

Factors to Consider when Selecting a Crop Insurance Policy



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Cotton producers are exposed to significant risks throughout the production year. These risks are typically larger and more extensive than those faced by producers of other major row crops due to the comparatively large capital investments in specialized equipment, practices, and inputs required to produce cotton competitively. It is critical that cotton producers be aware of effective risk management alternatives and use them appropriately. The purpose of this publication is to identify important factors that producers should consider when selecting a crop insurance policy. This publication is intended as a guideline for producers and not a decision aid. Producers should consult their insurance agent before making insurance policy purchases

Need for Risk Protection

The first factor to be considered when evaluating an insurance policy is the need for risk protection. Risk is commonly defined as a part of the business decision that a manager has no control over. For cotton and row-crop producers, decisions related to input prices, interest rates, and production that are affected by weather are generally defined as risky decisions. Every individual has a different attitude toward exposure to unknown events or risks. This basic attitude toward risk is known as a risk preference. Many things, including the financial position of the producer and exposure to other risks, may influence a person's risk preference. A more strongly risk-averse producer would tend to be more comfortable with a higher level of crop insurance protection, while a less risk-averse producer would be inclined to purchase a lower level of protection.

Another item to be considered is the existence of off-farm income, savings, and/or diversification. Many farming households receive income from off-farm employment of the producer, the spouse, or both. If a significant portion of the total household income is derived from off-farm employment, then a lower level of crop insurance protection may be acceptable. Savings accounts and diversification have a similar effect. Large savings or diversification in other industries reduces the risk of an inability to pay for the cost of producing a crop.

Different types of crop insurance policies have been developed to allow producers to tailor their risk management programs to their risk preferences. These products include yield protection (YP), revenue protection (RP), and revenue protection with harvest price exclusion (RP-HPE). Another alternative may be to purchase catastrophic insur-

ance (CAT), which provides a low coverage level and price guarantee at a very low cost. If the producer's only real concern is the total loss of a crop, then the CAT insurance policy proves to be a low level of risk protection for just a few dollars.

Unit Structure Availability

Different types of crop insurance policies have different unit structures. The unit structure impacts the size of the premium a producer pays for a specific level of coverage. It is important that producers understand the concept of unit structure and then choose their insurance policies according to what best meets their individual needs.

The term *unit* or *insurance unit* refers to a parcel of land that is insured separately from other parcels. An individual farm may be divided into several units defined by ownership or lease arrangements, management practices, or location. Four alternative unit structures are available under various types of crop insurance coverage: basic units, optional units, enterprise units, and whole farm units. Producers may be able to receive a discount on their premium if they are able to move toward a larger insurance unit. It should be noted, however, that not all unit structures are permissible for every type of insurance. For example, yield protection coverage is not available on whole farm units. **Table 1** identifies the available unit structures for each of the types of crop insurance available on cotton.

Table 1. Available unit structure for different types of crop insurance products.

	Types of Units			
	Basic	Optional	Enterprise	Whole Farm
CAT	Yes			
YP	Yes	Yes	Yes	
RP	Yes	Yes	Yes	Yes
RP-HPE	Yes	Yes	Yes	Yes

Correlation with Area Production

Group insurance policies such as the Area Risk Protection Insurance Policy (ARPI) are available in some areas and provide a lower-cost risk management alternative. Group insurance policies pay indemnities based on county production averages. Individual producer actual yields are not used; rather, the county average yield determines losses.

In evaluating a group insurance policy, producers must account for how their yields relate with the yields of other area producers to effectively choose the most suitable insurance policy. If a producer's individual production on a yearly basis is consistent or follows county production trends fairly closely in direction and magnitude, then a group insurance policy could be an attractive option. Conversely, if a producer's production has a weak relationship with area production, then group policies are not likely to be an effective risk management tool.

Government Price Support Programs

Government price support programs represent another potential source of risk protection for producers. Consider the federal marketing loan program. If price falls below a set loan rate, then a payment is made. When this occurs, this program covers much of the price risk facing producers. During periods that the marketing loan program is making payments, the price risk protection of revenue insurance policies is redundant. Predicting prices and potential government loan payments very far into the future is extremely difficult. However, when the likelihood of prices below the loan rate seems high, then straight yield policies become more attractive risk management instruments.

Shallow Loss Programs

The Agricultural Act of 2014 provides a producer the opportunity to layer two insurance policies on the same acre of a crop. This layering allows for individual coverage (YP, RP, RP-HPE) for "deep losses" and either supplemental coverage option (SCO) or stacked income protection (STAX) for "shallow losses." In effect, SCO and STAX cover a portion of the deductible not covered by the individual coverage policy.

SCO is available for most program crops, while STAX is only available for cotton. Both SCO and STAX are triggered by county yields rather than farm yields, and both function similarly to the area revenue insurance products (ARPI) that were already available. The key difference between ARPI and SCO or STAX insurance is that SCO and STAX are restricted to cover only shallow losses

SCO provides an indemnity payment when market revenue measured at the county level falls below 86 percent of the expected county revenue as determined from county yield histories and futures prices. The payment size is determined by the proportion of the range of the loss below 86 percent down to the nominal coverage level of the producer's farm-level crop insurance. A producer would pay 35 percent of the actuarially fair premium (100–65 percent subsidy).

STAX is similar in structure to SCO in that indemnities are based on actual revenue relative to expected revenue at the county-level. The top coverage for STAX is 90 percent rather than 86 percent. The coverage range is limited to be no more than from 90 percent of expected county revenue down to 70 percent of expected county revenue in 5 percent increments. The use of a multiplier allows a producer to increase the amount of insurance by up to 120 percent of expected county revenue. The subsidy rate for STAX is 80 percent for all coverage levels, and the producer is not required to buy an underlying individual coverage policy.

Crop Insurance and Marketing Strategies

Producers also need to consider how a particular crop insurance product will fit into their overall marketing plan. Revenue insurance products provide some level of price protection while yield insurance products do not. Producers should think about how the coverage offered through their chosen insurance product may complement or substitute for other price protection strategies such as forward contracting or using futures and options.

Need for Special Features

Another major factor to be considered when deciding on the insurance product or coverage level is the need for special features. Special features include provisions related to replanting, prevented planting, and alternative farm practices such as irrigation and double-cropping. When any of these items are a concern, a producer must consider which type of insurance policy offers such features.

Regarding specialized farming practices such as irrigation and double-cropping, producers must be sure to select insurance policies that allow for such practices. For example, if a producer wants to begin irrigating a cotton crop in a county that has otherwise traditionally been strictly nonirrigated, purchasing a nonirrigated insurance policy would not be as valuable due to the lower yields typically associated with nonirrigated cotton.

Replanting and prevented planting features in regions with uncertain early-season weather have proven to be valuable to producers. A producer must consider geographic and topographic conditions when determining the importance of these features. If a producer consistently struggles with suitable planting weather due to fluctuating temperatures, excessive rainfall, or other environmental conditions, then an insurance policy containing replanting and prevented planting provisions could be very valuable.

The need for special features in a policy can affect not only the choice of policy type but also the choice of coverage level for any given policy. For example, replanted and prevented planting provisions will not be available on CAT coverage.

Coverage Level

Producers may wonder about what coverage level to select for a given crop insurance policy. Selecting a coverage level involves weighing a tradeoff between a higher level of protection and a higher total premium. Additionally, the decision may be influenced by the portion of the premium that is subsidized. The higher the coverage level, the lower the amount of the premium that is subsidized by USDA. **Table 2** shows premium subsidy factors by coverage level. These factors represent the percent of the total premium that is paid by USDA.

Since premiums are designed to be actuarially fair, the higher indemnity payments associated with higher coverage levels should nearly be offset by the higher premiums. The decision of what coverage level to select is mainly influenced by an individual producer's attitude toward risk and ability to withstand risk. The financial position of the operation is a key factor to consider. An example will help to illustrate this point. This example uses a RP policy;

Table 2. Subsidy levels for alternative unit structures and products.

Coverage Level (%)	Basic & Optional (%)	Enterprise Unit (%)	SCO Subsidy (%)	STAX Subsidy (%)
50	67	80	65	n/a
55	64	80	65	n/a
60	64	80	65	n/a
65	59	80	65	n/a
70	59	80	65	80
75	55	77	65	80
80	48	68	65	80
85	38	53	65	80
86	n/a	n/a	65	80
90	n/a	n/a	n/a	80

however, the principles illustrated here are relevant to any type of policy.

Consider the case of a producer growing cotton with an APH of 800 pounds per acre. Suppose that the RMA-established base price for cotton in the spring is \$0.78 per pound. The producer is interested in purchasing an RP policy. In this producer's county, RP coverage can be purchased at levels from 50 percent to 85 percent of expected revenue. At the 60 percent coverage level, for example, the producer's per-acre revenue guarantee would be

$$1) 800 \times 0.60 \times \$0.78 = \$374.40 \text{ per acre.}$$

Assuming that the total premium for this coverage (not including the administrative fee) worked out to \$40 per acre, the producer's portion of the premium would be \$40 - (\$40 x 0.64) = \$14.40 per acre.

At the 80 percent coverage level, the producer's per-acre revenue guarantee would be

$$2) 800 \times 0.80 \times \$0.78 = \$499.20 \text{ per acre,}$$

assuming a total premium of \$88 per acre, the producer's portion of the premium would be \$88 - (\$88 x 0.48) = \$45.76 per acre. Taking into account the differences in premium, the 80 percent coverage level provides \$93.44 per acre more protection than the 60 percent coverage (i.e., [499.20 - 374.40] - [45.76 - 14.40] = \$93.44).

Suppose next that, due to locally wet weather late in the year, the producer experiences a significant loss in production, picking just 500 pounds of cotton per acre. Suppose also that the cotton market has improved somewhat from earlier in the year so that the harvest price is \$0.85 per pound. The producer's final revenue guarantee under the terms of an RP policy would be

$$3) 800 \times 0.60 \times \$0.85 = \$408.00 \text{ per acre}$$

at the 60 percent coverage level and

$$4) 800 \times 0.80 \times \$0.85 = \$544.00 \text{ per acre}$$

at the 80 percent coverage level. Accounting for premium differences, the final guarantee on the 80 percent coverage is \$104.64 per acre higher than the final guarantee on the 60 percent coverage [i.e., [(\$544.00 - \$408.00) - (\$45.76 - \$14.40)] = \$104.64]. The producer's actual revenue (for crop insurance purposes) is

$$5) 500 \times 0.85 = \$425.$$

In this example, if the producer had purchased an RP policy at the 60 percent coverage level, no indemnity would be received; however, an RP policy with 80 percent coverage would pay the producer an indemnity of \$119 per acre (the \$544 final guarantee minus the producer's actual revenue of \$425).

The point of this illustration is not that higher coverage levels are better than lower coverage levels. Indeed, if premiums are actuarially fair, then, on average, the higher indemnities associated with higher coverage levels will be just covered by the higher premiums associated with those coverage levels. The focus of this illustration is that the choice of coverage level can, at times, have an important impact on a producer's financial position. If, for instance, the producer in this example must generate revenues of at least \$375 per acre in order to cover most production costs, then he or she should by all means consider a coverage level that will provide that. On the other hand, if the producer's financial position is such that major loss will not jeopardize the survivability of the operation, then the additional expense for higher coverage levels may not be justified.

Shallow Loss Coverage Example

Beginning in the 2015 crop year, cotton producers will have the opportunity to participate in the STAX program, which can impact the crop insurance coverage selection decision. Participation in the STAX program does not require having an underlying crop insurance policy.

An example of how the STAX program works in the case where the producer selects a 100 percent STAX protection factor and the 70 percent STAX coverage level is shown below in **Table 3**. The expected county income per acre (\$828.36) is first calculated by multiplying the expected county yield (1,062 pounds per acre) by the insurance projected price (\$0.78 per pound). The income level (\$745.52 per acre) that would trigger a STAX indemnity is then calculated by multiplying the expected county income by 90 percent. The lowest STAX income guarantee is calculated by multiplying the expected county income by 70 percent. The maximum STAX indemnity is calculated

Table 3. STAX example.

Insurance projected price	\$0.78
Expected county yield	1,062
Expected county income	\$828.36
STAX protection factor	100%
STAX upper coverage	90%
STAX lower coverage	70%
Income level triggering STAX indemnity	\$745.52
Lowest STAX income level guarantee	\$579.85
Maximum indemnity	\$165.67
Insurance harvest price	\$0.80
Actual county yield	700
Actual county income	\$560.00
County indemnity	\$165.67
Indemnity with 100% protection factor	\$165.67

by subtracting the lowest STAX income guarantee from the STAX trigger (\$745.52 - \$579.85 = \$165.67 per acre). In this example, the actual county income (\$560.00 per acre) is calculated by multiplying the insurance harvest price (\$0.80 per pound) by the actual county yield (700 pounds per acre). The county indemnity of \$165.67 per acre in this example is calculated by taking the smaller of the maximum STAX indemnity (\$165.67 per acre) or the difference (\$185.52 per acre) between the STAX trigger (\$745.52) less the actual county income (\$560.00 per acre).

Cotton producers have the option to participate in the SCO program on acreage that is not enrolled in the STAX program. The SCO program does require that the producer have an underlying crop insurance policy, and the SCO program will take on the characteristics of the underlying crop insurance policy. An example of how the SCO program works, assuming a 70 percent RP policy with a 1,000-pound APH and a 650-pound actual yield is shown in **Table 4**. The expected county revenue (\$828.36 per acre) is calculated by multiplying the expected county yield (1062 pounds per acre) by the expected county price (\$0.78 per pound). The SCO trigger (\$712.39 per acre) is calculated by multiplying the expected county revenue by 86 percent. The SCO payment factor is calculated by first dividing the actual county revenue (700 pounds per acre times \$0.80 per pound = \$560 per acre) by the expected county revenue (\$560/828.36 = 67.6 percent), then subtracting that percentage from the SCO trigger of 86 percent (86 percent - 67.6 percent = 18.4 percent). Next, the difference in the expected return (18.4 percent) is divided by the difference in the SCO trigger and the underlying crop insurance policy's coverage level (86 percent - 70 percent = 16 percent), which results in a calculated SCO payment factor of 1.15. However, the SCO payment factor cannot exceed 1, so, in this case, 1 is substituted for 1.15 as the SCO payment factor. Because this example is based on an RP policy, the SCO liability per acre (\$128.00) is calculated by multiplying the farm APH (1,000 pounds per acre) by the larger of the base insurance price (\$0.78 per pound) or harvest insurance price (\$0.80 per pound) by the difference in the SCO trigger (86 percent) less the producer's crop insurance coverage level (70 percent). The SCO payment (\$128.00 per acre) is calculated by multiplying the SCO payment factor (1) by the SCO liability (\$128.00 per acre).

In addition to the SCO payment, the producer would also receive a \$40.00 per acre indemnity from the under-

lying RP policy. That RP policy indemnity is calculated as the difference between the final RP guarantee [APH of 1,000 pounds per acre times 70 percent coverage level times harvest price (\$0.80 per pound) = \$560 per acre] less the producer revenue to count (650 pounds per acre times \$0.80 per pound = \$520 per acre).

Table 4. SCO example.

Expected county yield	1,062
Expected county price	\$0.7800
Expected county revenue	\$828.36
SCO trigger (86%)	\$712.39
County actual yield	700
County harvest price	\$0.8000
Actual county revenue	\$560.00
Harvest insurance price	\$0.8000
SCO payment factor	1
SCO liability per acre	\$128.00
SCO payment	\$128.00
Producer APH	1,000
Base insurance price	\$0.7800
RP coverage level	70%
RP guarantee	\$546.00
SCO deductible range covered	\$124.80
Producer actual yield	650
Final RP guarantee	\$560.00
Producer revenue to count	\$520.00
RP indemnity	\$40.00

Conclusions

Crop insurance represents an important risk-management tool for cotton producers. However, the decision regarding what type of crop insurance policy and what level of coverage to purchase can be quite complex. It is important for producers to carefully evaluate their coverage needs, taking into consideration any need for special provisions, marketing plans, participation in other government programs, and their current financial position. The goal should be to purchase a policy that provides adequate coverage that is cost effective and that integrates well with the other management strategies and objectives of the operation.

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