ARC or PLC: an example for wheat

April 2014

Grain Marketing Report #01-14

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The Agricultural Act of 2014, the new Farm Bill, eliminates the familiar commodity support programs of the 2008 bill: direct payments, counter-cyclical payments, and ACRE. In their place, producers must choose between two new commodity programs, Price Loss Coverage (PLC) or Agricultural Risk Coverage (ARC). Presented here is a comparison of the benefits each program provides for wheat.

PLC is similar to the counter-cyclical payment program that pays on base acres if the national marketing year average price falls below the target price. In the language of the new farm bill, the old target price is called the reference price. The reference price for wheat in the 2014 farm bill is $5.50 per bushel.

ARC is more similar to the ACRE program. It pays on base acres if actual revenue falls below a guaranteed level of revenue. This benchmark is based on a five-year Olympic average (high and low values excluded) of county yields and national marketing year average prices.

During farm bill debate, ARC was referred to as a program protecting against shallow losses and PLC a program to protect against deep losses (Outlaw, 2014). The first payments for either program will not be made until after September 2015 for the 2014 crop.

Another factor which will impact the PLC versus ARC decision is that only PLC participants will be able to add the Supplemental Coverage Option (SCO) to their crop insurance coverage. SCO is a new crop insurance product that provides county level coverage for insured losses (yield or revenue depending on the underlying insurance product purchased) from 86% down to the coverage level of the underlying policy.

Many programs have been offered and materials produced to assist farmers in understanding the differences between PLC and ARC programs (Barnaby, 2014; Schnitkey, Coppess, Paulson, and Zulauf 2014; Outlaw 2014). As USDA and the Farm Service Agency finalize program rules, the Agricultural and Food Policy Center, Texas A&M University and others will offer various forms of online decisions aids.

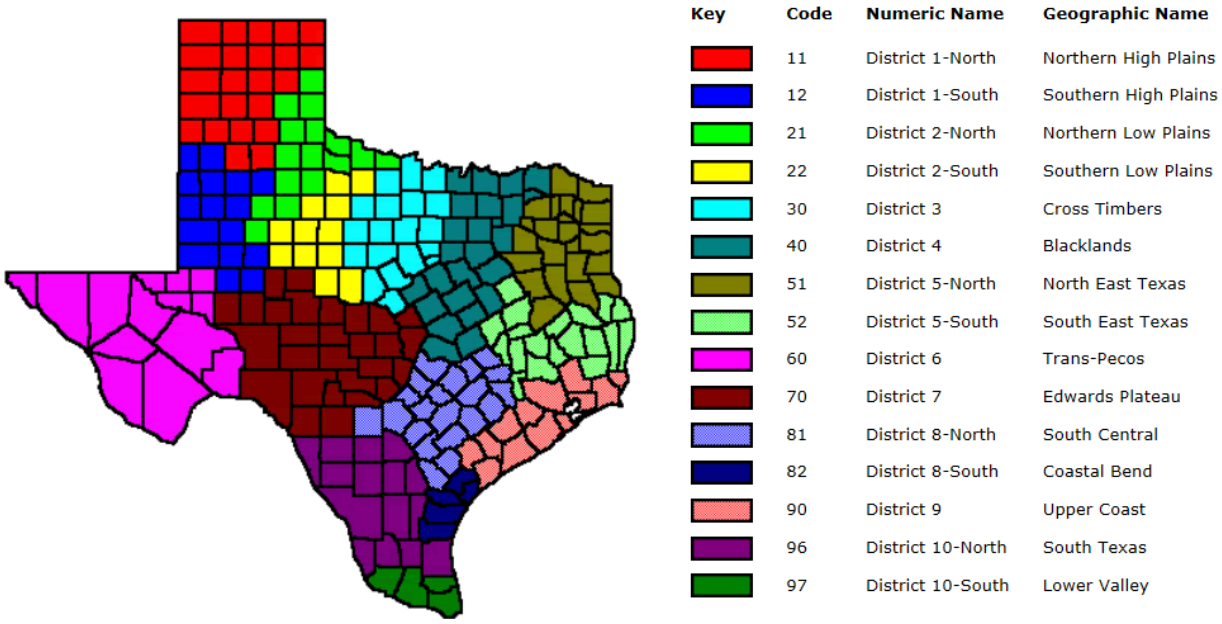
To help farmers prepare for the decisions they face in making a choice between PLC and ARC, shown here is a comparison of how the programs will work under a hypothetical set of price and yield conditions. The price and yield components of this example are not intended as forecasts or expectations. The numbers used here demonstrate the mechanics of ARC and PLC to produce one set of outcomes. While this example is for a specific area of Texas, it can be easily adapted to other production regions. Working through this example demonstrates the components of each program that affect the payment outcomes, particularly the relative sensitivity of each program to price and yield variability. A producer's expectations of both will be important factors in deciding into which program to enroll.

This example is for a dryland Texas wheat producer in the Southern Low Plains, Texas Agricultural Statistics District 2-South (Figure 1). From 2009 to 2013 this area has seen a wide variation in yield, from 15.3 to 30.3 bushels per acre (Table 1). The national marketing year average price for wheat (MYA—June 1 through May 31) from USDA over that same period of time has ranged from $4.87 to $7.77 per

bushel. In ARC, if the national average marketing year price falls below the reference price, it is replaced by the reference price. Therefore, the lowest national average farm price in any one year that can be used for payment calculations in ARC is $5.50 for wheat. The county t-yield in this example is 20 bushels per acre. Under ARC, if the county yield in any given year falls below 70% of the t-yield, it can be replaced with that 70% of t-yield number. In this example the minimum yield is 14 bushels per acre.

The price projections of this example come from two sources: Art Barnaby of Kansas State University for 2013/2014 and 2014/2015 and the Food and Agricultural Policy Research Institute for prices from 2015/2016 to 2018/2019. Yield expectations are the author's, based on poor wheat production prospects at present (USDA, NASSb, 2014), the likelihood of much better yields in an El Nino winter (currently forecast for 2014/2015, National Weather Service, 2014), and then a return to more normal yields (Table 1 and Figure 2).

Figure 1. Texas Agricultural Statistics Districts



Source: USDA, NASSa

Table 1. Historical and Projected Prices and Yields

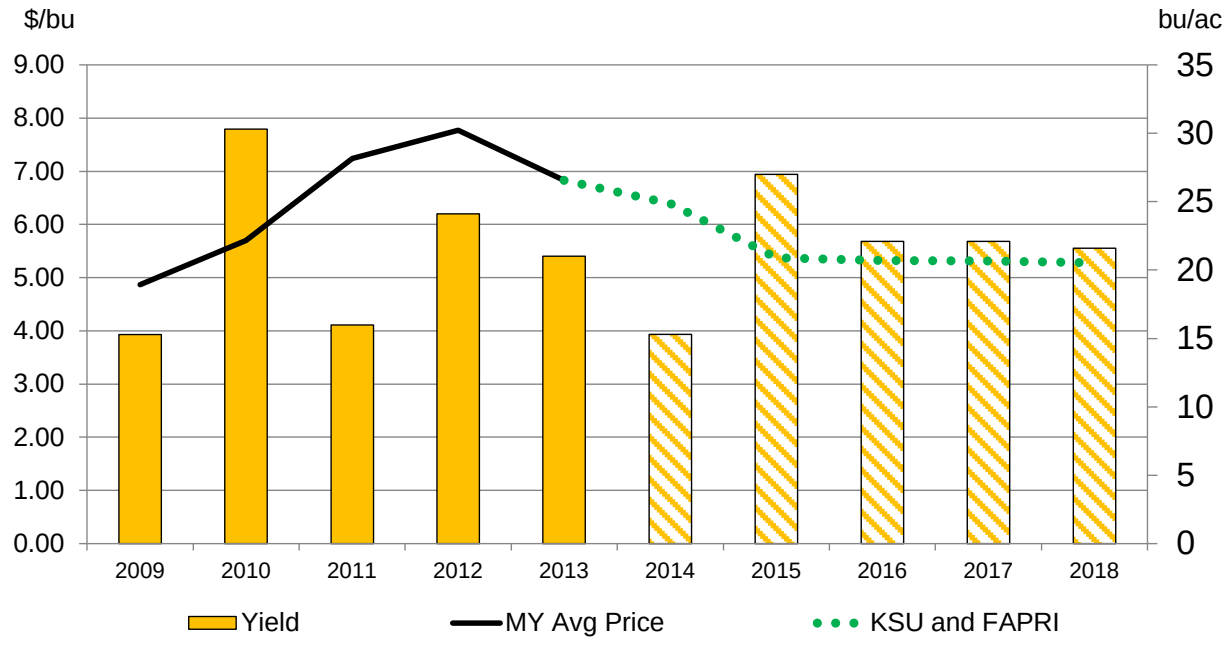
	MYA price	Reference Price Wheat	County Average Yield	County t-yield	70% of county t-yield
2009/2010	4.87		15.3	20.0	14.0
2010/2011	5.70		30.3	20.0	14.0
2011/2012	7.24		16.0	20.0	14.0
2012/2013	7.77		24.1	20.0	14.0
2013/2014	6.83[1]		21.0	20.0	14.0
2014/2015	6.39[1]	5.50	15.3[3]	20.0	14.0
2015/2016	5.37[2]	5.50	27.0[3]	20.0	14.0
2016/2017	5.32[2]	5.50	22.1[3]	20.0	14.0
2017/2018	5.31[2]	5.50	22.1[3]	20.0	14.0
2018/2019	5.28[2]	5.50	21.6[3]	20.0	14.0

[1] Art Barnaby, Kansas State University, March 11, 2014

[2] Food and Agricultural Policy Research Institute, 2014 U.S. Baseline Briefing Book, March 14, 2014

[3] Projections of the author

Figure 2. Marketing Year Average Wheat Prices and Yields



PLC

PLC pays when the national marketing year average price falls below the reference price. In this example, the projected price for 2014/2015 is $6.39, well above the $5.50 reference price. No PLC payment would be made in 2014/2015. However, the price path projected here is for prices to continue to trend lower, falling below the reference price in 2015/2016 through 2018/2019 (Table 2). In these years PLC would generate base acre payments calculated as:

PLC $ per base acre = (reference price minus MYA price) * (farm payment yield) * PLC payment fraction.

In any year the MYA price stays above the reference price, no PLC payment would be made. A greater decline in prices would result in larger PLC payments. If actual prices are below the reference price but higher than those of this example, PLC payments would be less; lower prices than those of this example would generate higher PLC payments. Actual yields do not affect payment levels.

Table 2. PLC Payments per Base Acre

	MYA price	Reference price	Difference	Payment Yield	PLC payment fraction	PLC Payment $/base acre
2014	6.39	5.50	-0.89	19.5	0.85	0.00
2015	5.37	5.50	0.13	19.5	0.85	2.15
2016	5.32	5.50	0.18	19.5	0.85	2.98
2017	5.31	5.50	0.19	19.5	0.85	3.15
2018	5.28	5.50	0.22	19.5	0.85	3.65

ARC

ARC generates payments when actual county revenue is below the county revenue guarantee. First, benchmark revenue for the county is calculated:

Benchmark revenue = 5-year Olympic average of county yields * 5-year Olympic average of prices.

The ARC revenue guarantee is then benchmark revenue * 0.86.

Actual county revenue is calculated as the realized county yield times that year's MYA price.

ARC pays when the ARC revenue guarantee is greater than actual county revenue, subject to a payment fraction of 85% and a payment cap of 10% of benchmark revenue in any given year.

ARC $ per base acre = (ARC guarantee revenue – actual revenue) * ARC payment fraction.

For 2014 (Table 3), this example shows benchmark revenue of $134.44 (20.4 Olympic average yield*$6.59 Olympic average MYA price) and an ARC revenue guarantee of $115.61 ($134.44*0.86). The maximum ARC payment is limited to 10% of benchmark revenue, $13.44 per base acre. Actual county revenue in this case is $97.77 (15.3 bushels*$6.39). The actual difference between the ARC revenue guarantee and actual revenue is $17.84 ($115.61-$97.77). Therefore ARC will pay based on the payment

cap of $13.44. The payment for 2014 is the maximum possible under this program for this year, $11.42 per base acre ($13.44*0.85).

Table 3. 2014 ARC Payments per Base Acre

Crop Year	Yield	MYA price	Adj. MYA price	Benchmark revenue	ARC revenue	10% payment cap	ARC payment fraction	Base acre payment cap
2009	15.3	4.87	5.50					
2010	30.3	5.70	**5.70**					
2011	**16.0**	7.24	**7.24**					
2012	**24.1**	7.77	7.77					
2013	**21.0**	6.83	**6.83**					
2014	15.3	6.39		134.44	115.61	13.44	0.85	11.42
2015								
2016								
2017								
2018								
Olympic Average	20.4		6.59					

	Calculated revenue	ARC Benchmark Revenue	Revenue shortfall	ARC payment $/base acre
2014	97.77	115.61	17.84	11.42
2015				
2016				
2017				
2018				

While ARC protection can fall, it has two components which serve to limit how far the county revenue calculation can decline. First, anytime the MYA price is below the reference price, the reference price is plugged in to calculate the Olympic average of prices. Second, anytime the actual county yield is less than 70% of the county's t-yield, the 70% of t-yield number is used to calculate the Olympic average of yield.

For 2015 (Table 4), with an Olympic average yield of 20.4 bushels and an Olympic average of the MYA price of $6.82, benchmark revenue is $139.13. ARC benchmark revenue is $119.65 ($139.13*0.86). The ARC payment cap is $13.91 ($139.13*0.10) for an effective base acre payment cap of $11.82 ($13.91*0.85).

Even though the MYA wheat price in 2015 was a dollar per bushel lower than 2014, yields were well above average, 27.0 bushels per acre. Actual county revenue of $144.99 (27.0*$5.37) is above ARC benchmark revenue so there is no revenue shortfall and no ARC payments were made.

This example continues for years 2016 through 2018, showing the level of ARC payments generated as prices continue to trend downward and yields return to normal (Tables 5 through 7).

Table 4. 2015 ARC Payments per Base Acre

Crop Year	Yield	MYA price	Adj. MYA price	Benchmark revenue	ARC benchmark revenue	10% payment cap	ARC payment fraction	Base acre payment cap
2009	15.3	4.87	5.50					
2010	30.3	5.70	5.70					
2011	**16.0**	7.24	**7.24**					
2012	**24.1**	7.77	7.77					
2013	**21.0**	6.83	**6.83**					
2014	15.3	6.39	**6.39**	134.44	115.61	13.44	0.85	11.42
2015	27.0	5.37		139.13	119.65	13.91	0.85	11.82
2016								
2017								
2018								
Olympic Average	20.4		6.82					

	Calculated revenue	ARC Benchmark Revenue	Revenue shortfall	ARC payment $/base acre
2014	97.77	115.61	17.84	11.42
2015	144.99	119.65	0.00	0.00
2016				
2017				
2018				

Table 5. 2016 ARC Payments per Base Acre

Crop Year	Yield	MYA price	Adj. MYA price	Benchmark revenue	ARC benchmark revenue	10% payment cap	ARC payment fraction	Base acre payment cap
2009	15.3	4.87	5.50					
2010	30.3	5.70	5.70					
2011	**16.0**	7.24	**7.24**					
2012	**24.1**	7.77	7.77					
2013	**21.0**	6.83	**6.83**					
2014	15.3	6.39	**6.39**	134.44	115.61	13.44	0.85	11.42
2015	27.0	5.37	5.50	139.13	119.65	13.91	0.85	11.82
2016	22.1	5.32		139.13	119.65	13.91	0.85	11.82
2017								
2018								
Olympic Average	20.4		6.82					

	Calculated revenue	ARC Benchmark Revenue	Revenue shortfall	ARC payment $/base acre
2014	97.77	115.61	17.84	11.42
2015	144.99	119.65	0.00	0.00
2016	117.57	119.65	2.08	1.77
2017				
2018				

Table 6. 2017 ARC Payments per Base Acre

Crop Year	Yield	MYA price	Adj. MYA price	Benchmark revenue	ARC benchmark revenue	10% payment cap	ARC payment fraction	Base acre payment cap
2009	15.3	4.87	5.50					
2010	30.3	5.70	5.70					
2011	16.0	7.24	7.24					
2012	**24.1**	7.77	7.77					
2013	**21.0**	6.83	**6.83**					
2014	15.3	6.39	**6.39**	134.44	115.61	13.44	0.85	11.42
2015	27.0	5.37	**5.50**	139.13	119.65	13.91	0.85	11.82
2016	**22.1**	5.32	5.50	139.13	119.65	13.91	0.85	11.82
2017	22.1	5.31		139.78	120.21	13.98	0.85	11.88
2018								
Olympic Average	22.4		6.24					

	Calculated revenue	ARC Benchmark Revenue	Revenue shortfall	ARC payment $/base acre
2014	97.77	115.61	17.84	11.42
2015	144.99	119.65	0.00	0.00
2016	117.57	119.65	2.08	1.77
2017	117.35	120.21	2.86	2.43
2018				

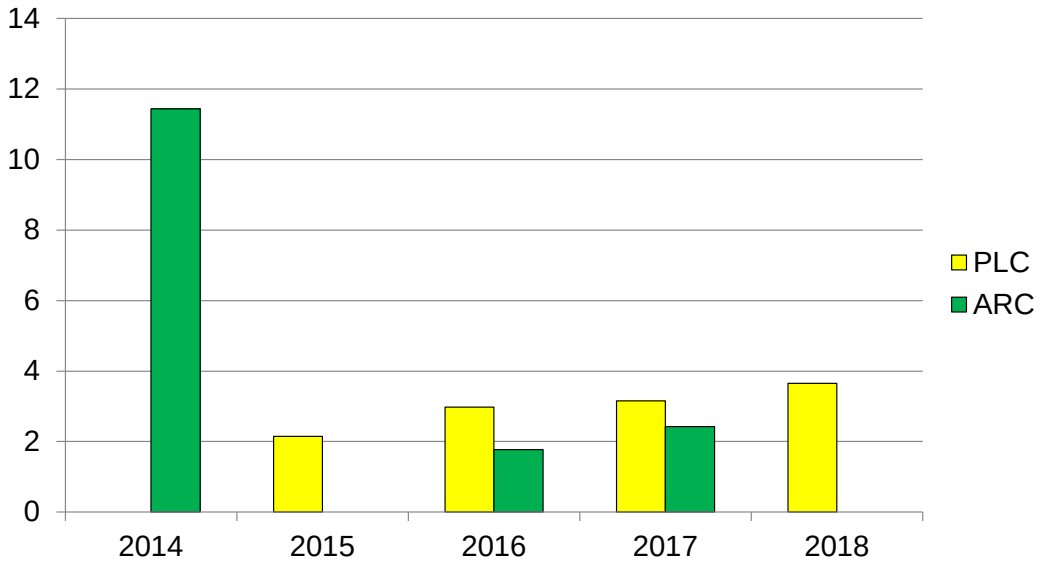
Table 7. 2018 ARC Payments per Base Acre

Crop Year	Yield	MYA price	Adj. MYA price	Benchmark revenue	ARC benchmark revenue	10% payment cap	ARC payment fraction	Base acre payment cap
2009	15.3	4.87	5.50					
2010	30.3	5.70	5.70					
2011	16.0	7.24	7.24					
2012	24.1	7.77	7.77					
2013	**21.0**	6.83	6.83					
2014	15.3	6.39	**6.39**	134.44	115.61	13.44	0.85	11.42
2015	27.0	5.37	**5.50**	139.13	119.65	13.91	0.85	11.82
2016	**22.1**	5.32	**5.50**	139.13	119.65	13.91	0.85	11.82
2017	**22.1**	5.31	5.50	139.78	120.21	13.98	0.85	11.88
2018	21.6	5.28		125.86	108.24	12.59	0.85	10.70
Olympic Average	21.7		5.80					

	Calculated revenue	ARC Benchmark Revenue	Revenue shortfall	ARC payment $/base acre
2014	97.77	115.61	17.84	11.42
2015	144.99	119.65	0.00	0.00
2016	117.57	119.65	2.08	1.77
2017	117.35	120.21	2.86	2.43
2018	114.05	108.24	0.00	0.00

For the five years represented here, PLC would generate a total of $11.93 per base acre; ARC pays a total of $15.62 per base acre (Figure 3). These payment projections would change under different scenarios for yields and prices—both could be zero or one could be significantly higher than the other. A producer's expectations in regards to both yield and price will be important considerations as to which program to choose, as would the relative importance of the Supplemental Coverage Option, available only under PLC.

Figure 3. PLC and ARC Payment Projections



Not covered here is the option to select ARC Individual. ARC Individual is more of a whole farm revenue insurance program in that it uses actual and benchmark revenue calculations weighted by a farm's revenue, not individual crops. Another important difference is that ARC Individual pays on 65% of base acres rather than 85%.

Producers will also have the opportunity to update base acres for crops planted anytime from 2009 to 2012. If they choose, they may also update payment yields to 90% of the 2008 to 2012 crop year averages. This has particular significance for PLC since payment yields directly affect calculated payments.

The sign-up for the 2014 farm program will likely be sometime in late 2014 or early 2015 (Vilsack, 2014). The advantage of a late sign-up period for wheat producers is that the yields and MYA price for 2013/2014 will be known and much of the 2014/2015 MYA price will be established (USDA, ERS, 2014). This degree of certainty over short term benefits of each program will need to be weighed against longer term expectations regarding yields and price.

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