


Crop Insurance Calculator: Program Overview

The Crop Insurance Calculator program aids the user in comparing gross revenues under alternative insurance products.

The main menu and description of required inputs are shown below. The program evaluates five revenue and/or yield insurance products. There are three input sections.



INSURANCE PAYMENT CALCULATOR
Version 1.2

This calculator will determine insurance payments for the following insurance products:

- [APH](#) Actual Production History insurance, a yield insurance.
- [IP](#) Income Protection insurance, a revenue insurance.
- [RA-BP](#) Revenue Assurance -- Base Price option, a revenue insurance.
- [RA-HP](#) Revenue Assurance -- Harvest Price option, a revenue insurance.
- [CRC](#) Crop Revenue Coverage, a revenue insurance.

The insurance calculator is divided into three sections:

Insurance Specification. Here you enter details about the insurance product.

Harvest Yields and Prices. Here you enter ending yields and prices. These prices are then used to calculate insurance payments.

Gross Revenue under Alternative Products. This section reports crop revenue, insurance payments and gross revenue for different insurance products. Changing yields and prices will allow you to see how different products perform in different situations.

Insurance Specifications: This section collects information about the insurance coverage. The crop insurance can be for either corn or soybeans. The program requires the actual production history (APH) yield, yield election, coverage level, indemnity price, and base price for the insurance. If the indemnity and base prices are unknown, the program is equipped with default prices from 2000. To use, click on the “Use 2000 Default Prices” button.

Insurance Specifications

Crop	<input type="text" value="corn"/>	<input type="button" value="Use 2000 Default Prices"/>	
APH yield	<input type="text" value="140"/>		The unit's insurable yield
Yield election	<input type="text" value="75%"/>		Used to determine yield guarantee under APH insurance
Coverage level	<input type="text" value="75%"/>		Used to calculate revenue guarantees under IP, RA, and CRC
Indemnity price	<input type="text" value="\$1.90"/>		Used to calculate indemnity payments under APH insurance
Base price	<input type="text" value="\$2.51"/>		Used in calculating revenue guarantees for IP, RA, and CRC

The above example evaluates yield and revenue insurances for a corn crop. The user has chosen an APH yield of 140 bushels per acre, a 75% yield election, and a 75% coverage level. The user chose to use the default prices from 2000. The indemnity price is \$1.90 and the base price is \$2.51.

For APH yield insurance, the user will collect indemnities if the actual harvested yield is below the yield guarantee of 105 bushels per acre (APH yield-140 X yield election-75%). For each bushel below the yield guarantee, an indemnity payment of \$1.90 per bushel will be paid.

For IP, RA, and CRC revenue insurance, the user will collect indemnities if the revenue at harvest is less than the revenue guarantee of \$263.55 per acre (APH yield-140 X the higher of the base price or harvest price-\$2.51 X coverage level = 75%). The indemnity payment per acre will be the difference between the revenue guarantee and the actual guarantee.

Marketing Alternatives: This section collects information related to forward pricing crops prior to harvest. The entries include: number of bushels that are forward priced, the forward price, and the loan deficiency rate. These entries allow a user to examine the impacts that forward pricing grain has on crop revenue. This is useful in looking to see if forward pricing grain lowers gross revenue under certain harvest prices and yields.

Marketing Alternatives			
Bushels forward priced	<input type="text" value="80"/>	State on per acre basis	
Forward price	<input type="text" value="\$2.36"/>	\$ per bushel	
Loan deficiency rate	<input type="text" value="\$2.00"/>	\$ per bushel	

The example above shows that the user has decided to forward price 80 bushels per acre at a forward price of \$2.63 per bushel. The loan deficiency rate is \$2.00. It is used in calculating loan deficiency payments later in the program.

Harvest Yields and Prices: This section collects yield and price information related to harvest. The entries include: actual yield at harvest, harvest price, and basis. These entries allow a user to see the impacts that harvest prices and yields have on gross revenue under different insurance products.

Harvest Yields and Prices			
Actual yield	<input type="text" value="90"/>	Yield at harvest time	
Harvest price	<input type="text" value="\$2.51"/>	Average futures price during Nov for corn, Oct for soybeans	
Basis	<input type="text" value="\$0.15"/>	Difference between futures price and cash price	

The example above shows that the user's actual yield at harvest was 90 bushels per acre. At harvest, the futures price for November corn was \$2.51. With a cash price of \$2.36, the basis is \$0.15 ($\$2.51 - \$2.36 = \$0.15$). The yield, price, and basis above are components in calculating crop revenue, loan deficiency payments, and insurance payments.

The **output report** is shown below. It contains the calculated gross revenue for each insurance product, as well as buttons used for viewing graphs of insurance payments and gross revenue.

	Gross Revenue under Alternative Insurance Products			
	----- Insurance Product -----			
	APH	IP RA-BP	CRC	RA-HP
Yield guarantee	105			
Revenue guarantee		\$264	\$264	\$264
Gross Revenue				
Crop revenue	\$212	\$212	\$212	\$212
Loan diff. payment	\$0	\$0	\$0	\$0
Insurance payment	\$29	\$38	\$38	\$38
Gross Revenue	\$241	\$251	\$251	\$251

	APH	IP or RA-BP	CRC	RA-HP
View Graphs (Clicking on the buttons will show graphs for different prices and yields)	<input type="button" value="Insurance Payments"/>	<input type="button" value="Insurance Payments"/>	<input type="button" value="Insurance Payments"/>	<input type="button" value="Insurance Payments"/>
	<input type="button" value="Gross Revenue"/>	<input type="button" value="Gross Revenue"/>	<input type="button" value="Gross Revenue"/>	<input type="button" value="Gross Revenue"/>

For each insurance product, gross revenue is the sum of 1. Crop revenue, 2. Loan deficiency payments, and 3. Insurance payments.

1. Crop revenue is the sum of the revenue earned from forward contracted bushels and the revenue from the remaining bushels at harvest using the cash price (remaining bushels X cash price).

For example, the crop revenue for the insurance products in the above example is \$212 per acre.

The revenue for forward priced bushels per acre equals \$188.80. This is calculated by multiplying the number of bushels per acre by the forward price entered in the "marketing alternatives input section". (80 X \$2.36).

The revenue for the remaining bushels equals \$23.60. This is calculated by multiplying the number of remaining bushels per acre by the cash price. The remaining bushels per acre that are not forward contracted equal the harvested yield minus the number of bushels per acre on forward contract. (90-80 = 10). The cash price equals the harvest price minus the basis. (\$2.51 - \$0.15 = \$2.36). The revenue for the remaining bushels is 10 multiplied by \$2.36 equaling \$23.60.

Total revenue equals $\$188.80 + \$23.60 = \$212.40$.

2. Loan deficiency payment (LDP) is a governmental support payment that occurs when the local cash price falls below the county's loan rate on a specific date.

The LDP is calculated when the loan deficiency rate (LDR) in the "Marketing Alternatives" input section are greater than the cash price (harvest price – basis) found in the "Harvest Yields and Prices" input section. The LDP is the difference between the LDR and the cash price, multiplied by the actual yield (found in the "Harvest Yields and Prices" input section).

In the example above, no LDP was collected. The LDR is \$2.00 and the cash price is \$2.36 (futures price: \$2.51 - basis: \$0.15). The cash price is greater than the LDR, so no LDP is paid.

3. Insurance payment refers to the insurance indemnity payments that were described in "Insurance Specifications" input section. The indemnity payments occur when yield or revenue are below the guarantees determined before harvest.

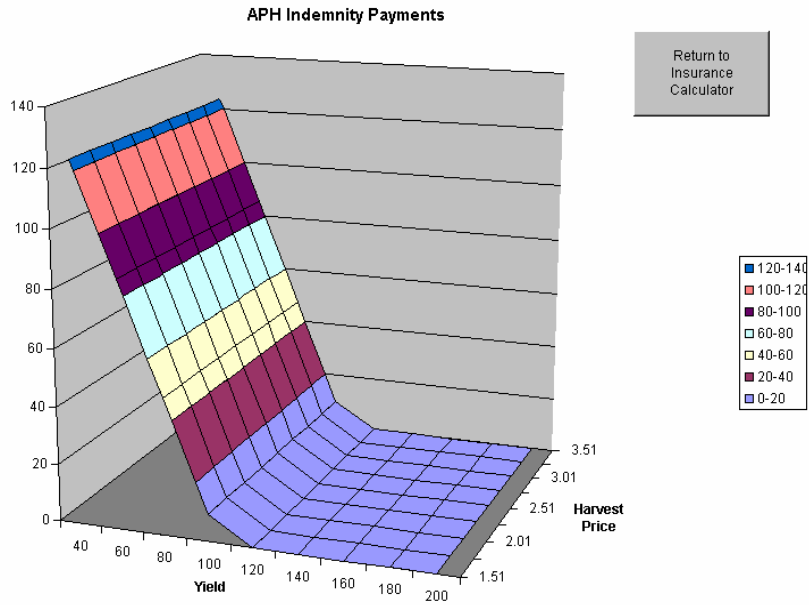
For APH yield insurance, the insurance payment in the example above is \$29 per acre. The calculation for indemnity payments is the difference between the yield guarantee shown above (105 bushels per acre) and the actual yield entered in the "harvest yields and prices" input section (90 bushels per acre). The difference is 15 bushels per acre. Since the actual production fell less than the guarantee, an indemnity payment is made. The payment is the difference in yield (15 bushels per acre) multiplied by the indemnity payment rate entered in the "insurance specifications" input section (\$1.90). The indemnity payment is \$28.50 per acre.

For IP, RA, and CRC revenue insurances, the insurance payment above is \$38 per acre. The calculation is the difference between the revenue guarantee shown above (\$264) and the actual revenue at harvest \$225.90 (harvest price: \$2.51 X actual yield: 90). The indemnity payment is \$38.10 per acre.

After reviewing the output report, we see that the gross revenue for the APH yield insurance product produced lower gross revenue than the revenue insurances.

Graphs: The model produces graphs that show insurance payments and gross revenue for differing harvest prices and yields. To produce a graph, click on the “Insurance Payments” or “Gross Revenue” button located under the insurance product name.

Below is the graph of “insurance payments” for the APH insurance product. This graph shows that at a production level of 90 bushels per acre and a harvest price of \$2.51, the indemnity payments fall in the “20-40” category.



Below is the graph of “gross revenue” for IP and RA-BP insurance products. This graph shows that at a production level of 90 bushels per acre and a harvest price of \$2.51, gross revenue falls in the “200-300” category.

