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Agriculture Risk Coverage and Price Loss Coverage in the 2014 Farm Bill

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The 2014 Farm Bill's commodity title requires producers to make an important decision: whether to sign up for one of two versions of the Agriculture Risk Coverage (ARC) program or the Price Loss Coverage (PLC) program (see January 30, 2014, February 12, 2014, and February 6, 2014 for further information). This decision is made for each Farm Service Agency (FSA) farm. The choice of program is a one-time decision to be made by the deadline established by FSA and expected to be during the upcoming summer. The decision cannot be changed during the five-year life of the 2014 Farm Bill. Today's post describes each of the program options using an example farm to illustrate payment calculations across a range of price levels for corn and soybeans.

Price Loss Coverage

A farm will be covered under the Price Loss Coverage (PLC) program for the 2014 through 2018 crop years if all operators and landlords agree to elect PLC for any covered commodity. Additionally, PLC becomes the default program beginning with the 2015 crop year if they fail to come to a unanimous decision in choosing a program and the farm forfeits any potential 2014 payments. The design of PLC is similar to that of the Counter-Cyclical Payments program (CCP). Farms enrolled in PLC will receive payments if that commodity's marketing year average (MYA) price falls below the statutory reference price. For corn and soybeans, the 12-month marketing year begins in September of the year the crop is harvested (i.e., for the 2014 crop year this will be September 2014) and ends in August of the following year (i.e., August 2015). The reference prices are fixed by Congress throughout the life of the 2014 Farm Bill and are listed in Table 1. The reference price for corn is $3.70 per bushel. Soybean's reference price is $8.40 per bushel.

Table 2 provides an example that illustrates the PLC program under different 2014 MYA price levels. The example is based on a representative farm in McLean County, Illinois. Payment yields for the PLC program can be the existing CCP payment yields, or updated to 90 percent of the average yield for the commodity over the 2008 to 2012 crop years. The payment yields used in this example are set at 90 percent of the average yield in McLean county from 2008 to 2012 (146.6 bushels per acre for corn, and 48.9 bushels per acre for soybeans).

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Table 1. Comparison of CCP and PLC Price Support Levels

Covered Commodity	2008 Farm Bill CCP Target Price	2014 Farm Bill Reference Price
Wheat	$4.17/bu	$5.50/bu
Corn	$2.63/bu	$3.70/bu
Grain Sorghum	$2.63/bu	$3.95/bu
Barley	$2.63/bu	$4.95/bu
Oats	$1.79/bu	$2.40/bu
Long and medium grain rice	$10.50/cwt	$14.00/cwt
Temperate Japonica Rice[1]	N/A	$16.01/cwt
Soybeans	$6.00/bu	$8.40/bu
Other oilseeds	$12.68/cwt	$20.15/cwt
Peanuts	$495/ton	$535/ton
Dry peas	$8.32/cwt	$11.00/cwt
Lentils	$12.81/cwt	$19.97/cwt
Small chickpeas	$10.36/cwt	$19.04/cwt
Large chickpeas	$12.81/cwt	$21.54/cwt
Upland Cotton[2]	$0.7125/lb	N/A

[1]The Reference Price for Temperate Japonica Rice is set at 115 percent of the reference price for long and medium grain rice.

[2]Upland Cotton is no longer a covered commodity.

PLC payments are triggered on corn base acres if the MYA corn price falls below $3.70 and on soybean base if the MYA price for soybeans falls below $8.40. The payment rate equals the difference between the actual price (larger of the actual MYA price and the commodity's loan rate) and the reference price. The PLC payment rate is made on 85 percent of the base acres for the commodity; actual planted acres do not impact payment rates or eligibility.

Based on updated estimates announced today (Feb 20th) at the Agricultural Outlook Forum, the USDA's projected corn price for the 2014 marketing year is $3.90 and the projected soybean price is $9.65. Both price levels are above the reference prices of $3.70 and $8.40 for corn and soybeans. As shown in table 2, a lower MYA corn price of $3.50 would trigger a $0.20 per bushel PLC payment rate and result in a PLC payment of $24.93 per corn base acre for the example farm. A lower MYA soybean price of $8.25 would trigger a PLC payment rate of $0.15 per bushel and a $6.24 per soybean base acre payment.

Table 2. PLC Program Examples for Corn and Soybeans

Corn			Soybeans		
MYA Price	Payment Rate	PLC Payment ($/base acre)	MYA Price	Payment Rate	PLC Payment[1] ($/base acre)
$3.00	$0.70	$87.25	$8.25	$0.15	$6.24
$3.50	$0.20	$24.93	$9.00	$0.00	$0.00
$3.90	$0.00	$0.00	$9.65	$0.00	$0.00
$4.25	$0.00	$0.00	$10.50	$0.00	$0.00
$4.50	$0.00	$0.00	$11.25	$0.00	$0.00

[1]PLC Payments are made on 85 percent of base acres and based on payment yields of 146.6 and 48.9 bushels per acre for corn and soybeans, respectively.

County ARC

If producers and landowners unanimously elect ARC with county level coverage (County ARC) for a covered commodity, they will receive County ARC payments whenever the actual county revenue for the crop year is below the County ARC revenue guarantee. The actual county revenue is calculated by multiplying the average county yield for the commodity in the current crop year by the higher of the MYA for the commodity or the commodity's loan rate ($1.95 for corn, $5.00 for soybeans).

The revenue guarantee is calculated as follows. First, the county-level yield history for the commodity from the most recent 5 crop years is averaged, dropping each of the years with the highest and lowest county yields. This is known as the 5-year Olympic average. Additionally, if the crop's county yield during any of the 5 most recent crop years is less than 70 percent of the transitional yield for crop insurance (the T-yield), then the county yield for that crop year is replaced with 70 percent of the T-yield. This is known as a plug yield.

Second, the 5-year Olympic average of national MYA prices for the commodity is calculated. If any of those 5 crop years has a national average price that is below the PLC reference price for the commodity, that year's price is replaced by the reference price so that no price in the 5-year Olympic moving average can be below the reference price for the commodity. This provision also ensures that the price component of the County ARC guarantee will never be less than the commodity's reference price.

Third, the 5-year Olympic average of county yields is multiplied by the 5-year Olympic average of prices to determine the benchmark revenue. The County ARC revenue guarantee then equals 86 percent of that benchmark revenue. If actual revenue falls below the guarantee, County ARC triggers a payment rate equal to the difference or revenue shortfall. The payment rate is capped at 10 percent of the benchmark, setting coverage from 86 percent to 76 percent of the benchmark county revenue. County ARC payments are made on 85 percent of the commodity's base acres.

Table 3 illustrates County ARC benchmark and guarantee calculations for the 2014 crop year for a representative farm in McLean County, Illinois using the 2009 through 2013 yield and price histories for each crop. The 2013 county yields have not yet been released, however, so the 2013 corn and soybean yields reported for the Central crop reporting district are used. The MYA prices used for the 2013 marketing year were set equal to the midpoints of the February 2014 USDA WASDE report ($4.50 for corn, $12.70 for soybeans).

For this example, the corn yield used in the guarantee calculation would be 171.7 bushels per acre, taken as the average for the 2009, 2010, and 2011 crop years (the highest and lowest yields in 2012 and 2013 are dropped). The benchmark corn price is $5.30 per bushel, based on the average of the 2010, 2011, and 2013 ARC prices. Benchmark revenue for corn is $910 per acre ($5.30 x 171.7) and the revenue guarantee for corn is $783 (86% x $910). For soybeans, the benchmark yields and prices used in the calculation are 55 bushels per acre and $12.17 per bushel, resulting in a benchmark revenue of $669 per acre. The County ARC revenue guarantee for soybeans is then $575 per acre (86% x $669).

Table 3. An Example of 2014 County ARC Program Calculations for Corn and Soybeans in McLean County, IL

	Corn			Soybeans		
Year	Yield	MYA Price	ARC Price[1]	Yield	MYA Price	ARC Price[1]
2009	**186.0**	$3.55	$3.70	**54.0**	$9.59	$9.59
2010	**169.5**	$5.18	**$5.18**	58.5	$11.30	**$11.30**
2011	**159.6**	$6.22	**$6.22**	**56.0**	$12.50	**$12.50**
2012	109.5	$6.89	$6.89	52.3	$14.40	$14.40
2013	188.0	$4.50	**$4.50**	**55.0**	$12.70	**$12.70**
	Yield	Price	Revenue	Yield	Price	Revenue
Benchmarks[2]	171.7	$5.30	$910	55.0	$12.17	$669
Revenue Guarantee[3]			**$783**			**$575**

[1]The ARC Price is the larger of the actual MYA Price for the commodity or its PLC reference price.

[2]Yield and price benchmarks are the 5-year Olympic averages of county yields and ARC prices, respectively. The revenue benchmark is the product of the yield and price benchmarks.

[3]Revenue guarantee is 86 percent of the revenue benchmark.

Table 4 reports County ARC payments at different 2014 MYA price levels. The example assumes trend yield levels for McLean county corn and soybeans in 2014 of 180 and 56 bushels per acre, respectively. For corn, County ARC payments would be triggered if the 2014 MYA price falls below $4.35 per bushel. If the MYA price is $4.25 per bushel, actual revenue would be $765 ($4.25 x 180) and the ARC payment rate would be $18 per acre ($783-$765). The County ARC payment would be $15 per corn base acre (0.85 x $18). At the 2014 projected price of $3.90, the County ARC payment would be $69 per corn base acre. The maximum ARC payment rate of $91 per corn base acre would be met if prices fall below $3.85.

Table 4. County ARC Payments for Corn and Soybeans at Different 2014 MYA Price Levels, McLean County, IL

Corn				Soybeans			
2014 MYA Price	ARC Actual Revenue[1]	ARC Payment Rate[2]	ARC Payment[3] ($/base acre)	2014 MYA Price	ARC Actual Revenue[1]	ARC Payment Rate[2]	ARC Payment[3] ($/base acre)
$3.00	$540	$91	$77	$8.25	$462	$67	$57
$3.50	$630	$91	$77	$9.00	$504	$67	$57
$3.90	$702	$81	$69	$9.65	$540	$35	$30
$4.25	$765	$18	$15	$10.50	$588	$0	$0
$4.50	$810	$0	$0	$11.25	$630	$0	$0

[1]ARC Revenue is the product of the actual MYA Price and actual county yield. The example uses trend yields of 180 and 56 bushels per acre for corn and soybeans, respectively.

[2]The ARC Payment Rate is the difference between ARC Revenue and the Revenue Guarantee ($783 for corn, $575 for soybeans in the example)

[3]The ARC Payment is equal to 0.85 times the ARC Payment Rate

In this example, County ARC payments for soybeans in McLean county would be triggered in 2014 if the soybean price falls below $10.27 and the maximum County ARC payment for soybeans would be met if 2014 prices fell below $9.08. At a price of $9.65, the County ARC payment on soybean base acres would be $30 per soybean base acre. The maximum County ARC payment for 2014 would be approximately $57 per soybean base acre.

Individual ARC

If the producers and landowners of a farm elect ARC with individual farm level coverage (Individual ARC), that election applies to all covered commodities on the farm. Individual ARC cannot be elected on a

commodity-by-commodity basis; all of a farm's commodities must be enrolled in the program if it is elected. The calculations for Individual ARC must also take into consideration each producer's planted acreage share in all farms in the same state in which the producer has an interest and for which Individual ARC has been selected. Similar to County ARC, payments are triggered whenever the actual revenue falls below the revenue guarantee. Payments for Individual ARC, however, are made on 65 percent of the farm's total base acres for all covered commodities planted on the farm.

The actual revenue for Individual ARC is calculated as a weighted average of the actual revenues for each covered commodity. The weights used in computing the average reflect the amount of acreage planted to each crop in the given crop year. Actual revenue for each individual commodity equals the yield for that commodity multiplied by the price (higher of the MYA price and the commodity's loan rate). For the benchmark revenue, the revenue for each commodity for the 5 most recent crop years is calculated by multiplying the yield and national average price for each year. As with County ARC, low yields in individual years are replaced by 70 percent of the T-yield and the reference price will replace any actual prices falling below that level. Once the revenue for each year is calculated, the 5-year Olympic average of that commodity's revenues is calculated. The Individual ARC Benchmark Revenue then uses the crop-specific Olympic averages to compute a weighted average whole-farm revenue, where the weights are based on planted acreage for each commodity. The Individual ARC Revenue Guarantee is set at 86 percent of that benchmark revenue. Again, the payment rate is the difference between the revenue guarantee and the actual revenue, but capped at 10 percent of the benchmark revenue resulting in coverage between 86 percent and 76 percent of the benchmark.

Table 5 illustrates the Individual ARC revenue guarantee calculations using the McLean county yield history from the previous example as the farm-level corn and soybean yields. For this example, it was assumed that 60% of the farm's acreage is planted to corn in 2014 and 40% is planted to soybeans and those are the weights used to calculate the whole-farm Individual ARC Benchmark Revenue (the final column in table 5).

The benchmark revenue for corn in this example is $826 per acre, based on the corn revenues for the 2010, 2012, and 2013 crop years. The benchmark revenue for soybeans is $687 per acre. Using the planted acreage weights, the Individual ARC Revenue Benchmark is $770 per acre (0.60 x $826 + 0.40 x $687). The Individual ARC revenue guarantee is then $663 per acre (0.86 x $770).

Table 5. An Example of 2014 Individual ARC Program Calculations for Corn and Soybeans in McLean County, IL

Year	Corn Yield[1]	Corn ARC Price[2]	Corn ARC Revenue[3]	Soybean Yield[1]	Soybean ARC Price[2]	Soybean ARC Revenue[3]	Individual ARC Revenue[4]
2009	186.0	$3.70	$688	54.0	$9.59	$518	
2010	169.5	$5.18	**$878**	58.5	$11.30	**$661**	
2011	159.6	$6.22	$993	56.0	$12.50	**$700**	
2012	109.5	$6.89	**$755**	52.3	$14.40	$753	
2013	188.0	$4.50	**$846**	55.0	$12.70	**$699**	
Benchmark Revenue[5]			$826			$687	$770
Revenue Guarantee[6]							**$663**

[1]Individual ARC uses actual farm-level yields. For the example, McLean county yields are used.

[2]ARC Prices are the larger of the actual MYA price and the commodity's reference price.

[3]Crop-specific ARC revenues are the product of farm-level yields and ARC prices.

[4]Individual ARC Benchmark Revenue is the weight average of the crop-specific revenues, where the weights are based on planted acreage.

[5]Benchmark Revenues for each crop are the 5-year Olympic average the revenue histories.

[6]Individual ARC Revenue Guarantee is 86 percent of the benchmark revenue.

Table 6 reports Individual ARC revenue payments across a range of price levels for corn and soybeans for the 2014 marketing year. Actual Individual ARC revenue must fall below the guarantee of $663 to trigger a

payment. For example, assuming trend yields (180 and 56 bushels per acre for corn and soybeans), a $3.90 corn price and a $9.65 soybean price results in an actual revenue of $637 per acre (0.6 x $702 + 0.4 x $540 = $637) and an Individual ARC payment of $16 per base acre (0.65 x ($663 - $637) = $16). For the lower price scenarios provided in table 6 the maximum Individual ARC payment rate of $77 is met (0.10 x $770), resulting in a maximum Individual ARC payment of $50 per base acre.

Table 6. Individual ARC Payments for Corn and Soybeans at Different 2014 MYA Price Levels, McLean County, IL

2014 Corn Price	Corn Revenue[1]	2014 Soybean Price	Soybean Revenue[1]	Individual ARC Actual Revenue[2]	Individual ARC Payment Rate[3]	Individual ARC Payment[4] ($/base acre)
$3.00	$540	$8.25	$462	$509	$77	$50
$3.50	$630	$9.00	$504	$580	$77	$50
$3.90	$702	$9.65	$540	$637	$25	$16
$4.25	$765	$10.50	$588	$694	$0	$0
$4.50	$810	$11.25	$630	$738	$0	$0

[1]Crop-specific revenue is the product of the actual MYA price and farm-level yield. For the example, trend yields of 180 and 56 bushels per acre were used.

[2]Individual ARC Revenue is the weighted average of the crop-specific revenues, where the weights are based on planted acreage.

[3]The Individual ARC Payment Rate is the difference between actual revenue and the guarantee ($663 in this example).

[4]The Individual ARC Payment per base acre is 0.65 times the payment rate.

Summary and Considerations for Product Choice

The 2014 Farm Bill gives farm operators and landowners the choice among fixed price supports (PLC) and county- or farm-level revenue coverage (ARC). Calculators will soon be released by the *farmdoc* team to aid in comparison across programs. Without calculators, some general conclusions about the programs can be reached.

Assuming trend yield levels in 2014 for corn and soybeans, County ARC payments in 2014 would reach their limits in most Midwest counties at price levels that are above the PLC reference price levels but below the USDA's projections for the 2014 marketing year. In comparing the Individual and County ARC options, Individual ARC seems likely to trigger smaller payments than County ARC under most circumstances. This is because Individual ARC pays on 65 percent of base acres compared to 85 percent for County ARC. Also, by averaging revenues across crops, Individual ARC will tend to reduce the likelihood and size of payments due to diversification effects. Individual ARC also has higher reporting requirements than the other choices. However, Individual ARC does provide revenue protection based on actual farm-level yields which could make it more desirable in areas where there is significant yield basis risk (i.e. the potential for significant difference between county and farm yields).

Second, the choice between ARC and PLC will be fundamentally related to price expectations relative to the reference price. Take corn as an example with a $3.70 reference price. If MYA prices are expected to be above $3.70 over the next five years, ARC will provide better protection since PLC will never trigger payments. If prices are expected to be very low, averaging less than $3.00, PLC will arguably provide better support due to the adjustment in the ARC revenue guarantee to lower prices and the 10 percent cap on ARC payments. Price expectations in the $3.00 to $3.70 range make the comparison and decision more difficult. ARC will potentially make larger payments than PLC towards the higher end of that price range, particularly during early years of the Farm Bill. However, PLC could make larger payments at the lower end of the range, particularly in later years.

For corn and soybeans, price expectations offered by contracts on futures markets suggest that County ARC will make larger payments. This expectation of higher payments should be weighed against the higher payments offered by PLC at low, but unlikely, prices.

Finally, the choice of either ARC option will make the producer ineligible to purchase the supplemental coverage option (SCO) crop insurance program on that farm, which will be made available beginning in the 2015 crop year. Related to this, in addition to price expectations, producers should also consider how the base acreage on their farms compares to what they expect to plant over the next five crop years. The PLC and ARC commodity programs tie payments to base acreage while the SCO program covers planted acreage. Next week's Farm Bill post will describe this new SCO program and consider how it interacts with these commodity program choices.

For more information and further discussion on the PLC and ARC programs, we encourage readers to consider registering for the March 5th *farmdoc daily* webinar with Jonathan Coppess.

References

Zulauf, C. "2014 Crop Safety Net Decision: Key Considerations." *farmdoc daily* (4):25, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 12, 2014.

Coppess, J. "Evaluating Commodity Program Choices in the New Farm Bill." *farmdoc daily* (4):21, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 6, 2014.

Zulauf, C. "2014 Farm Bill Farm Safety Net: Summary and Brief Thoughts." *farmdoc daily* (4):16, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, January 30, 2014.