



## Ag Policy Update: Stacked Income Protection Plan (STAX)

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### ***Background***

With cotton no longer considered a covered commodity in the 2014 Farm Bill and, therefore, not eligible to participate in the Agricultural Risk Coverage (ARC) or Price Loss Coverage (PLC) programs, the Stacked Income Protection Plan (STAX) was created to provide a level of safety net to upland cotton producers. While the ARC and PLC programs are designed to provide government payments on a percentage of a farm's base acres when either revenue or prices fall below some guaranteed level, STAX is a crop insurance program administered through USDA's Risk Management Agency (RMA). STAX works very much like many of the existing crop insurance programs providing an indemnity when actual crop revenue falls below a guaranteed level. However, unlike most existing revenue protection insurance policies, STAX considers area wide revenues rather than the producer's own individual revenue. In most cases, the area will be the county (parish) but it may include other counties or even practices as necessary to obtain a credible amount of data to establish an expected yield and premium rate. And, as with other crop insurance policies, producers will be required to pay a premium for STAX coverage. The difference being that the government will pay or subsidize 80 percent of the STAX premiums, which is a much higher subsidy level than on existing crop insurance policies.

### ***STAX Options***

When purchasing STAX, the producer will have to decide among several options. First, STAX will have to be chosen as a revenue protection or a revenue protection with a harvest price exclusion plan. The difference in the two is that under the revenue protection plan, the price used in determining the guaranteed revenue level is the higher of the projected price set by RMA (average of December Cotton Futures contract prices typically during the month of February) or the harvest price set RMA (average of December Cotton Futures contract prices typically during the month of October). For the revenue protection with a harvest price exclusion, the guaranteed revenue level is calculated using only the projected price. If the harvest price is lower than the projected price, then the two versions result in the same level of revenue guarantee. If, however, the harvest price turns out to be larger than the projected price, then the revenue protection version of STAX would be based on a higher revenue guarantee level.

The second choice that producers must make regarding STAX is the area loss trigger level. The area loss trigger level is the level at which STAX begins to provide coverage. This trigger level can be selected at levels ranging from 75% up to 90% in 5% increments. So, for example, if a producer selects an area loss trigger level of 80%, then STAX would begin to provide loss payments when area revenue fell below 80% of its expected level. Once, the area loss trigger level is selected, the coverage range provided by STAX can also be determined. The coverage range is set at the difference between the area loss trigger and the higher of either the coverage level of a companion insurance policy or 70%. The 70% level is the lower level loss trigger and is fixed at this level by the 2014 Farm Bill.

STAX can be purchased either as a standalone insurance policy or in combination with other existing crop insurance instruments including Yield Protection, Revenue Protection, Revenue Protection with the Harvest

Price Exclusion, and any of the Area Risk Protection Insurance policies. If a producer chooses to purchase STAX as a standalone policy, then the coverage range is the difference between the producer's choice of the area loss trigger and the lower level loss trigger (70%). So, for example, if the producer chose an area loss trigger of 90% and was purchasing STAX as a standalone policy, then the coverage range would be 20% (90% - 70% = 20%). In this example, STAX would begin to provide loss payments when area revenue fell below 90% of its expected level and would continue to provide coverage as area revenue fell to 70% of its expected level. If, on the other hand, assume the example producer purchased a revenue protection policy at the 75% coverage level as a companion policy to the STAX policy and again chose the 90% area loss trigger level. In this case, the coverage range for STAX would be 15% (90% - 75% = 15%). The revenue protection coverage level (75%) would be used to determine the coverage range because it was larger than the lower level loss trigger of 70%. So, for this example, STAX would begin to make loss payments once area revenue falls below 90% of its expected revenue and would continue to provide coverage as area revenue falls to 75% of its expected revenue. Losses below the 75% level would be expected to be covered by the revenue protection policy purchased by the producer.

The third option that a producer must make when purchasing STAX coverage is choosing a protection factor. The protection factor can take a value from 80% to 120% in increments of 1%. The protection factor is multiplied by the expected area revenue and the coverage range to determine the maximum indemnity that could be provided under STAX coverage. As such, the higher the protection factor chosen, the higher level of potential coverage provided by STAX.

As indicated, the amount of coverage provided by STAX is determined by the choices made by producers. In terms of maximizing the coverage provided by STAX, it is fairly obvious that a producer would choose the revenue protection version of STAX and choose the maximum levels for both the area trigger loss and the protection factor. While these choices will provide the most potential coverage, it will also likely be associated with the highest premiums. The costs associated with STAX will be dependent on the area (parish), coverage range selected, and the protection factor. So, the producer must weigh between the costs of purchasing STAX versus the amount of coverage being offered.

### **How Does STAX Work?**

As mentioned previously, the amount of coverage being offered by a STAX policy will depend on the choices made by the producer and the historic area revenue. The maximum level of coverage offered by a particular STAX policy is calculated as:

$$\text{Maximum STAX Indemnity} = \text{Coverage Range} * \text{Expected Crop Value} * \text{Protection Factor.}$$

This provides the largest level of indemnity that the producer could expect from the STAX policy. For example, assume a producer only purchases STAX as a revenue protection plan and chooses an area loss trigger of 85% and a protection factor of 110%. Also assume that the producer operates in an area (parish) in which RMA has established an expected area (parish) yield of 725 pounds, a projected price of \$0.70 per pound, and a harvest price of \$0.68 per pound. The maximum STAX indemnity would be:

$$\text{Maximum STAX Indemnity} = \text{Coverage Range} * \text{Expected Crop Value} * \text{Protection Factor.}$$

$$= 15\% * \$507.50 * 110\% = \$83.74$$

Since the STAX policy was a standalone policy, the coverage range was the difference between the chosen area loss trigger (85%) and the lower level loss trigger of 70%. Also, since STAX was chosen as a revenue protection plan, the expected crop value was the expected parish yield times the higher of the projected price or the harvest price. In this case it was the parish yield times the projected price or 725 pounds times \$0.70

per pound. The end result shows that the producer would have a maximum STAX indemnity of \$83.74 per acre.

The final indemnity that a producer would receive could range from zero up to the maximum STAX indemnity depending on how far actual parish revenue fell below its expected level. This is determined by what is termed as the payment factor. The payment factor is calculated as:

$$\text{STAX Payment Factor} = \frac{(\text{Area Loss Trigger} - (\text{Final Parish Revenue} / \text{Expected Parish Revenue}))}{\text{Coverage Range}}$$

The final parish revenue would simply be the final parish yield set by RMA times the harvest price, also set by RMA. The expected area revenue could vary slightly depending on whether the producer chooses STAX as a revenue protection plan or as a revenue protection with a harvest price exclusion plan. As a revenue protection plan, STAX would calculate the expected parish revenue as the expected parish yield set by RMA times the higher of the projected price or harvest price. As a revenue protection with a harvest price exclusion, STAX would calculate the expected parish revenue by simply multiplying the expected parish yield times the projected price. So, for our example producer with a maximum STAX indemnity of \$83.74, assume that RMA has released an average parish yield of 609 pounds per acre and a harvest price of \$0.68 per pound. For this example, the STAX payment factor would be:

$$\text{STAX Payment Factor} = \frac{(85\% - (\$414.12 / \$507.50))}{15\%} = 0.2267$$

The final parish revenue is simply the final average parish yield times the harvest price (620 lbs \* \$0.68 = \$421.60). Again, since the example producer chose STAX as a revenue protection plan, the expected parish revenue is the expected parish yield times the higher of the projected price or the harvest price. Since the projected price in the example was higher than the harvest price, the expected area revenue would be 725 pounds times \$0.70 per pound or \$507.50. When the mathematics is completed, the payment factor is found to be 0.2267. The payment factor is restricted to a value between 0 and 1.

Once the maximum STAX indemnity is known and the payment factor is known, the actual or final indemnity payment available to a producer can be calculated. The final STAX indemnity can be calculated as:

$$\text{Final STAX Indemnity} = \text{Maximum STAX Indemnity} * \text{Payment Factor}$$

In keeping with the example farm with a maximum STAX indemnity of \$83.74 and a payment factor of 0.2267, , the final STAX indemnity would be:

$$\text{Final STAX Indemnity} = \$83.74 * 0.2267 = \$18.98$$

So, the example producer would receive a STAX indemnity of \$18.98 per acre. In this example, the final parish revenue (\$414.12) was roughly a 18% reduction from the expected parish revenue (\$507.50) and resulted in an indemnity of \$18.98 per acre. Since STAX is based on parish revenue levels, the producer could have had above average yields and still would be eligible for a STAX indemnity.

Additional examples of how STAX works as a standalone policy or as a companion policy with some other crop insurance instrument can be found in the Appendix of this report.

## Final Comments

As mentioned earlier, STAX is scheduled to be available starting with the 2015 cropping year. Based on information from RMA, there will be 23 parishes in Louisiana in which STAX will be available. The parishes reported to have STAX available in 2015 are:

Avoyelles	Bossier	Caddo	Caldwell	Catahoula	Concordia
De Soto	East Carroll	Evangeline	Franklin	Grant	LaSalle
Madison	Morehouse	Natchitoches	Ouachita	Pt. Coupee	Rapides
Red River	Richland	St. Landry	Tensas	West Carroll	

Producers interested in purchasing STAX for the 2015 crop would purchase it in the same way as for any crop insurance policy through your crop insurance agent. If a producer chooses to purchase STAX in combination with another insurance policy, STAX must be purchased by the sales closing date of the companion policy and with the same insurance company.

Producers interested in learning more about the STAX program are encouraged to contact their crop insurance agent or RMA. The RMA website has a crop insurance decision tool that allows producers look at the different crop insurance and STAX combinations. That decision tool can be accessed at the following website:

<http://prodwebnlb.rma.usda.gov/apps/CIDT/>

# Appendix

## Example 1

### Standalone STAX Coverage

Assume a producer wants to purchase STAX coverage for his cotton crop on a particular farm. The producer decides that he will purchase STAX as a standalone policy. After examining the options available to him, the producer is able to develop the following information:

Expected Parish Yield:	850
Projected Price:	\$0.68
Area Loss Trigger Chosen:	90%
Lower Level Loss Trigger:	70%
Protection Factor Chosen:	100%

At the end of the cropping year, the producer was able to obtain the following decision.

Final Parish Yield:	714
Harvest Price:	\$0.62

Given the producer's selections and the final parish yield and price, the producer would be eligible for the following:

#### STAX As A Standalone Policy

<b>STAX - Revenue Protection Plan</b>	
Coverage Range (Area Loss Trigger - Lower Level Loss Trigger)	20.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Higher of Projected Price or Harvest Price) * Protection Factor)	\$115.60
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.6706
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$77.52
<b>STAX - Revenue Protection with Harvest Price Exclusion Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	20.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Projected Price) * Protection Factor)	\$115.60
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.6706
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$77.52

For this example, the producer would receive an indemnity of \$77.52 per acre regardless if he chose STAX as a Revenue Protection or a Revenue Protection with a Harvest Price Exclusion plan. The indemnity is the same in both cases because the harvest price was lower than the projected price.

## Example 2

### Standalone STAX Coverage

Assume a producer wants to purchase STAX coverage for his cotton crop on a particular farm. The producer decides that he will purchase STAX as a standalone policy. After examining the options available to him, the producer is able to develop the following information:

Expected Parish Yield:	675
Projected Price:	\$0.65
Area Loss Trigger Chosen:	80%
Lower Level Loss Trigger:	70%
Protection Factor Chosen:	110%

At the end of the cropping year, the producer was able to obtain the following decision.

Final Parish Yield:	486
Harvest Price:	\$0.69

Given the producer's selections and the final parish yield and price, the producer would be eligible for the following:

#### STAX As A Standalone Policy

<b>STAX - Revenue Protection Plan</b>	
Coverage Range (Area Loss Trigger - Lower Level Loss Trigger)	10.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Higher of Projected Price or Harvest Price) * Protection Factor)	\$51.23
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.8000
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$40.99
<b>STAX - Revenue Protection with Harvest Price Exclusion Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	10.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Projected Price) * Protection Factor)	\$48.26
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.3569
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$17.23

For this example, the producer would receive an indemnity of \$40.99 per acre if he purchased STAX as a revenue protection plan or \$17.23 per acre if he purchased STAX as a revenue protection with harvest price exclusion plan. Since the harvest price was higher than the projected price, the maximum STAX indemnity and the payment factor were larger for the revenue protection plan since the revenue protection with a harvest price exclusion plan is forced to use the lower projected price.

### Example 3

#### STAX Coverage with a Companion Revenue Protection Insurance Policy

Assume a producer wants to purchase STAX coverage for his cotton crop on a particular farm along with a revenue protection policy as a companion policy. After examining the options available to him, the producer is able to develop the following information:

Producer's APH Yield:	925
Expected Parish Yield:	705
Projected Price:	\$0.70
Area Loss Trigger Chosen:	90%
Lower Level Loss Trigger:	70%
Companion Policy Coverage Level:	75%
Protection Factor Chosen:	120%

At the end of the cropping year, the producer was able to obtain the following decision.

Final Producer Yield	680
Final Parish Yield:	649
Harvest Price:	\$0.71

Given the producer's selections and the final parish yield and price, the producer would be eligible for the following:

#### STAX With A Revenue Protection Companion Policy

<b>STAX - Revenue Protection Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	15.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Higher of Projected Price or Harvest Price) * Protection Factor)	\$90.10
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.0000
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$0.00
<b>STAX - Revenue Protection with Harvest Price Exclusion Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	15.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Projected Price) * Protection Factor)	\$88.83
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.0000
STAX Indemnity (Maximum STAX Indemnity * Payment Factor)	\$0.00
<b>Companion Revenue Protection Insurance Policy</b>	
Guaranteed Revenue Level (Producer's APH * Higher of Projected Price or Harvest Price * Policy Coverage Level)	\$492.56
Actual Revenue Level (Final Producer's Yield * Harvest Price)	\$482.80
Companion Revenue Protection Policy Indemnity (Guaranteed Revenue Level - Actual Revenue Level)	\$9.76

For this example, the producer would not receive an STAX indemnity because the final parish revenue did not fall far enough from the expected level. No STAX indemnity would be available regardless if the producer chose STAX as a revenue protection plan or a revenue protection with a harvest price exclusion plan. The producer would, however, receive an indemnity of \$9.76 per acre from the companion revenue protection policy that was purchased in addition to the STAX policy. In this example, the producer's actual revenue fell below the guaranteed revenue level and resulted in an indemnity of \$9.76 per acre.

## Example 4

### STAX Coverage with a Companion Revenue Protection Insurance Policy

Assume a producer wants to purchase STAX coverage for his cotton crop on a particular farm along with a revenue protection policy as a companion policy. After examining the options available to him, the producer is able to develop the following information:

Producer's APH Yield:	700
Expected Parish Yield:	680
Projected Price:	\$0.68
Area Loss Trigger Chosen:	90%
Lower Level Loss Trigger:	70%
Companion Policy Coverage Level:	70%
Protection Factor Chosen:	110%

At the end of the cropping year, the producer was able to obtain the following decision.

Final Producer Yield	425
Final Parish Yield:	544
Harvest Price:	\$0.71

Given the producer's selections and the final parish yield and price, the producer would be eligible for the following:

#### STAX With A Revenue Protection Companion Policy

<b>STAX - Revenue Protection Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	20.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Higher of Projected Price or Harvest Price) * Protection Factor)	\$106.22
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.5000
STAX Indemnity (Maximum STAX Idemnity * Payment Factor)	\$53.11
<b>STAX - Revenue Protection with Harvest Price Exclusion Plan</b>	
Coverage Range (Area Loss Trigger - Higher of the Lower Level Loss Trigger or the Companion Policy Coverage Level)	20.00%
Maximum STAX Indemnity (Coverage Range * (Expected Area Yield * Projected Price) * Protection Factor)	\$101.73
Payment Factor ((Area Loss Trigger - (Final Parish Revenue / Expected Parish Revenue))/Coverage Range)	0.3235
STAX Indemnity (Maximum STAX Idemnity * Payment Factor)	\$32.91
<b>Companion Revenue Protection Insurance Policy</b>	
Guaranteed Revenue Level (Producer's APH * Higher of Projected Price or Harvest Price * Policy Coverage Level)	\$347.90
Actual Revenue Level (Final Producer's Yield * Harvest Price)	\$301.75
Companion Revenue Protection Policy Indemnity (Guaranteed Revenue Level - Actual Revenue Level)	\$46.15

For this example, the producer would receive a STAX Indemnity of \$53.11 per acre if the producer would have chosen STAX as a revenue protection plan or an indemnity of \$32.91 per acre if he had chosen it as a revenue protection with a harvest price exclusion plan. Under both STAX plans, the actual parish revenue fell far enough below the expected parish revenue level to generate an indemnity. The STAX indemnity under the revenue protection plan would generate a higher indemnity because the harvest price was higher than the projected price. In addition to the STAX indemnity, the producer would also receive an indemnity of \$46.15 per acre from the companion revenue protection policy that was also purchased. The producer's actual revenue fell below the guaranteed level of the revenue protection policy and, therefore, resulted in an indemnity of \$46.15 per acre. In total the producer would receive indemnity payments of \$99.26 (STAX indemnity plus companion policy indemnity) if the producer chose the revenue protection plan for STAX or \$79.06 per acre if the producer chose the revenue protection with harvest price exclusion plan for STAX.