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Potential ARC-CO and PLC Payment Calculations Using FAPRI's Baseline MYA Price Estimates

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Given the somewhat complex nature of the new ARC-CO commodity support program, producers now must consider marketing year average (MYA) prices over the next five years in order to evaluate any potential ARC-CO (and PLC) farm program payment made to eligible covered commodities produced on their farming operation. The Food and Agricultural Policy Research Institute (FAPRI) of the University of Missouri publishes this type of data via a monthly report entitled: *U.S. Crop Price Update* that forecasts MYA price estimates through the 2018 crop year. Table 1 lists the estimated MYA prices for corn, soybeans, wheat, grain sorghum, long grain rice, and medium grain rice from their September, October, and the November price reports. A basic statistical price description is presented for each of the aforementioned commodities for the previous three months.

A key design difference between the ARC-CO and PLC programs is that the ARC-CO is an area-wide "shallow loss" revenue program while the PLC operates similar to a target price program. Election of ARC-CO and PLC is on a covered commodity-by-covered commodity, farm-by-farm basis. The MYA price for each covered commodity is used in both ARC-CO and the PLC payment calculations. However, there are distinctions between how this price measure is applied to the operational mechanics of each program. The MYA price is a function of the most recent five-year Olympic average in calculating the ARC-CO benchmark and guarantee revenue thresholds. For purposes of the PLC program, calculations are made in a straightforward way. If the MYA price is below the congressionally-established reference price, then a PLC payment is made in the amount that the reference price exceeds the MYA price. Reference prices are presented in Table 2.

In the examples that follow, ARC-CO and PLC farm program payments are calculated using a parish-level yield assumption for the next five years coupled with the monthly FAPRI MYA price projections through 2018. Historical yields per crop per locale were obtained from the USDA FSA farm bill website. A long grain rice and soybean farm located in the southwestern region of Louisiana (Acadia parish) is modeled. Mixed-grain farms consisting of corn, soybeans, grain sorghum, and wheat from the central and northeastern regions (Avoyelles and East Carroll parishes) are also modeled. Finally, a northwest region (Caddo parish) corn and soybean farm is modeled. Table 3 lists the yield assumptions used for each parish per covered commodity used in this program analysis.

Table 1. Series of FAPRI baseline MYA price estimates through the 2018 crop year.

Covered Commodity	FAPRI MYA Price Baseline	2013/14 (F)	2014/15*	2015/16*	2016/17*	2017/18*	2018/19*
Corn	September	$4.45	$3.50	$3.80	$3.97	$4.12	$4.22
	October	$4.46	$3.40	$3.74	$3.98	$4.19	$4.20
	November	$4.46	$3.50	$3.89	$4.02	$4.10	$4.10
	MIN		*$3.40*	*$3.74*	*$3.97*	*$4.10*	*$4.10*
	MAX		*$3.50*	*$3.89*	*$4.02*	*$4.19*	*$4.22*
	AVG		*$3.467*	*$3.810*	*$3.990*	*$4.137*	*$4.173*
	STD DEV		*$0.058*	*$0.075*	*$0.026*	*$0.047*	*$0.064*
	CV		*1.67%*	*1.98%*	*0.66%*	*1.14%*	*1.54%*
Soybeans	September	$13.00	$9.92	$9.04	$9.72	$10.32	$10.57
	October	$13.00	$9.95	$8.93	$9.55	$10.26	$10.50
	November	$13.00	$10.00	$9.10	$9.78	$10.08	$10.23
	MIN		*$9.92*	*$8.93*	*$9.55*	*$10.08*	*$10.23*
	MAX		*$10.00*	*$9.10*	*$9.78*	*$10.32*	*$10.57*
	AVG		*$9.957*	*$9.023*	*$9.683*	*$10.220*	*$10.433*
	STD DEV		*$0.040*	*$0.086*	*$0.119*	*$0.125*	*$0.180*
	CV		*0.41%*	*0.96%*	*1.23%*	*1.22%*	*1.72%*
Wheat	September	$6.89	$5.88	$5.31	$5.50	$5.69	$5.81
	October	$6.89	$5.80	$5.28	$5.51	$5.73	$5.84
	November	$6.89	$5.88	$5.26	$5.40	$5.59	$5.78
	MIN		*$5.80*	*$5.26*	*$5.40*	*$5.59*	*$5.78*
	MAX		*$5.88*	*$5.31*	*$5.51*	*$5.73*	*$5.84*
	AVG		*$5.853*	*$5.283*	*$5.470*	*$5.670*	*$5.810*
	STD DEV		*$0.046*	*$0.025*	*$0.061*	*$0.072*	*$0.030*
	CV		*0.79%*	*0.48%*	*1.11%*	*1.27%*	*0.52%*
Grain Sorghum	September	$4.25	$3.33	$3.64	$3.75	$3.88	$3.96
	October	$4.28	$3.33	$3.54	$3.71	$3.88	$3.92
	November	$4.28	$3.41	$3.60	$3.75	$3.87	$3.91
	MIN		*$3.33*	*$3.54*	*$3.71*	*$3.87*	*$3.91*
	MAX		*$3.41*	*$3.64*	*$3.75*	*$3.88*	*$3.96*
	AVG		*$3.357*	*$3.593*	*$3.737*	*$3.877*	*$3.930*
	STD DEV		*$0.046*	*$0.050*	*$0.023*	*$0.006*	*$0.026*
	CV		*1.38%*	*1.40%*	*0.62%*	*0.15%*	*0.67%*
Rice (LG)	September	$15.40	$13.01	$12.33	$12.10	$12.13	$12.27
	October	$15.40	$12.97	$12.48	$12.35	$12.43	$12.56
	November	$15.40	$12.57	$12.82	$13.09	$13.09	$13.13
	MIN		*$12.57*	*$12.33*	*$12.10*	*$12.13*	*$12.27*
	MAX		*$13.01*	*$12.82*	*$13.09*	*$13.09*	*$13.13*
	AVG		*$12.850*	*$12.543*	*$12.513*	*$12.550*	*$12.653*
	STD DEV		*$0.243*	*$0.251*	*$0.515*	*$0.491*	*$0.438*
	CV		*1.89%*	*2.00%*	*4.11%*	*3.91%*	*3.46%*
Rice (MG)	September	$16.10	$14.34	$13.67	$13.44	$13.51	$13.70
	October	$16.10	$14.72	$13.83	$13.73	$13.84	$14.02
	November	$15.80	$15.49	$14.21	$14.55	$14.57	$14.65
	MIN		*$14.34*	*$13.67*	*$13.44*	*$13.51*	*$13.70*
	MAX		*$15.49*	*$14.21*	*$14.55*	*$14.57*	*$14.65*
	AVG		*$14.850*	*$13.903*	*$13.907*	*$13.973*	*$14.123*
	STD DEV		*$0.586*	*$0.277*	*$0.576*	*$0.542*	*$0.483*
	CV		*3.95%*	*1.99%*	*4.14%*	*3.88%*	*3.42%*

Table 2. Congressionally-set reference prices for covered commodities in the 2014 farm bill.

Commodity	Reference Price (per unit)
Corn	$3.70/bu
Soybeans	$8.40/bu
Grain Sorghum	$3.95/bu
Wheat	$5.50/bu
Long Grain Rice	$14.00/cwt
Medium Grain Rice	$14.00/cwt

Table 3. Parish yield assumptions used in calculating potential ARC-CO and PLC program payments.

Region	Parish	Covered Commodity	Yield (2014-18 Crop Years)
Southwest	Acadia	Long Grain Rice	73.0 cwt/ac
		Soybeans	36.0 bu/ac
Central	Avoyelles	Corn	160.0 bu/ac
		Soybeans	42.0 bu/ac
		Grain Sorghum	98.0 bu/ac
		Wheat	50.0 bu/ac
Northeast	East Carroll	Corn Irrigated	190.0 bu/ac
		Corn Non-Irrigated	180.0 bu/ac
		Soybeans Irrigated	62.0 bu/ac
		Soybeans Non-Irrigated	50.0 bu/ac
		Wheat	50.0 bu/ac
		Long Grain Rice	68.0 cwt/ac
Northwest	Caddo	Corn	140.0 bu/ac
		Soybeans	40.0 bu/ac

Tables 4 through 17 denote ARC-CO and PLC program payments (per base acre) are calculated for the selected parish. Program payment amount represents the FAPRI MYA price forecast coupled with an assumed parish yield from Table 2. The intent of this analysis is to present the variability of program payments relative to the difference in FAPRI's baseline price projections for the next five crop years. For the purposes of PLC payment calculations, it is assumed that the individual farm's CC program yield will be updated. It is further assumed that the farm's yield is representative of the parish yield from the 2008-2012 crop years.

Table 4. Potential farm program payments for long grain rice produced in Acadia parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$44.68	$0	$46.49	$0	$64.54
2015	$14.89	$75.38	$5.58	$68.61	$0	$53.26
2016	$27.33	$85.76	$11.82	$74.47	$0	$41.07
2017	$8.25	$84.40	$0	$70.83	$0	$41.07
2018	$0	$78.08	$0	$64.99	$0	$39.27

Table 5. Potential farm program payments for soybeans produced in Acadia parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$0	$0	$0	$0	$0
2015	$34.23	$0	$36.16	$0	$32.39	$0
2016	$13.27	$0	$18.74	$0	$12.14	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 6. Potential farm program payments for corn produced in Avoyelles parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$65.12	$20.04	$65.12	$30.06	$65.12	$20.04
2015	$65.12	$0	$67.36	$0	$50.28	$0
2016	$20.69	$0	$17.01	$0	$17.38	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 7. Potential farm program payments for soybeans produced in Avoyelles parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$7.52	$0	$6.45	$0	$4.67	$0
2015	$45.18	$0	$45.18	$0	$45.18	$0
2016	$26.99	$0	$33.38	$0	$25.69	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 8. Potential farm program payments for grain sorghum produced in Avoyelles parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$42.31	$38.89	$42.31	$38.89	$42.31	$33.87
2015	$42.74	$19.45	$42.74	$25.72	$42.74	$21.96
2016	$29.50	$12.55	$32.38	$15.06	$29.50	$12.55
2017	$0	$4.39	$0	$4.39	$0	$5.02
2018	$0	$0	$0	$1.88	$0	$2.51

Table 9. Potential farm program payments for wheat produced in Avoyelles parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$0	$0	$0	$0	$0
2015	$0	$0	$0	$0	$0	$0
2016	$6.74	$7.03	$6.85	$8.15	$8.86	$8.89
2017	$14.91	$0	$13.25	$0	$19.16	$3.70
2018	$0	$0	$0	$0	$0	$0

Table 10. Potential farm program payments for irrigated corn produced in East Carroll parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$79.34	$22.64	$79.34	$33.97	$79.34	$22.64
2015	$83.68	$0	$83.68	$0	$83.68	$0
2016	$32.28	$0	$27.88	$0	$28.40	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 11. Potential farm program payments for non-irrigated corn produced in East Carroll parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$55.40	$19.74	$68.71	$29.61	$55.40	$19.74
2015	$75.16	$0	$76.34	$0	$61.39	$0
2016	$31.95	$0	$27.76	$0	$28.27	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 12. Potential farm program payments for irrigated soybeans produced in East Carroll parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$0	$0	$0	$0	$0
2015	$63.26	$0	$63.26	$0	$63.26	$0
2016	$28.61	$0	$38.03	$0	$26.67	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 13. Potential farm program payments for non-irrigated soybeans produced in East Carroll parish, 2014-18.

Year	**September Baseline**		**October Baseline**		**November Baseline**	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$0	$0	$0	$0	$0
2015	$50.74	$0	$50.74	$0	$49.64	$0
2016	$18.43	$0	$26.02	$0	$16.86	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 14. Potential farm program payments for wheat produced in East Carroll parish, 2014-18.

Year	**September Baseline**		**October Baseline**		**November Baseline**	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$0	$0	$0	$0	$0
2015	$9.41	$0	$12.55	$0	$9.41	$0
2016	$22.49	$7.44	$29.49	$8.62	$29.67	$9.40
2017	$21.42	$0	$19.72	$0	$25.67	$3.92
2018	$0	$0	$0	$0	$0	$0

Table 15. Potential farm program payments for long grain rice produced in East Carroll parish, 2014-18.

Year	**September Baseline**		**October Baseline**		**November Baseline**	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$0	$46.50	$0	$48.38	$0	$67.17
2015	$0	$78.44	$0	$71.40	$0	$55.43
2016	$2.75	$89.24	$0	$77.50	$0	$42.74
2017	$3.08	$87.84	$0	$73.74	$0	$42.74
2018	$0	$81.26	$0	$67.64	$0	$40.86

Table 16. Potential farm program payments for corn produced in Caddo parish, 2014-18.

Year	**September Baseline**		**October Baseline**		**November Baseline**	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$22.49	$13.16	$34.39	$19.74	$22.49	$13.16
2015	$48.59	$0	$55.73	$0	$37.88	$0
2016	$20.01	$0	$16.78	$0	$17.13	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

Table 17. Potential farm program payments for soybeans produced in Caddo parish, 2014-18.

Year	September Baseline		October Baseline		November Baseline	
	ARC-CO	PLC	ARC-CO	PLC	ARC-CO	PLC
2014	$6.45	$0	$5.43	$0	$3.73	$0
2015	$40.66	$0	$40.66	$0	$40.31	$0
2016	$20.50	$0	$26.58	$0	$19.25	$0
2017	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0

As MYA price forecasts increase (decrease) the resulting effect on ARC-CO and PLC payments is a decrease (increase). It should be noted that there is a maximum ARC-CO payment per commodity per crop set at 10% of the benchmark revenue. There is no such limitation on PLC payments. All ARC-CO, PLC, and marketing loan gains are subject to an aggregated $125,000 payment limitation ($250,000 to include a spouse). Producer who elect to enroll a commodity on a FSA farm into the ARC program are ineligible to purchase SCO insurance coverage for that commodity on that farm. In summary, a great deal of patience that must be exhibited when analyzing potential ARC-CO and PLC program payments as both are dependent upon MYA prices. Utilizing all available MYA price information is key to evaluating program performance through the USDA-sponsored online farm bill decision tools. Specific to an individual producer's risk management strategy, the question should be posed: is the goal to maximize farm program payments or to mitigate price and yield risk through either the ARC-CO or the PLC program? Evaluating multiple price and yield scenarios is important in determining which program looks appealing relative to location (parish) and production history.

Additional information on farm program choice can be accessed through the LSU Agricultural Center's Department of Agricultural Economics and Agribusiness farm bill webpage at:
http://www.lsuagcenter.com/en/our_offices/departments/Ag_Economics_Agribusiness/extension_outreach/2014-Farm-Bill-Information/

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