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Farmers Who Cancel Their Revenue Coverage will only Save 2 Cents![1]

The current premiums for crop insurance have nearly doubled from a year ago primarily because of increased corn and soybean prices. As a result some insurance agents have suggested to clients they change from revenue coverage to yield only coverage, especially to those farmers who do not forward price any of their crop. **But does it make sense to eliminate the price protection from their crop insurance contract?**

The crop insurance price election has increased from $3.99 ($3.90 for YP (APH)) to currently about $6 for corn. The other major change was the new Common Crop Insurance Policy (CCIP) that replaced APH, Revenue Assurance, Crop Revenue Coverage and Income Protection, uses a common crop insurance price election in Yield Protection (YP), Revenue Protection (RP) and Revenue Protection with the Harvest Price Excluded (RP-HPE). The effect of a common price election is that all three contracts have the same yield protection, i.e. if the harvest price is lower than the price election and the yield is zero, then the indemnity payment will be the same for all three contracts.

As a result of the common yield guarantee, any increase in premiums or indemnity payments greater than YP's premiums and indemnities, are caused by just price risk. Effectively RP is YP plus a Yield Adjusted Asian put (YAA put) (revenue endorsement) and plus a Yield Adjusted Asian call (YAA call) (harvest price endorsement). The YAA put protects against falling prices and YAA call protect against price increasing and

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eliminates any negative values in the YAA put. Details on the negative values in the YAA put that is included in the RP-HPE is posted on AgManager.info at: http://www.agmanager.info/crops/insurance/risk_mgt/rm_pdf10/AB_2011_CropIns.pdf

While these options built into RP are similar to CME options traded in Chicago, there are some large differences. The "Asian" option is settled on an average price while a CME option is settled on the price at the time of sale, or spot price (Table 1). However, the major difference in risk value and premium cost of the YAA options built into RP are caused by adjustment for yield. For example if the market increases a dollar above the RP price election, then the CME call with a strike price equal to the RP price election will increase by a dollar plus time value. However the YAA call will only equal the CME call intrinsic value at zero yield and the YAA put will equal the CME put intrinsic value at the guaranteed bushel level. There is no time value in the YAA options. An in the money YAA call will expire worthless if yields exceeds the bushel guarantee. An in the money YAA put will expire worthless if yield equals zero or if yield increases above the guaranteed bushels. The amount of yield increase needed to cause the YAA put to expire worthless will depend on the severity of the price decline.

Comparing YAA options with CME options. A central Kansas Corn farmer with a 110 bushel APH and 75% enterprise coverage would have a yield guarantee of 82.5 bushels. To calculate the premium costs for the YAA put one would compare the YP with RP-HPE premiums. This example farmer's premium for 75% coverage YP versus RP-HPE was $12.47 versus $13.49, respectively. The YAA put premium equals the RP-HPE premium equal to $13.49 minus YP premium equal to $12.47 equals $1.02 divided by 82.5 bushels equals 1.2 cent per bushel. This example farmer's premium for 75% coverage RP-HPE versus RP was $13.49 versus $18.36, respectively. The YAA call premium equals the RP premium equal to $18.36 minus RP-HPE premium equal to $13.49 equals $4.87 divided by 82.5 bushels equals 5.9 cents. The YAA option premiums are calculated for the other coverage levels in Table 2. Notice at 80% coverage the YAA put premium is only 2.1 cents.

Low cost Price Insurance. The YAA put premium was 1.2 cents per bushel versus the current CME put that is selling for about 75 cents per bushel. Assuming 75% coverage, the example farmer in table 2 would have an at the money put when the farmer's actual yield equals the 75,000 bushel guarantee. If the harvest price declines by $1.00 this farmer's indemnity payment is $75,000, caused entirely by a price decline. This farmer paid $935 for a YAA put that paid $75,000. It will take more than 35 years for the insurance company to recover the loss from that YAA put.

Will these Price Triggers ever Occur? The fact is these RP price triggers have already been hit in the past on Revenue Assurance and Crop Revenue Coverage. In 2008 the corn price declined by a $1.27 from the $5.40 price election to $4.13 at harvest. A farmer with an 75,000 bushel guarantee and an actual corn yield of 75,000 bushels would have been paid a $95,250 indemnity payment caused by price loss only. In 2008 the soybean price declined by $4.14 from the $13.36 price election to $9.22 at harvest. A farmer with a 75,000 bushel guarantee and an actual soybean yield of 75,000 bushels would have been paid a $310,500 indemnity payment, and the entire loss was caused by price. If this

farmer's actual soybean yield was 100,000 bushels that was equal to her APH, then her indemnity payment was $80,000. In 2009 the KC wheat price declined by $2.42 from the $8.77 price election to $6.35 at harvest. A farmer with a 75,000 bushel guarantee and an actual wheat yield of 75,000 bushels would have been paid a $181,500 indemnity payment, and the entire loss was caused by price. If this farmer's actual wheat yield was 100,000 bushels that was equal to her APH, then her indemnity payment was $22,750.

If farmers on March 1 knew their actual yield would equal their APH yield, then the YAA put is similar to an out of the money put. If this farmer's yield were 100,000 bushels (APH yield) then price would need to decline to $4.47 to trigger payments with 75% coverage on corn (Table 2). The current CME $4.50 put premium is over 13 cents versus the 1.2 cents paid for the YAA put. At 85% coverage, price would need to decline to $5.07 to trigger payments with an actual yield equal to the APH yield. The current CME $5.10 put premium is over 30 cents versus 3.2 cents paid for the YAA put with 85% RP coverage. Farmers, who are concerned mostly about price risk, can justify the higher RP coverage levels when combined with the enterprise discount in most of the Corn Belt and with a good APH in many cases outside of the Corn Belt. Buying higher coverage using the enterprise unit discount will increase the "free" SURE coverage. In addition, an 80% enterprise unit will often cost less than the premium for 70% coverage with optional units and spot loss can be covered with private hail.

Protection from "Small" Price Changes. CME traded options do not protect farmers from "small" price changes. For example, if farmers buy an at the money $6.00 Dec corn put with a current market at $6.00 for a premium cost of 75 cents and hold it until harvest when they expect the market low; then the market price would need to fall from $6.00 to $5.25 before the CME put will provide a net payment. This is because at harvest the time value will be (near) zero and the net gain will only be the intrinsic value, if any, less the premium paid. If the market price is $5.25 on the put option expiration date (11/25/11 for Dec corn), then the option would expire with a value of 75 cents; which is the same premium as the farmer paid for the CME put, and the net gain is zero. Recognize this farmer could have sold the crop for $6 and maintain the hedge with RP, verses a current market price of $5.25 or a "paper loss" of 75 cents and the put option added nothing to the selling price.

Don't Forget the YAA Call. If farmers don't include the harvest price in their RP contract, then the YAA put can take on negative values. The YAA call eliminates the negative values in the YAA put and is an additional benefit that is not included in a CME call. The YAA call will increase the RP coverage if market prices increase. RP insured farmers will either produce the guaranteed bushels or have enough dollars to replace those guaranteed bushels at current market value. This allows farmers to forward price grain or replace livestock feed and remain in a fully hedged position.

Conclusion. The YAA put is very cheap downside price protection! The YAA corn puts are less than 3 cents in almost all cases, compared to CME puts with December premiums of about 75 cents. In many cases the YAA put is less than a penny. Farmers will also find the YAA puts for soybeans and spring wheat are also cheap when

compared with the premiums for market traded options. Farmers will also have their "option" order filled at the stated premium in the RP contract. Option markets are 'thin" and one does not always get their order filled at the posted premium. This is why when selling or buying options, one should only submit limit orders.

Because crop insurance uses futures for price discovery, makes it the most flexible USDA backed program for risk management. Other USDA programs tie price discovery to USDA-NASS prices that are not complete until a year after harvest and often don't track with current spot prices. In addition these programs also include payment limits and that limits their risk protection for commercial size agriculture. When commercial size agricultural producers have a big crop/revenue loss, the payment limit prevents the transfer of risk. Under crop insurance, farmers have flexibility in the level and type of coverage selected but farmers must pay a significant share of the crop insurance premium cost, verse transfer payments to farmers.

Changing from Revenue Protection to Yield Protection in nearly all cases means farmers are forgoing some very cheap price protection. Farmers with option trading experience will soon discover they can sell off part of the options built in to RP and reduce their insurance costs and still have more protection than provided by YP. However, selling options does reduce the net protection provided by RP, i.e. there is no "free lunch".

The crop insurance price discovery uses futures and is the necessary connection that allows farmers to fully hedge their crop sales and livestock feed requirements. In addition, this common price discovery will limit risk for farmers who want to take advantage of selling covered puts in addition to marketing their crops. Selling options as part of a risk management plan is a more advanced topic and only for farmers with experience in the futures market. The inclusion of put sales combined with marketing is a major topic in the RAM II workshops schedule for Wichita and Wyoming. The link to register is at: http://www.agmanager.info/events/RAM/2011/default.asp

Table 1. Comparison of Yield Adjusted Asian Options vs. CME Options

Parameter	YAA Option	CME Option
Strike Price	**1 Strike equal to price Election**	**Multiple Strike Prices**
Settlement Price	**RP Harvest Price, Monthly Average Price**	**Spot Price**
Yield	**Higher Yields reduce Price Loss payments**	**Yield Fixed (5,000 bu.)**
Exercise Rights	**None**	**Right to Exercise Option**
Time Value	**None**	**Time value declines to zero at expiration**
Minimum Put Premium	**YAA Put take on negative value when price increase**	**Zero**
Minimum Put Premium	**Zero and eliminates negative values in YAA Put**	**Zero**

Table 1. Cost for Yield Adjusted Asian Options for a Central Kansas Corn Farm

Non-Irrigated Corn		
Acres	909.1	
APH	110	
Price Election	$5.96	Price not final until March 1
Volatility	0.30	Volatility not final until March 1
Enterprise	Yes	
Location	Central Kansas	

Coverage %	**85%**	**80%**	**75%**	**70%**	**65%**	**60%**	**55%**	**50%**
$ Coverage	506,605	476,805	447,004	417,204	387,404	357,604	327,803	298,003
YP	33,073	18,886	11,332	7,990	6,472	5,350	4,646	3,989
RP-HPE	35,751	20,568	12,267	8,603	6,832	5,797	4,902	4,079
RP	47,376	27,500	16,690	12,012	9,837	8,451	7,206	6,031
Crop Insurance per Acre								
$ Coverage	$557.27	$524.49	$491.70	$458.92	$426.14	$393.36	$360.58	$327.80
YP	$36.38	$20.77	$12.47	$8.79	$7.12	$5.89	$5.11	$4.39
RP-HPE	$39.33	$22.62	$13.49	$9.46	$7.52	$6.38	$5.39	$4.49
RP	$52.11	$30.25	$18.36	$13.21	$10.82	$9.30	$7.93	$6.63
Crop Insurance Cents per Bushel								
Yield/bu.	38.9	23.6	15.1	11.4	10.0	8.9	8.4	8.0
YAA Put Cost/bu.	**3.2**	**2.1**	**1.2**	**0.9**	**0.6**	**0.7**	**0.5**	**0.2**
YAA Call Cost/bu.	**13.7**	**8.7**	**5.9**	**4.9**	**4.6**	**4.4**	**4.2**	**3.9**
Put Trigger Price if Actual Yield equals APH	$5.07	$4.77	$4.47	$4.17	$3.87	$3.58	$3.28	$2.98