

**MANAGING REVENUE RISK ON  
MISSISSIPPI COTTON FARMS**

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**Abstract**

Farmers must now bear all the burden of providing themselves with any type risk protection. Some of the new revenue insurance products provide additional means of doing this. This paper attempts to compare/contrast Crop Revenue Coverage with Multi-Peril Crop Insurance and an options contract.

**Introduction**

Risk results from our inability to accurately predict the future. Farming enterprises face many sources of risk. Crop yields, input costs, commodity prices and interest rates all vary over time. This variation can wreck havoc with economic decision-making.

How do farmers manage risk? Most farmers are already managing some of the risks associated with their operation. Irrigation equipment, crop diversity, new or additional equipment, forward contracts, futures/options, as well as different farm locations all help manage risks.

The FAIR Act has and will change the way farmers must manage risk. With the change from “deficiency” payments to “transition” payments to “no” payments, growers must provide and/or purchase their own risk protection. In addition to the changes of the FAIR Act, the Crop Insurance Reform Act has created a new risk environment for farmers. No longer can growers depend on the government to provide them with risk protection. Growers must now “manage” all of their risk themselves.

One of the questions growers must ask themselves is what is the best buy? Which product or program will provide the greatest risk protection for the money? There are some new products available called revenue insurance that may need to be considered in these decisions. The purpose of this paper is to examine the costs and coverages of Crop Revenue Coverage (one of the new revenue insurance products available for cotton in Mississippi in 1998). Crop Revenue Coverage will be compared/contrasted with Multi-Peril Crop Insurance and an options contract.

**Data and Methods**

Multi-Peril Crop Insurance and Crop Revenue Coverage prices and coverage levels for Mississippi Delta counties

were obtained from Mike Moore of the Federal Crop Insurance Commission. Options pricing and strategies were designed to mimic the Crop Revenue Coverage scenario as closely as possible. These prices and strategies were reviewed by Dr. O. A. Cleveland of Mississippi State University. Examples are based on a Mississippi Delta cotton farm with a 700 lb./acre actual production history.

**Discussion**

The 1996 Farm Bill changed the way farmers must look at risk. Farmers now bear all the burden of providing themselves with any type risk protection. When attempting to manage farm revenue risk, farmers must remember to manage both price and yield risk. Traditionally this has been accomplished separately i.e. one product/tool for price protection, another product/tool for yield protection. Some of the new revenue insurance products provide a means for managing both price and yield risk in one policy. All revenue insurance products provide a minimum revenue guarantee per acre. Basically this is accomplished by multiplying the actual production history yield x the price level x the coverage level. This dollar figure is the minimum revenue per acre for that policy. If actual revenue drops below this level due to a decrease in price or yield then an indemnity payment is received. Crop Revenue Coverage is the only revenue insurance product approved for Mississippi for 1998. Crop Revenue Coverage provides the minimum revenue as mentioned above, but also has the “potential” to pay more if the harvest price is higher than the pre-plant price. Revenue insurance products could be described as having Multi Peril Crop Insurance (MPCI) and a put option. With the ability of Crop Revenue Coverage to pay at a higher price (if harvest price is higher) it could be referred to as having MPCI plus a put and a call option. The question has been asked if farmers are better off with the package provided by CRC or with the purchase of each of the products separately. Examples and additional comments about these scenarios are given below.

**MPCI “Buy Up” Example**

Actual production history yield	700 lbs/acre
Coverage level	65%
Trigger yield (700 * 65%)	455 lbs/acre
Pre-plant price	\$.70/lb
Price coverage level	100%
Total coverage per acre	\$318.50/acre
If actual harvest is 300 lb/acre	(455-300)=155*.70/lb)
	\$108.50
Cost per acre	\$17

With a traditional “buy up” policy only yield risk is provided. The price level coverage is only used for computing the payment and is based off an average of the price at the time in which the contract is entered. The total coverage per acre of \$318.50 would be paid if the farmer had no yield (total loss) on the farm. Using an example yield of 300 lbs/acre, the indemnity is computed by subtracting the actual yield (300 lbs/acre) from the trigger yield (455 lbs/acre) and then multiplying this by the price coverage level (.70/lb.) for a total of \$108.50.

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### **Crop Revenue Coverage Example**

Actual production history yield	700 lbs/acre
Coverage level	65%
Pre-plant price	\$.70/lb.
Minimum revenue per acre (700 * 65% * .70/lb.)	\$318.50

Potential Revenue	
700 lbs/acre * 65% * harvest price (.75/lb.)	\$341.25

If actual harvest is 300 lb./acre	
300*.65=\$195.00 actual revenue	
\$318.50-\$195=	\$123.50
300*.70=\$210.00 actual revenue	
\$318.50-\$210.00=	\$108.50
300*.75=\$225.00 actual revenue	
\$341.25-\$225.00=	\$116.25

Cost per acre	\$24
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This CRC example uses the same farm yield levels and coverage levels. As mentioned earlier CRC provides a minimum revenue per acre. The price used to calculate this minimum revenue is 95% of the average cash price Jan. 15- Feb. 14. Multiplying the trigger yield (455 lbs/acre) times the price level (.70/lb) the minimum revenue per acre is obtained. If the actual revenue (actual yield x harvest price) is lower than this dollar amount an indemnity is paid. Actual revenue could be lower due to a price decrease or a yield loss, either way it does not matter. CRC also has the potential to provide or pay more if the harvest price is higher (calculated as the average of the Nov. daily cash prices) than the pre-plant price. Using .70/lb. as the pre-plant price CRC is compared with a .05/lb. drop in harvest prices (in which case the pre-plant minimum revenue is used to determine the indemnity payment) and with a .05/lb. increase in harvest prices (in which case the "potential" revenue is used and is calculated using .75/lb). Many different scenarios could be calculated using various yields and price levels not to mention other coverage levels. Farmers should use the situations, yield averages and price levels that most closely represent their farm.

### **Build Your Own**

"Buy up" insurance coverage based on previous example	\$17/acre
Purchase a Dec. put option (.75) = (.70 cash price)	
.0265 per pound * 455/acre =	\$12.00
Purchase a Dec. call option (.80) = (.75 cash price)	
.0220 per pound * 455/acre =	\$10.00
Total cost	\$39.00

Several things need to be considered in trying to compare CRC and a "build your own" program. The prices per acre for the put and call options are calculated using 455 lb/acre (even though the farm averages 700 lb/acre) because that is the per acre coverage that is provided in the "buy up" program. The prices for the put and call options were available in mid March 1997 (which would coincide with when the decision to purchase CRC might need to be made). The build your own program is considerably more expensive on a per acre basis. However it also provides some additional options. Mid March may not be the best time to purchase put or call options. Farmers might benefit from waiting and purchasing one or both of these options at a later time. Additionally, by having more time to decide, the farmer may or may not even purchase them. Also with the build your own program the farmer can benefit from either the put or call option and a high yield (with high yield he receives nothing from the "buy up" insurance program, but has the actual revenue provided by price protection and the high yield). The farmer might choose to purchase full coverage on the put and call options (based on 700 lbs/acre) and thus increase his opportunities even more, this would also increase the price. Another thing to consider is what happens in the case of a total loss (yield loss). With the build your own program the farmer would receive \$318.50 from the "buy up" insurance program and potentially some income from the options contract (depending on what price does). With the CRC program the farmer would receive either the minimum revenue or the "potential revenue"

(depending on what price does). Another thing to consider is the time and effort needed to build your own program. The ease of simply buying a Crop Revenue Coverage policy might be a plus to some growers.

### **References**

Cleveland, O. A. 1997. Mississippi State University. Personal Communication.

Moore, M. 1997. Federal Crop Insurance Commission. Personal Communication.

