

# CHOOSING AMONG CROP INSURANCE PRODUCTS

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In this paper, general guidance is provided in selecting among the different crop insurance products available to Illinois grain farmers. This is accomplished by first listing the crop insurance products available during 1999. These products, perhaps with some modifications, will be available to Illinois farmers for the 2000 crop year. Then products are divided into types. How each type works is demonstrated. Finally, general rules for selecting between types are given.

## Crop Insurance Alternatives

In 1999, Illinois crop farmers have seven products providing multiple peril protection for corn and soybeans. In addition, private insurers offer endorsements that add to the coverage of some of these products. Three of the products are yield insurance and four of the products are revenue insurance.

Yield insurance makes payments when yield falls below a yield guarantee. These products are:

1. Catastrophic (CAT) pays when yield falls below 50 percent of a crop's Actual Production History (APH) yield. CAT is a minimum-level, catastrophic insurance product.
2. Group Risk Plan (GRP) pays when county yield falls below a county yield guarantee. The yield guarantee equals the expected county yield times a farmer-chosen yield election.

3. Actual Production History (APH) pays when actual yield falls below a yield guarantee. The yield guarantee equals a farm's APH yield times a farmer-chosen yield election.

Revenue insurance pays when revenue falls below a guarantee. Alternatives are:

1. Group Risk Income Protection (GRIP) pays when county revenue falls below a county revenue guarantee. The revenue guarantee equals expected county revenue times a farmer-chosen coverage level.
2. Income Protection (IP) pays when gross revenue falls below a revenue guarantee. The revenue guarantee equals the farm's APH yield times a base price times a farmer-chosen coverage level. For corn and soybeans, base prices are set using settlement prices of Chicago Board of Trade (CBOT) futures contracts during the month of February.
3. Crop Revenue Coverage (CRC) pays when gross revenue falls below a revenue guarantee. The revenue guarantee equals the farm's APH yield times the higher of the base or harvest price times the coverage level. The base price is the same price as used by IP insurance and is known in spring prior to when insurance has to be purchased (March 15<sup>th</sup>). The harvest price is determined in the fall. If the harvest price is greater than the base price, the revenue guarantee increases.
4. Revenue Assurance (RA) pays when gross revenue falls below a revenue guarantee. RA has two options. A base price option does not allow guarantee increases, causing RA to insure like IP. RA and IP, however, will differ in the units that can be insured. RA's second option, called harvest price option, allows the revenue guarantee to increase if the harvest price is greater than the base price. The harvest option causes RA to insure like CRC. RA and CRC

differ in the units that they can insure and the maximum increase in the revenue guarantee (RA does not have a maximum while CRC does).

### **Divisions of Insurance Products**

These products can be divided into types based on whether they insure yields (CAT, GRP, and APH) or revenue (GRIP, IP, CRC, and RA). Revenue insurance products are further divided into two types depending on whether the revenue guarantee can increase. The increasing guarantee is useful for farmers who hedge production prior to harvest. The disadvantage of the increasing guarantee is that per acre premiums are higher. Figure 1 shows these divisions.

Besides being yield or revenue insurance, another factor differing between the insurance product is what they insure (see Figure 1). GRP and GRIP provide insurance for county yield and county revenue, respectively. The other insurance products (CAT, APH, IP, CRC, and RA) insure individual farm yields or revenue. A major advantage of products insuring county results is that they generally provide more risk reduction for a given cost. The major disadvantage of county products is that they do not insure an individual farm's results. Sometimes, county results will not match individual farmer results. For example, a farmer could have a poor year while the county does not. In these cases, indemnity payments will not be received.

## Figure 1. Division of Products

|                             | ----- insures ----- |             |
|-----------------------------|---------------------|-------------|
|                             | Individual          | County      |
| <b>1. Yield insurance</b>   | <b>CAT, APH</b>     | <b>GRP</b>  |
| <b>2. Revenue insurance</b> |                     |             |
| no guarantee increase       | <b>IP, RA*</b>      | <b>GRIP</b> |
| guarantee increase          | <b>CRC, RA*</b>     |             |

\* RA has an election allowing the guarantee to increase or not increase.

### A Comparison of Yield and Revenue Insurance

APH, IP, and CRC insure individual farm results. These products are compared to illustrate the difference between yield insurance (APH), revenue insurance with no guarantee increase (IP), and revenue insurance allowing guarantee to increase (CRC). RA is not included in the example. For this example, RA with the base price option functions similar to IP. RA with the harvest price option functions similar to CRC.

The comparison is based on the same coverage levels (75 percent yield election under APH and 75 percent coverage level under IP and CRC). APH and IP will have roughly the same per acre premiums. CRC's premiums will be roughly 50% higher than premiums than APH and IP. In the example, corn having 120 bu. APH yield is insured. Prices used in the example

reflect 1999 conditions. The base price for corn is \$2.40 per bu., equaling the average of the settlement prices of the December CBOT futures corn contract during the month of February.

Under APH, the yield guarantee is 90 bu. per acre (120 bushels x 75 percent yield election). An indemnity payment occurs when actual yield is below 90 bu. In this example, indemnity payments will be based on an indemnity price of \$2.10, the highest price a farmer could choose to insure yields during 1999. An indemnity payment of \$21 per acre occurs when actual yield is 80 bu. ((90 bu yield guarantee – 80 bu actual yield) x \$2.10 price).

Under IP, the revenue guarantee is \$216 per acre, found by multiplying the 120 bu. APH yield by the \$2.40 base price by the 75% coverage level. IP will make a payment any time revenue is below \$216. Revenue is calculated by multiplying actual yield times a harvest price. The harvest price for corn is based on settlement prices of the CBOT December futures contract during the month of November. A \$2.10 harvest price and a 100 bu. actual yield gives \$210 of revenue (100 bu. yield x \$2.10 harvest price). Given this revenue, IP makes an indemnity payment of \$6 (\$216 revenue guarantee - \$210 actual revenue).

When the harvest price is less than the base price, CRC and IP will have the same revenue guarantee. For the above example, the guarantee is \$210. When the harvest price is greater than the base price, CRC will have a higher revenue guarantee compared to IP. CRC's revenue guarantee is \$234 for a \$2.60 harvest price ( $\$234 = 120 \text{ bu. APH yield} \times \$2.60 \text{ price} \times 75\% \text{ coverage level}$ ) while IP's revenue guarantee remains at \$216.

Table 1 shows indemnity payments for IP and CRC for different actual yields given that the harvest price is \$2.10. Because the harvest price is below the base price, IP and CRC will have the same payments. At an 80 bu. yield level both IP and CRC will pay indemnities of \$48 per acre. At a 90 bu. actual yield, IP and CRC will both pay \$27 per acre.

Table 1. Insurance Payment Under APH, IP, and CRC for a \$2.10 Harvest Price

| Insurance | ----- Actual Yield ----- |        |         |
|-----------|--------------------------|--------|---------|
|           | 80 bu.                   | 90 bu. | 100 bu. |
| APH       | \$21                     | \$0    | \$0     |
| IP        | \$48                     | \$27   | \$6     |
| CRC       | \$48                     | \$27   | \$6     |

Table 2 shows indemnity payments for different actual yields given that the harvest price is \$2.60. Because the harvest price is greater than the base price, IP and CRC will have different indemnity payments. At an 80 bu. actual yield, IP will have a \$8 per acre indemnity payment while CRC will have a \$26 per acre indemnity payment.

Table 2. Insurance Payment Under APH, IP, and CRC for a \$2.60 Harvest Price

| Insurance | ----- Actual Yield ----- |        |         |
|-----------|--------------------------|--------|---------|
|           | 80 bu.                   | 90 bu. | 100 bu. |
| APH       | \$21                     | \$0    | \$0     |
| IP        | \$8                      | \$0    | \$0     |
| CRC       | \$26                     | \$0    | \$0     |

## **Choice Between the Products**

Farmers should usually at least choose CAT coverage. While CAT does not provide much coverage, its costs are low. If more protection is desired, one of the other products will have to be selected.

Choosing among the products that provide additional coverage can proceed along the line of the major divisions in Figure 1. The first choice is between individual or county coverage. The second choice is whether to choose yield insurance, revenue insurance with no guarantee increase, or revenue insurance allowing the revenue guarantee to increase.

### **Individual or County Insurance**

County level insurance products (GRP and GRIP) are excellent products for farms whose yields closely track county average yields. Tracking occurs when the following two conditions are met. First, the farm's yields are above average when the county yields are above average and vice versa. Second, farm yields do not fall too far below the county yields. If farm yields do not fall 20 percent below county yield, the second condition is met.

Many farms in Illinois meet these two conditions, particularly in the central part of the state. In my opinion, county level products are under-used. Because of lower costs associated with administering county-level products, GRP and GRIP can provide significant risk reductions at costs lower than individual yield products. The major disadvantage to county-level products is they do not insure an individual farm's results. It is possible for a farm to have poor yield while the county will not have a poor yield.

## **Yield and Revenue Insurance**

The choice between a yield or revenue insurance generally should be dictated by the use of pre-harvest marketing alternatives. Marketing alternatives include forward pricing of grains, selling futures contracts, and buying put options.

If these alternatives are used for less than 20 percent of expected production, revenue products with no guarantee increase are good alternatives (ie. IP, RA base price option, or GRIP). Revenue insurance policies include features similar to hedging. Therefore, these policies substitute for marketing alternatives. Moreover, hedging may offset the pricing provisions of the revenue insurance, thereby increasing risks. Therefore, use of marketing alternatives should be undertaken with caution if revenue insurance is purchased.

If marketing alternatives are used for somewhere between 20 and 50 percent of expected production, yield products are good alternatives (i.e., APH and GRP). The yield insurance will provide protection against yield declines while the marketing alternatives will provide protection against price increases.

If marketing alternatives are used aggressively, revenue products allowing guarantee increases are alternatives (i.e., CRC or RA with the guarantee increase provision). The guarantee increase provision provides protection against instances in which yields are low and prices rise. In these cases, the guarantee increase will offset some or all of the losses associated with the marketing alternatives. This provision does come at a cost. Revenue products allowing for guarantee increases are more expensive than either yield products or revenue products not allowing for guarantee increases.