," by Bruce A. Babcock and David A. Hennessy for more details about these results.

There are program details that would raise moral hazard issues. For example a 100 percent revenue assurance program, based on farm specific yields and current (rather than historic) planting patterns would tempt some farmers to behave irresponsibly. However these problems can be eliminated by using common sense in the program design. We do not anticipate any real moral hazard problems with revenue assurance so long as the proportion assured remains below about 85 percent, and historic rather than current acreage patterns are used.

Revenue assurance would allow for much lower levels of government spending on agriculture, remove the distortions associated with existing programs, and dramatically improve the efficiency with which government agricultural program are run. Producer welfare, on the other hand, would decline under revenue assurance when compared to the existing program, except at a coverage level of 100 percent. At a 100 percent coverage level, certainty equivalent returns are only slightly below the level under current programs but the corresponding government costs are cut approximately in half. If current proposals to reduce government spending on agriculture by decreasing deficiency payments were to pass, then revenue assurance would become an attractive alternative to current programs operated at a reduced level of support.

FAPRI 1995 Baseline Results

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FAPRI's 1995 baseline, the benchmark numbers used as a reference point for policy analysis, was completed mid-January and presented to the U.S. House and Senate staffs on February 16-17, 1995. The ten-year projections, representing a composite of model results and judgments about future U.S. and international