



## Increased Probabilities of Crop Insurance Payments

*Gary Schnitkey and Bruce Sherrick*

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Recent commodity price declines have increased the probability that crop insurance products insuring revenue will make payments. Revenue products include Crop Revenue Coverage (CRC) and Revenue Assurance (RA), and Group Risk Income Plan (GRIP). CRC and RA insure revenues using farm-level yields to establish guarantees and payments. GRIP uses county yields. Potential payments from these products are described below.

### **Base and Harvest Prices**

CRC, RA, and GRIP use base prices in setting their revenue guarantees. These base prices are determined using settlement prices during the month of February of Chicago Board of Trade (CBOT) futures contracts. The December futures contract is used for corn and the November futures contract is used for soybeans. The 2008 base prices are \$5.40 per bushel for corn and \$13.36 per bushel for soybeans

CBOT futures prices also are used to determine harvest prices. These harvest prices enter the revenue calculations for crop insurance purposes. When revenue is below the guaranteed level, crop insurance products will make a payment. Lower harvest prices result in lower crop revenue and can result in crop insurance payments.

Similar to base prices, settlement prices of the December CBOT contract are used to determine the harvest price for corn. At the

time of the writing, the December corn contract is trading in the low \$4.00 per bushel range and the November soybean contract is trading in the mid \$9.00 per bushel range. A gauge of potential payments can be obtained by stating the harvest price as a percentage of the base price. If the actual yield equals the yield used to calculate the guarantee, the crop insurance product will make payments when the harvest price as a percentage of the base price is below the coverage level selected. For example, a \$4.00 harvest price for corn is 74 percent of the \$5.40 base price (see Table 1). If yields are near their average, crop insurance products with 75 percent or higher coverage levels will make payments. A \$9.00 soybean harvest price is 67 percent of the base price. If yields are at the guarantee yield, crop insurance products with 70 percent or higher coverage levels will make payments.

### **CRC and RA payments**

Specific examples of CRC and RA guarantees are shown in Table 2 for a farm with a 170 bushel Actual Production History (APH) corn yield and a 50 bushel APH soybean yield. This example uses a 75 percent coverage level. CRC and RA with the harvest price option (RA-HP) use the higher of the base or harvest price in calculating their guarantees. In 2008, it appears likely that the harvest price will be below the base price. Hence, the guarantee is calculated using the base price. The guarantee for corn is \$689

per acre (170 bushel APH yield x \$5.40 base price x 75% coverage level). The guarantee for soybeans is \$501.

CRC and RA will make payments whenever revenue is below the guarantee. Revenue equals the actual yield times the harvest price. Take a corn example with a 170 bushel yield and a \$4.00 harvest price. Crop revenue in this case is calculated as \$680 (170 bushel yield x \$4.00 price). Given the \$689 guarantee in Table 1, the insurance payment will be \$9 (\$689 guarantee minus \$680 revenue).

Two issues should be kept in mind when examining payments from these products:

1. CRC limits the amount by which harvest price can differ from the base price while RA does not have limits. The limit on the corn price decline is \$1.50 per bushel and the soybean limit is \$3.00 per bushel. For CRC, the limits imply that the lowest possible harvest price is \$3.90 for corn and \$10.36 for soybeans. In 2008, there is reasonable likelihood that harvest prices will be below the limits. During the first week of October 2008, for example, soybean prices on the November 2008 contract were well below the \$10.36 limit and if the monthly average remains below this level, then the \$10.36 effective price limit would be used for CRC. RA does not have these limits and the actual average price would be used. Because of these price limits, RA could have much larger payments than CRC.

To illustrate difference in payments, suppose that settlement prices average to \$9.50 per bushel. In this case, CRC would use \$10.36 as its harvest price because \$9.50 is below the limit. If yield equals 50 bushel per acre, CRC revenue equals \$518 (\$10.36 x 50 bushels). The \$518 CRC revenue is above the \$501 guarantee shown in Table 2 and an insurance payment would not be made. RA, on the other hand would use a \$9.50 harvest price, resulting in revenue of

\$475. The payment in this case would be \$26 per acre (\$501 guarantee - \$474 revenue)

2. For corn, October settlement prices are used to determine CRC's harvest price while November settlement prices are used for RA's harvest price. Given current price volatility, CRC's harvest price could also be substantially different from RA's harvest price.

### **GRIP Payments**

GRIP has the potential to make large payments this year as well. Most individuals purchase GRIP at the 90% coverage level; hence, prices do not have to decline as far before payments become possible. Payment estimates were developed for Champaign County, Illinois given that maximum protection level was chosen. For corn, the actual county yield was assumed to be 5 percent higher than the expected yield. Given a \$4.25 harvest price, GRIP would make a \$112 per acre payment. For soybeans, the actual county yield is assumed to equal the expected yield. At a \$9.40 harvest price, for example, GRIP payments would be \$146 per acre.

Two issues should be kept in mind:

1. Like CRC, GRIP has limits the degree to which the harvest price can differ from the base price. The limits for GRIP are the same as for CRC, or \$1.50 for corn and \$3.00 for soybeans limiting the range of prices in 2008 for corn to \$3.90-\$6.90 and for soybeans from \$10.36-\$16.36.
2. GRIP makes payments based on county yields. County yields will not be released until March of next year. Hence, payments will not occur until at least April of next year.

## Calculators on *farmdoc*

There are two tools available on *farmdoc* for calculating potential crop insurance payments.

1. The *Crop Insurance Decision Tool* is a Microsoft Excel spreadsheet that has a “what-if” section that estimates insurance payments based user specified on farm yields, county yields, and harvest prices. Figure 1 shows a Champaign county example for soybeans. This example is given for a 48 bushel farm yield, 52.6 bushel county yield and a \$9.40 harvest price. Given these yields and harvest price, RA will make payments at 75% and higher coverage levels, CRC will make payments at 80% and higher coverage levels, and GRIP will make payments at 80% or higher coverage levels. Defaults for county programs are included for all major Midwestern states. The tool is available for download from the *FAST* section of the *farmdoc* website (<http://www.farmdoc.uiuc.edu/fasttools/index.asp>). It is listed as a risk management tool of the *FAST* section.

2. The “*What if?*” *Analyzer* for spring deadline crops is available in the crop insurance section of *farmdoc*. This online tool will calculate insurance payments for use entered yields and harvest prices. It is available from the crop insurance section of *farmdoc*.

## Summary

Revenue products may make payments as a result of commodity price declines. Insurance payments could aid in reducing some of the losses resulting from commodity price declines.

*Note: This article was also published as FEFO 08-16.*

**Table 1. Harvest Price as a Percent of 2008 Base Price for Corn and Soybeans.**

Corn		Soybeans	
Harvest Price	Percent of Base Price <sup>1,2</sup>	Harvest Price	Percent of Base Price <sup>1,2</sup>
\$5.00	93%	\$12.00	90%
\$4.75	88%	\$11.50	86%
\$4.50	83%	\$11.00	82%
\$4.25	79%	\$10.50	79%
\$4.00	74%	\$10.00	75%
\$3.75	69%	\$9.50	71%
\$3.50	65%	\$9.00	67%
\$3.25	60%	\$8.50	64%
\$3.00	56%	\$8.00	60%

<sup>1</sup> Equals harvest price divided by base price. The 2008 base prices are \$5.40 for corn and \$13.36 for soybeans.

<sup>2</sup> CRC and GRIP limit the lowest possible harvest price. The lowest prices are \$3.90 for corn and \$10.36 for soybeans

**Table 2. Example Revenue Guarantees for CRC and RA <sup>1</sup>**

	Corn	Soybeans
APH yield	170	50
x base price	5.40	13.36
x coverage level	75%	75%
Guarantee	\$689	\$501

<sup>1</sup> CRC and RA harvest price uses the higher of the base or harvest price in calculating the guarantee.

**Figure 1.** Example Output from “*What-If?*” *Analyzer* in the *farmdoc* Crop Insurance Decision Tools.

**Crop/County Input**

<b>State:</b>	Illinois	
<b>County:</b>	Champaign	
<b>Crop:</b>	Soybeans	
<b>APH yield</b>	48	Actual Production History yield -- used to set guarantees
<b>Protection Level</b>	100	Percent of maximum protection level, Used to calculate GRP and GRIP payments.

**2008 Crop Insurance Parameters**

<b>APH price:</b>	\$11.50	Price for yield shortfalls on APH
<b>Base price:</b>	\$13.36	Set in February, sets guarantees on revenue products
<b>Expected county yield:</b>	52.6	Set guarantees on GRP and GRIP
<b>Max protection level:</b>		
- GRP	\$686	Used in payment calculation on GRP
- GRIP	\$1,054	Used in payment calculation on GRIP

**Estimated insurance payments, \$ per acre**

<b>Actual farm yield:</b>	48	Yield at harvest					
<b>Actual county yield:</b>	52.6	Yield at harvest					
<b>Harvest price:</b>	\$9.40	Average of settlement prices					
<b>Coverage Level</b>	<b>APH</b>	<b>RA-BP</b>	<b>RA-HP</b>	<b>CRC</b>	<b>GRP</b>	<b>GRIP-NoHR</b>	<b>GRIP-HR</b>
50%	0			0			
55%	0			0			
60%	0			0			
65%	0	0	0	0			
70%	0	0	0	0	0	0	0
75%	0	30	30	0	0	0	0
80%	0	62	62	16	0	32	32
85%	0	94	94	48	0	92	92
90%					0	146	146