



Southern Region



Risk Management
Education Center

Risk Management Education



Risk Management Education Series Fact Sheet 2

Types of Crop Insurance Policies*

The Risk Management Agency (RMA) of the USDA has provided two types of agricultural insurance: a traditional yield based insurance plan (crop yield insurance) and the recent revenue based insurance plan (revenue insurance). Crop yield insurance includes *Multiple Peril Crop Insurance* (MPCI), *Group Risk Plan* (GRP), and *Annual Production History* (APH) *Catastrophic* (CAT) coverage. Revenue insurance programs currently offer five insurance products: *Crop Revenue Coverage* (CRC), *Revenue Assurance* (RA), *Income Protection* (IP), and *Group Risk Income Protection* (GRIP)¹. Each plan has features that are discussed below.

This fact sheet will discuss major crop insurance policies and present an example of each policy, including APH, CAT, GRP, CRC, RA, IP and DO.

1. Actual Production History (APH).

APH coverage is the oldest and most widely available crop insurance plan. The policies are available for most insured crops and are individual yield-base policies. Yield coverage levels are based on a producer's expected yield calculated from the farm's actual

production history over the period of the last four to ten years. APH protects farmers against yield losses due to natural causes such as drought, excessive moisture, hail, wind, frost, insects, and disease. The farmer selects a level of coverage from 50% to 85% of their average yield and an indemnity price ranging from 55% to 100% of the crop price established annually by RMA.

If the harvested yield is less than the yield coverage level, the farmer is paid an indemnity based on the difference.

Catastrophic (CAT) Coverage CAT coverage provides a lower level of coverage on yield losses at a low cost to producers. It is fully subsidized by the federal government. That is, farmers pay no minimum premium. The only expenses are administration fee of \$100 for each basic unit (per crop) insured in a county or parish regardless of the type of crop or the number of acres.

The total indemnity equals the yield shortfall multiplied by the indemnity price multiplied by acres insured. The policy reimburses production losses below 50% yield coverage level (yield guarantee) at 55% of established price.

¹ USDA: "Farm and Commodity Policy: Program Provisions", briefing room. At: <http://www.ers.usda.gov/Briefing/FarmPolicy/insure.htm>. Accessed in May, 2007.

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Hence, the policy is usually referred as a 50/55 policy. Since 1998, producers have to obtain CAT policies from private insurance companies.

Example CAT coverage: Suppose a corn producer has an APH yield of 160 bushels per acre and an established price of \$2.20 per bushel. Given these data, the coverage level is 80 bushels per acre (160 bu x 50%) with an indemnity price of \$1.21 per bushel (\$2.20 x 55%). The total protection, the amount that would be paid in the event of a zero yield, is \$96.80 (80 bu x \$1.21) per acre. If the actual yield is 70 bushels per acre, then the indemnity paid to the grower will be \$12.10 per acre (80 – 70) x \$1.21. Table 2 shows examples of CAT coverage under different scenarios.

Table 1. Example of CAT coverage

Established Price US \$ per bushel	Actual yield Bushels per acre	Indemnity Payment US \$ per acre
1.80	0	79.20
	30	49.50
	80	0.00
	100	0.00
2.20	0	96.80
	30	60.50
	80	0.00
	100	0.00
2.40	0	105.60
	30	66.00
	80	0.00
	100	0.00
	100	0.00

Note: APH yield = 160 bushels per acre of corn.

CAT and “Buy-up” Coverage In the event of a total loss, i.e. zero yields, however, CAT provides only an indemnity payment of 27.5% of the expected revenue from the crop (50% of yield coverage and 55% of indemnity price). In some instances, farmers wish to have higher protection above the CAT

level through “buy-up” coverage. The buy-up coverage is partly subsidized by the federal government and must be purchased from private insurance agents.

Example APH Coverage: Suppose a corn producer has an APH yield of 150 bushels per acre. The projected price is \$2.40 per bushel and the producer selects 75% APH coverage with 100% price coverage. The producer’s yield guarantee is 112.5 bushels per acre. An indemnity payment to the producer is due if the actual yield is below 112.5 bushels per acre even if the harvest price falls below the projected price.

However, if the actual yield does not fall below the yield guarantee, even if the harvest price falls below the projected price, the producer does not receive an indemnity. Thus APH partially insures against production risk, but does not insure against price risk. In this example, suppose that the actual yield is 100 bushels per acre and harvest price is \$2.2 per bushel. The producer will receive an indemnity payment of \$30 per acre (112.5 – 100) x \$2.4.

Table 2 provides examples of indemnity payments under different yield coverage levels and 100 % price coverage for corn producer. The expected yield is 150 bushels per acre and the expected price is \$2.40 per bushel.

The examples also give alternative harvest prices: below the expected price (\$1.90 per bushel) and above the expected price (\$2.55 per bushel). It is clear from table 2 that the harvest price does not affect the amount of indemnity payments since the APH only protects against low yields

Table 2. Examples of indemnity payments and total revenue for APH coverage under different scenarios for corn (all values are per acre insured)

<u>Yield Coverage Level</u>		<u>Indemnity Payments under Alternative Actual Yields</u>			
		75	85	95	105
Percent	Bushels				
55%	82.5	18	0	0	0
75%	112.5	90	66	42	18
85%	127.5	126	102	78	54
<u>Case</u>	<u>Harvest Price</u>	<u>Actual Revenue</u>			
A	1.90	142.50	161.50	180.50	199.50
B	2.55	191.25	216.75	242.25	267.75
<u>Total Revenue = Actual Revenue + Indemnity Payment</u>					
<u>Under Case A</u>					
<u>Yield Coverage Level</u>		<u>Total Revenue</u>			
Percent	Bushels				
55%	82.5	160.50	161.50	180.50	199.50
75%	112.5	232.50	227.50	222.50	217.50
85%	127.5	268.50	263.50	258.50	253.50
<u>Total Revenue = Actual Revenue + Indemnity Payment</u>					
<u>Under Case B</u>					
<u>Yield Coverage Level</u>		<u>Total Revenue</u>			
Percent	Bushels				
55%	82.5	209.25	216.75	242.25	267.75
75%	112.5	281.25	282.75	284.25	285.75
85%	127.5	317.25	318.75	320.25	321.75

Notes: Expected yield - 150 bushels per acre; expected price - \$2.40 per bushel; coverage price – 100%.

2. Crop Revenue Coverage (CRC)

CRC is the most widely used revenue protection plan currently available for corn, cotton, grain sorghum, rice, soybean, and wheat. CRC provides protection against gross revenue; hence it contains provisions addressing both yield and price risks. Guaranteed revenue is equal to the farmer's elected coverage level (55% to 75%) multiplied by the APH yield multiplied by the commodity price. The APH yield is specific to a farm and is usually based on the yield history from an insured unit. Prices are determined using Chicago Board of Trade (CBOT) future contracts.

Prior to the deadline for signing up for insurance, base prices are used to calculate a "base revenue guarantee."

When a farmer's actual revenue (actual yield times harvest market price) is below the guaranteed revenue, CRC pays an indemnity equal to the difference between those two amounts.

Note that CRC coverage limits the prices for corn and soybeans. The harvest price for corn cannot be more than \$1.50 above or below the base market price. The harvest price of soybeans cannot be more than \$3 below or above the base market price.

Table 3. Examples of CRC indemnity payments under different scenarios

	Low Yield Low Price	Avg. Yield Low Price	Low Yield High Price	High Yield Low Price
Expected Price	2.40	2.40	2.40	2.40
APH Yield	140	140	140	140
Coverage Level	75%	75%	75%	75%
Revenue Guarantee	252	252	252	252
Harvest Price	1.90	1.90	3.00	1.90
Actual Yield	90	140	90	170
Actual Revenue	171	266	270	323
Adjusted Revenue Guarantee	-	-	315	-
Indemnity Payment	81	0	45	0

Example CRC:

Revenue Guarantee Suppose a corn producer has an APH yield of 140 bushels per acre, the projected price is \$2.40 per bushel, and the producer selects 75% APH coverage. The revenue guarantee is \$252 per acre (140 bu x \$2.40 x 75%). Revenue guarantee is also subject to update, depending on the harvest price. Base revenue guarantee will increase if harvest price is greater than the base price. For instance, if harvest price is \$3.00, for instance, the revenue guarantee will be \$315 per acre (150 bu x \$3.00 x 75%).

Actual Revenue Actual revenue is used to calculate indemnity payments. Actual revenue equals actual yield times the harvest price (based on CBOT). Hence if the harvest price is \$2.20 per bushel and the actual yield is 90 bushels per acre, the actual revenue will be \$198 per acre.

Indemnity Payments An indemnity payment occurs when gross revenue is below the revenue guarantee. In our example, an indemnity payment equals to \$54 is due to the producer.

Table 3 illustrates possible indemnity payments with different combinations of actual yields and harvest prices. In column 2, with low yield and low price, a farmer receives an indemnity payment

of \$81 per acre. In column 4, low yield combined with high price results in an indemnity payment of \$45 per acre. In this example, though the actual price is already above the revenue guarantee previously set, the farmer still receives an indemnity payment. This is because there is an adjustment in revenue guarantee due to higher harvest price.

3. Group Risk Plan (GRP)

GRP is tied to county yield rather than to individual farm yield and is available for selected crops in selected regions. Similar to buy-up coverage, GRP is partly subsidized and must be purchased from a private insurance agent. GRP policies pay indemnities if the county average yield drops below a threshold or guaranteed level, regardless of the farmer’s actual yield. Yield coverage is available for up to 90% of the expected county yield. This type of insurance is useful when a farmer’s individual yield typically follows the country pattern.

GRP allows a grower to select yield coverage and protection level. Yield coverage ranges from 70% to 90% of the expected county or parish yield as determined by RMA. The protection level (dollars of protection) can be 60% to 100% of the expected county revenue, which is the county average yield multiplied by the maximum indemnity price.

Table 4. Examples of GRP indemnity payments under different scenarios

		Amount of indemnity payments under different actual average county/parish yields and yield election or protection election (US \$ per acre)				
County yield	→	75	80	90	100	115
<u>Yield Election (%)</u>						
	70	86	71	43	14	0
	75	100	87	60	33	0
	80	113	100	75	50	13
	85	124	112	88	65	29
	90	133	122	100	78	44
<u>Protection Level</u>						
	100 %	113	100	75	50	13
	110%	124	110	83	55	14
	120%	135	120	90	60	15
	130%	146	130	98	65	16
	140%	157	140	105	70	18
	150%	169	150	113	75	19

GRP allows the grower to select yield coverage and protection level. Yield coverage ranges from 70% to 90% of the expected county or parish yield as determined by RMA. The protection level (dollar amount of protection) can be set from 60% to 100% of the expected county revenue, which is the county average yield multiplied by the maximum indemnity price.

Example GRP coverage: Suppose the expected parish average corn yield is 150 bushels per acre. A farmer located in this parish selects 80% coverage level. The yield coverage is 120 bushels per acre (80% of 150 bushels). The farmer collects an indemnity payment if the actual county average yield is below 120 bushels per acre, regardless of the farmer’s actual yield. The indemnity payment depends on the protection level a farmer chooses. Suppose that the actual county yield is 110 bushels per acre. If RMA sets the maximum protection at \$300, and a farmer chooses a protection level of \$270(90%), then the indemnity amount is \$22.5 per acre

(\$270 x 8.33%). RMA sets the GRP maximum protection level each year.

The percentage loss is

$$\% \text{ loss} = \frac{120 - 110}{120} = 8.33\%$$

Given the protection level of \$270 per acre (90 %), the indemnity payment = \$270 x 8.33% = \$22.50 per acre.

Table 4 gives additional examples of indemnity payments for GRP plan with different yield election and protection levels. For yield election, the protection level is 100%. For protection level election, yield coverage level is 80%. Expected county/parish yield is 150 bushels per acre and the maximum protection provided by RMA is \$300.

4. Revenue Assurance (RA)

RA protects farmers against reduction in gross income when either prices or yields decrease during the crop year from early-season expectation. The coverage and exclusions for RA are similar to those the standard APH

policy. The difference is that APH provides coverage for loss of production while RA provides coverage to protect against loss of revenue caused by low prices or low yields or combination of the two. RA is similar to CRC, with two exceptions: (1) the standard RA policy contains the “base price option” (RA-BP), in which the revenue guarantee is determined by the pre-planting price or February futures prices; (2) farmers may select RA coverage with “the harvest price option” (RA-HP), where the revenue guarantee may increase up to harvest time, like CRC. The harvest price option carries a higher premium than the BP option. Another difference is that revenue coverage under RA is always determined using 100% of the base price, whereas CRC gives farmers the option of using 95% of the base price in exchange for a lower premium.

Revenue guarantee Under RA-BP, the revenue guarantee equals APH yield times a base price times a coverage level. Coverage level, which is selected by the farmer, ranges from 50% to 75% of expected gross revenue. The base price, which reflects estimates of futures prices at harvest time, is calculated using CBOT future contracts. Under RA-HP, the revenue guarantee equals the APH yield multiplied by the higher of the base price or harvest price, multiplied by the coverage level. The revenue guarantee will increase if the harvest price is greater than the base price. In such, the base price is treated like a “floor price” under RA-HP. Like the base price, the harvest price is also determined using CBOT by averaging the settlement prices during the month of February.

Actual Revenue. Actual revenue is the actual yields multiplied the harvest price.

Harvest prices are determined from CBOT future contracts. The actual revenue determines whether an insured farmer receives an indemnity payment.

Example 1: RA-BP

Revenue Guarantee. Suppose a corn producer has an APH yield of 140 bushels per acre, with the base price of \$2.40 per bushel. A 75% coverage level is selected. The revenue guarantee is \$252 per acre ($140 \times \$2.40 \times 75\%$).

Actual Revenue. For the same producer, if harvest price is \$2.20 per bushel and an actual yield is 90 bushels per acre, the actual revenue is \$198 per acre.

Indemnity Payments. Based on revenue guarantee and actual revenue, the farmer receives an indemnity payment of \$54 per acre because the gross revenue is below the revenue guarantee.

Example 2: RA-HP

Revenue Guarantee Suppose a corn producer has an APH yield of 140 bushels per acre, with a base price of \$2.40 per bushel and selects 75% level of coverage. The revenue guarantee is \$252 per acre ($140 \times 2.40 \times 75\%$). If during the growing season the harvest price increases above the base price, the revenue guarantee will increase. For instance, if the harvest price is \$3.00 per bushel, then the revenue guarantee is \$315 per acre ($140 \times 3.00 \times 75\%$).

Actual Revenue If the harvest price is \$2.20 per bushel and actual yield is 90 bushels per acre, then actual revenue is \$198 per acre. However, if the harvest price is \$3.00 per bushel, then actual revenue increased to \$270 per acre.

Table 5. Examples of RA indemnity payments under different scenarios

	Low Yield Low Price	Avg. Yield Low Price	Low Yield High Price	High Yield Low Price
RA-BP				
Expected Price	2.40	2.40	2.40	2.40
APH Yield	140	140	140	140
Coverage Level	75%	75%	75%	75%
Revenue Guarantee	252	252	252	252
Harvest Price	1.90	1.90	3.00	1.90
Actual Yield	90	140	90	170
Actual Revenue	171	266	270	323
Adjusted Revenue Guarantee	-	-	-	-
Indemnity Payment	81	0	0	0
RA-HP				
Expected Price	2.40	2.40	2.40	2.40
APH Yield	140	140	140	140
Coverage Level	75%	75%	75%	75%
Revenue Guarantee	252	252	252	252
Harvest Price	1.90	1.90	3.00	1.90
Actual Yield	90	140	90	170
Actual Revenue	171	266	270	323
Adjusted Revenue Guarantee	-	-	315	-
Indemnity Payments	81	0	45	0

Note: Under RA-BP, there is adjustment revenue guarantee while under RA-HP revenue guarantee increases as harvest price increases. RA-HP is similar to CRC coverage (see examples of CRC).

Indemnity Payments. With the harvest price equals \$2.20 per bushel, the producer receives an indemnity payment of \$54 per acre. If the harvest price is \$3.00 per bushel, the producer receives \$45 per acre.

Additional examples of RA coverage with scenarios for corn are in Table 5.

5. Income Protection (IP) and Dollar Plan (DO) Coverage

A. Income Protection (IP)

IP provides protection similar to RA with the base price option but requires producers to use individual producers' APH (enterprise units). This means that all acres of all policy holders for the insured crop located in the same county are calculated in a single policy. Although it reduces the premiums, it requires losses to be more widespread before an indemnity payment is made. IP

protects against low prices, low yields, or combination of both low prices and low yields. An indemnity is due when the actual revenue (gross revenue) is less than the amount of coverage (revenue guarantee).

Revenue Guarantee The revenue guarantee equals APH yield multiplied by a base price multiplied by coverage level. Coverage level is selected by the farmer and ranges from 50% to 75% of expected revenue. The base price, which reflects estimates of futures prices at harvest time, is calculated using CBOT future contracts.

Actual revenue Actual revenue is equal to actual yields multiplied by the harvest price. Harvest prices are determined from CBOT futures contracts. The actual revenue is used to determine whether an insured receives an indemnity payment.

Table 6. Examples of IP indemnity payments under different scenarios

	Low Yield Low Price	Avg. Yield Low Price	Low Yield High Price	High Yield Low Price
Expected Price	2.40	2.40	2.40	2.40
APH Yield	140	140	140	140
Coverage Level	75%	75%	75%	75%
Revenue Guarantee	252	252	252	252
Harvest Price	1.90	1.90	3.00	1.90
Actual Yield	90	140	90	170
Actual Revenue	171	266	270	323
Adjusted Revenue Guarantee	-	-	-	-
Indemnity Payment	81	0	0	0

Example

Revenue Guarantee Suppose a corn producer has an APH yield of 140 bushels per acre, with the base price of \$2.40 per bushel. If a 75% level is selected, the revenue guarantee is \$252 per acre (140 times 2.40 times 75%).

Actual Revenue For the same producer, if the harvest price is \$2.20 per bushel and an actual yield is 90 bushels per acre, the actual revenue is \$198 per acre.

Indemnity Payments In our example, a producer receives an indemnity payment of \$54 per acre since actual revenue is below the revenue guarantee. However, if the harvest price is \$3.00 per bushel, then an indemnity payment is not made because actual revenue (\$270) is greater than the revenue guarantee (\$252).

There is no adjusted revenue guarantee with IP coverage. Table 6 provides additional examples for IP coverage under different scenarios.

Notes: IP Insurance & Enterprise Unit
Based on examples of CRC and RA, Income Protection (IP) is similar to CRC and RA using the base option. The only difference is that enterprise units are the only choice for IP. Other insurance

products (RA, CRC and MPCU) offer enterprise units as an option. Producers who choose enterprise unit under RA and CRC receive premium discounts. In any insurance, enterprise unit combines all acres of a single crop within a county or parish in which the policy holder has a financial interest into a single unit, regardless of whether owned or rented, or the number of landlords involved. Premiums under enterprise unit are usually lower than basic units. This is because enterprise units are usually larger than the basic units so that the average yield is less likely to trigger an indemnity payment. A more detailed discussion of enterprise units is: "Actual Production History and Insurance Units for Multiple Peril Crop Insurance" by William Edward, Iowa State University.

B. Dollar Plan (DO) Coverage

DO pays for quantity and quality yield losses and is limited to crops like tomatoes and strawberries. DO provides protection against declining damage that causes a yield shortfall. Coverage is based on the cost of growing a crop in a specific area. It guarantees a dollar amount per acre rather than a particular yield level. A loss occurs when the annual value of the crop is less than the amount of insurance.

6. Additional Resources

For more information on general crop insurance information, go to USDA RMA web page
<http://www.rma.usda.gov/>

and National Crop Insurance Service
<http://www.ag-risk.org/>
(913) 685-2767

To locate crop insurance providers, go to
<http://www3.rma.usda.gov/tools/agents/companies/indexCI.cfm>

For premium calculation, go to RMA premium calculator web page
<http://www3.rma.usda.gov/apps/premcalc/>

To locate a crop insurance agent, go to
<http://www3.rma.usda.gov/apps/agents/index.cfm>

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