

# Analysis of YP, RP and RP+HPE Crop Insurance Alternatives for Cotton Producers in South Texas



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## Introduction

The introduction of new risk management tools by the Risk Management Agency (RMA) of the United States Department of Agriculture (USDA) for the 2011 crop year provides increased flexibility and risk management options for cotton producers in South Texas. This poster will compare the characteristics of each of these products and how they may be applicable to cotton producers in the South Texas area.

For several years the RMA and various private insurance companies that deliver crop insurance protection negotiated a major overhaul of the basic policy that is used for most insurable crops. The Common Crop Insurance Policy (CCIP) which is also referred to as COMBO, went into effect for 2011 cotton crop (Edwards).

Instead of a different policy for each type of insurance, there is now one master policy with several contract options that include Yield Protection (YP), Revenue Protection (RP) and Revenue Protection with Harvest Price Exclusion (RP+HPE).

Yield Protection (YP) is equivalent to the old Actual Production History (APH) policy. YP establishes a guarantee based on the APH yield, which is determined by four to ten years of actual yield records. No changes were made in how APH yields are calculated for each insurance unit. Producers can choose to guarantee from 50 to 85 percent of their current APH yield. A major change from the old APH policy is that the indemnity price used to calculate the payment made to the producer in the event of a loss is now the same as the price used for revenue insurance policies (Edwards).

Previously RMA set the indemnity price using forecasts for fall cash prices. Under the CCIP, cotton producers in the Lower Rio Grande Valley and Lower Coastal Bend have prices determined using the harvest year October cotton futures contract prices, with the projected price being determined as an average of the settlement prices over the December 15 to January 14 time period and the harvest price determined using the average of the settlement prices from the September 1 to September 30 time period. Producers can choose to use from 55 to 100 percent of this price for the indemnity price at which yield losses are paid. Naturally, choosing a higher percent of the price will result in a higher premium, and most price elections are for 100%. Catastrophic level yield coverage (CAT) is still available and is equivalent to a guarantee of 50 percent of the APH yield, and losses are paid at 55 percent of the indemnity price (Edwards).

A producer can also choose RP, which is equivalent to the old Crop Revenue Protection (CRC) and the old Revenue Assurance with the harvest price option (RA-HPO). The new RP contract guarantees the insured producer a minimum number of dollars of gross revenue per acre. The yield used to set the RP guarantee is the same as the APH yield used for Yield Protection, and the price is the same as for the YP contract described earlier. The RP guarantee is the product of these two values, times the level of guarantee selected (from 65 to 85 percent). There is no option to select less than 100 percent of the base price for the guarantee, and catastrophic coverage is not available. If the average futures price for the relevant contracts during the month of harvest price discovery period is higher than the base price, the guarantee is increased, based on the harvest price. In this case, the harvest price is also used to calculate the “actual” revenue. This is exactly the same procedure that was used previously for CRC policies (Edwards).

The third option is called Revenue Protection with Harvest Price Exclusion (RP+HPE). It is equivalent to the former basic Revenue Assurance (RA) policy. Under this option the guarantee does not increase if the harvest price is higher than the base price. Consequently, premiums will be lower for RP+HPE than RP. Previously CRC and RA used different procedures for computing premiums each year. In some years RA-HPO was cheaper than CRC, and in other years CRC was cheaper, despite the fact that they offered essentially the same coverage. Under the new CCIP only one set of premiums will be offered. The level of premium subsidies provided by RMA was not changed (Edwards).

## Data and Methods

This poster will demonstrate the use of enterprise budgets for the Lower Coastal Bend in estimating insured margins for cotton production. The insurance premiums and indemnities were estimated using the RMA estimator tool. The poster will also present a summary of cotton crop insurance purchases for the 2009 and 2011 crop years for the selected cotton producing counties in the lower Rio Grande Valley and Texas Coastal Bend to describe preliminary adoption of the risk management tools.

The estimated cost of production for the Texas Coastal Bend cotton operation used in this study is shown below in Table 1. This cost of production estimate is based on a 700 pound yield goal, using 24-row-equipment and projected to be custom harvested. This budget was developed using the Mississippi State Budget Generator, based on producer and local input

supplier estimates. Total cost of production at the target yield of 700 pounds per acre is \$551.74 per acre, resulting in a breakeven cost of production of 62.31 cents per pound of lint after netting out the seed credit. The insurance cost component in the budget is for a yield protection policy, with a 65% yield guarantee and a 100% price guarantee and calculated to be \$25.21 per acre.

Table 1. Estimated Cost of Production for Cotton in the Texas Coastal Bend, 2011.

| Cotton-Genetically Modified Seed & Conventional Till            |      |           |          |              |
|-----------------------------------------------------------------|------|-----------|----------|--------------|
| Dryland - 24 Row Equipment - 800# Yield Goal, District 11, 2011 |      |           |          |              |
| ITEM                                                            | UNIT | PRICE     | QUANTITY | Total Amount |
| INCOME                                                          |      |           |          |              |
| Cotton Lint                                                     | lb   | \$ 1.07   | 700      | \$ 749.00    |
| Cotton Seed                                                     | ton  | \$ 275.00 | 0.51     | \$ 140.25    |
| TOTAL INCOME                                                    |      |           |          | \$ 889.25    |
|                                                                 |      |           |          |              |
| TOTAL DIRECT EXPENSES                                           |      |           |          | \$ 437.16    |
| RETURNS ABOVE DIRECT EXPENSE                                    |      |           |          | \$ 452.09    |
|                                                                 |      |           |          |              |
| TOTAL FIXED EXPENSES                                            |      |           |          | \$ 19.81     |
| TOTAL SPECIFIED EXPENSES                                        |      |           |          | \$ 456.97    |
| RETURNS ABOVE TOTAL SPECIFIED EXPENSES                          |      |           |          | \$ 432.28    |
|                                                                 |      |           |          |              |
| RESIDUAL ITEMS                                                  |      |           |          |              |
| Management Charge                                               | %    | \$ 889.25 | 5%       | \$ 44.46     |
| LCB - Land Charge                                               | acre | \$ 75.00  | 1        | \$ 75.00     |
| RESIDUAL RETURNS                                                |      |           |          | \$ 312.82    |

## Results and Discussion

The cost estimates for alternative insurance policies and coverage levels are shown in Table 2 based on a 700 APH yield. This analysis was developed to show representative revenue guarantees, total premiums, subsidies and producer premiums for the three types of insurance policies over commonly selected yield guarantee levels of 65% to 85%. For the 2011 crop year, per acre guarantees ranged from \$505.05 per acre to \$660.45 per acre for YP contracts, \$637 per acre to \$833 per acre for RP contracts and \$505.05 per acre to \$660.45 per acre for RP+HPE contracts. Producer premiums for YP contracts ranged from \$25.21 per acre to \$82.29 per acre. Producer premiums for RP contracts range from \$33.40 per acre to \$106.70 per acre over the range of yield guarantee levels. Producer premiums for RP+HPE contracts ranged from \$28.24 per acre to \$91.71 per acre over the 65% to 85% yield guarantee range.

Table 2. Cost Estimates for Alternative Insurance Policy and Coverage Levels.

| Guarantee                 | 85%      | 80%      | 75%      | 70%      | 65%      |
|---------------------------|----------|----------|----------|----------|----------|
| Yield Protection          | \$660.45 | \$621.60 | \$582.75 | \$543.90 | \$505.05 |
| Revenue Protection        | \$833.00 | \$784.00 | \$735.00 | \$686.00 | \$637.00 |
| Revenue Protection w/ HPE | \$660.45 | \$621.60 | \$582.75 | \$543.90 | \$505.05 |
|                           |          |          |          |          |          |
| Total Premium             | 85%      | 80%      | 75%      | 70%      | 65%      |
| Yield Protection          | \$132.73 | \$110.65 | \$91.59  | \$75.31  | \$61.49  |
| Revenue Protection        | \$172.09 | \$144.58 | \$120.46 | \$99.43  | \$81.47  |
| Revenue Protection w/ HPE | \$147.92 | \$123.80 | \$102.58 | \$84.34  | \$68.87  |
|                           |          |          |          |          |          |
| Subsidy                   | 85%      | 80%      | 75%      | 70%      | 65%      |
| Yield Protection          | \$50.44  | \$53.11  | \$50.37  | \$44.43  | \$36.28  |
| Revenue Protection        | \$65.39  | \$69.40  | \$66.25  | \$58.66  | \$48.07  |
| Revenue Protection w/ HPE | \$56.21  | \$59.42  | \$56.42  | \$49.76  | \$40.63  |
|                           |          |          |          |          |          |
| Producer Premium          | 85%      | 80%      | 75%      | 70%      | 65%      |
| Yield Protection          | \$82.29  | \$57.54  | \$41.22  | \$30.88  | \$25.21  |
| Revenue Protection        | \$106.70 | \$75.18  | \$54.21  | \$40.77  | \$33.40  |
| Revenue Protection w/ HPE | \$91.71  | \$64.38  | \$46.16  | \$34.58  | \$28.24  |

Because of the common projected price, the yield protection under the COMBO policy is the same in the YP, RP, and RP+HPE contracts. Any additional premiums or additional indemnities that exceed those of YP are by definition for price risk only. The COMBO policy uses the YP contract as the base contract. The YP contract plus the Yield Adjusted Asian (YAA) call or harvest price and a Yield Adjusted Asian (YAA) put or revenue endorsement, is equal to the Revenue Protection (RP) contract. Cotton producers can delete the harvest price and create the Revenue Protection with the Harvest Price Excluded (RP+HPE) contract that equals YP plus the YAA put only (Barnaby).

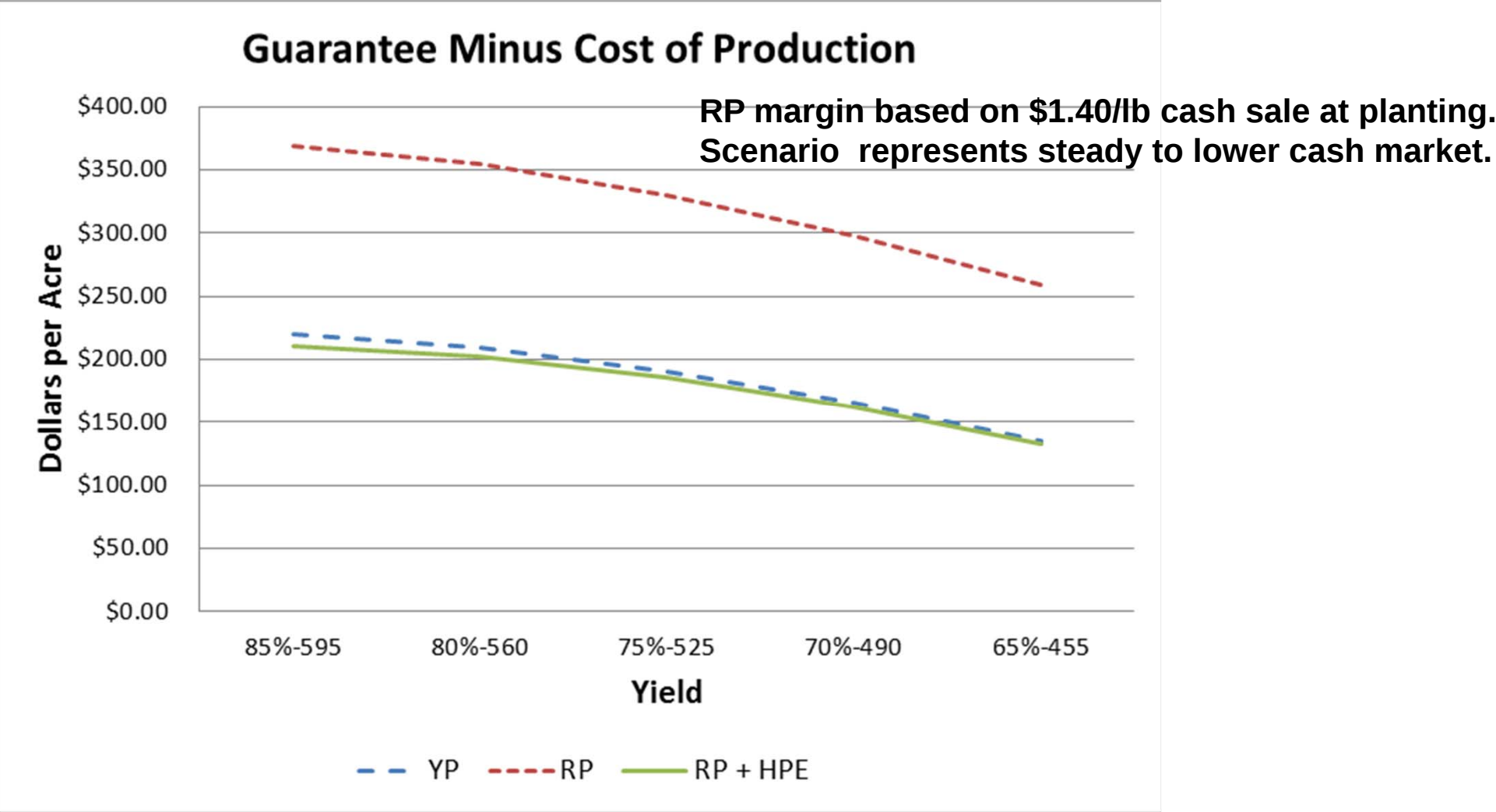
The structure of the COMBO policy allows for the calculation of the YAA Asian put option premium at the projected price over the range of coverage levels. These results are shown in Table 3. This calculation shows that the YAA Asian put option, or the downside price protection component is a small part of the insurance premium.

Table 3. Implied Yield Adjusted Asian Put Option Prices at the Projected Price per Pound.

| Guarantee         | 85%     | 80%     | 75%     | 70%     | 65%     |
|-------------------|---------|---------|---------|---------|---------|
| Implied Put Price | 0.01580 | 0.01220 | 0.00940 | 0.00760 | 0.00670 |

Figure 1 shows the alternative production margins that may be insured using the different products after adjusting for cost of insurance, harvest and management fees. As can be seen in Figure 1, the projected margins given a stable cotton market are substantial under the scenario that existed prior to planting the 2011 crop. Using the revenue protection contract, the producer under this scenario could guarantee margins ranging from \$255 per acre to \$370 per acre.

Figure 1. Projected Insurable Margins for 2011 Crop Based on the Cost Structure Shown in Table 1.



There are many factors that go into making the purchasing decision for crop insurance, and although the cotton market provided for much higher prices in the 2011 crop year, it is still instructive to examine the crop insurance decisions made by producers in the three major producing counties in the Lower Rio Grande Valley (LRGV) made up of Cameron, Hidalgo, and Willacy, and the two major producing counties in the Lower Coastal Bend (LCB), Nueces and San Patricio.

In 2009, the Farm Service Agency (FSA) reported that there were 69,463 certified acres of upland cotton planted in the LRGV. RMA reported that 69,108 acres of those upland cotton acres were insured in 2009, resulting in an insured rate of 99.5%. Of the 69,108 total insured acres, 6.5% of those acres were insured with a CRC contract. In 2011, the FSA reported that there were 193,537 certified acres of upland cotton planted in the LRGV. RMA reported that 188,514 acres of upland cotton were insured in 2011, for an insured rate of 97.4%. Of the insured acreage, 88.7% was covered with a YP contract, 10.9% was covered with a RP contract and 3.4% was covered with a RP+HPE contract. While the shares of revenue protection contracts increased slightly, LRGV cotton producers still purchased a very high percentage of YP contracts.

In 2009, the FSA reported that there were 266,091 certified acres of upland cotton production in the LCB. RMA reported that 262,761 acres of upland cotton were insured in 2009, resulting in an insured rate of 98.7%. Of the 262,761 total insured acres, only 0.86% of those acres were insured with a CRC contract. In 2011, the FSA reported that there were 276,675 certified acres of upland cotton planted in the LCB. RMA reported that 261,646 acres of upland cotton was insured in 2011, for an insured rate of 94.6%. Of the insured acreage, 47.6% was covered with a YP contract and 52.4% was covered with a RP contract. The adoption rate of revenue protection contracts was much higher by producers in the LCB as compared with producers in the LRGV.

## Conclusion

The CCIP or COMBO policy introduced by RMA appears to provide cotton producers in South Texas with a more consistent set of crop insurance products to choose from, with a great deal of flexibility to tailor a risk management program to their operations. While the recent release of the new products does not allow for a detailed analysis on adoption rates by South Texas cotton producers, producers in the LCB dramatically increased the number of RP contracts in 2011 relative to CRC contracts purchased in 2009.

## References

Barnaby, G.A. “Replace Loan and Cover Put Sales with a Disappearing Deductible in RP”. Kansas State University, Manhattan, KS 66506, April 18, 2011.

Edwards, William. “The New Common Crop Insurance Policy”. Ag Decision Maker, Volume 15, Number 2. Iowa State University, December, 2010.