What about Sunflowers?

The Farm Bill Team here at K-State has extensively looked at the economics of the Farm Bill commodity program decision for wheat, soybeans, sorghum, and corn, but what about sunflowers? In 2013 sunflowers grown in Kansas contributed almost 19.1 million in revenue (www.nass.usda.gov) and were grown in a number of different counties across Kansas. Many farmers have sunflower base acres and will have to make a program election by March 31st. The decision to elect Price Loss Coverage (PLC) or Agricultural Risk Coverage (ARC) is not an easy one since it will irrevocable for the next 5 years (or until the next Farm Bill). We can apply many of the same economic principles to sunflowers as we have to the other crops to help farmers make this decision.

To get the easy one out of the way first, let's look at PLC. This program pays when the Marketing Year Average (MYA) price falls below the "reference" price set in statue in the Farm Bill. The MYA takes the national average price each month and weights these prices by the amount of production sold in that month to come up with one price for the entire marketing year. Since sunflowers are a fall crop, the marketing year starts September 1st and runs through August 31st of the following year. We are only part-way through the marketing year for the 2014 crop, but the current USDA estimate for the MYA is $0.2150/pound. The reference price for sunflowers is $0.2015 (set for the entire life of the Farm Bill). With this current USDA estimate, PLC payments would not be made on 2014 sunflowers.

Another source of MYA price projections is the Food and Agricultural Policy Research Institute (FAPRI) out of the University of Missouri. They project long-term price outlooks for agricultural commodities on a monthly basis. Table 1 lists January 16th, 2015 estimates for sunflower seed.

Table 1. FAPRI Sunflower Seed Price Estimates and Associated PLC Payments

Marketing Year	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
FAPRI estimates ***($/pound)***	$0.2069	$0.1899	$0.1956	$0.2011	$0.2082
PLC Payment Rate ***($/pound)***	$0	$0.0116	$0.0059	$0.0004	$0
Payment per Acre ***(assuming 1100 pound program yield)***	$0	$12.76	$6.49	$0.44	$0
Total Payment ***(assuming 100 sunflower base acres)***	$0	$1,084.60	$551.65	$37.40	$0

If these prices hold true, PLC payments would be made 3 out of the 5 years of the Farm Bill. The payment rate (the difference between the estimated price and the reference price) is multiplied by the individual farm's program yield (Table 1 assumes 1100 pounds/acre) to get a per acre payment. This is multiplied by 85% of the farm's total sunflower base acres (Table 1 assumes 100 acres). Payments are modest, but keep in mind both the individual farm's program yield and sunflower base acre amount will greatly influence this. Also, this is all dependent on prices being exactly where they are predicted, and obviously there is a large margin of error surrounding the estimate in the later years.

ARC payments have even more uncertainty since they are based off of price and yield. The "benchmark" that sets the guarantee is also a moving target that is based off of the last 5 years of prices and yields. ARC-Individual combines all covered commodities grown on a farm to determine a guarantee and loss, so it cannot be evaluated on an individual crop level. We will focus on ARC-County only.

The ARC-County benchmark price is set as an Olympic average of the last 5 years of MYA prices (Table 2). An Olympic average drops the highest and lowest value and averages the remaining three values.

Table 2. Setting the ARC-County Benchmark Price for 2014/2015

2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015 Benchmark Price
$0.2015	$0.2330	$0.2910	$0.2540	$0.2140	$0.2300

The other half of the equation to determine the Benchmark Revenue is yield. Benchmark Yield is determined using an Olympic average of the last 5 years of county yields, so this will vary county by county. Benchmark Yield is multiplied by Benchmark Price to get Benchmark Revenue. There is a 14% deductible in ARC, so the ARC Guarantee will be 86% of the Benchmark Revenue.

The MYA price for the current year multiplied by the current year county yield will determine if an ARC payment is made. If the current year revenue is less than the guarantee, then payment will be made in the amount of the difference up until 10% of the benchmark revenue. This payment "cap" makes ARC a shallow loss coverage program. Like PLC, payment per acre is made on 85% of the sunflower base acres.

If FAPRI prices estimates hold true, the Benchmark Price will decline throughout the Farm Bill as high prices in the past get replaced with lower prices. Assuming the county yield remains stable, ARC payments will be made in 2015/2016 because of the large drop in price, but other years would not have payments (Table 3).

Table 3. ARC-CO Benchmark Prices and Associated Payments without Yield component

Marketing Year	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
FAPRI MYA current year estimates	$0.2069	$0.1899	$0.1956	$0.2011	$0.2082
ARC-CO Benchmark Price	$0.2300	$0.2337	$0.2250	$0.2055	$0.2012
Benchmark Price with 14% deductible	$0.1978	$0.2001	$0.1935	$0.1767	$0.1730
ARC Payment (without yield component)	$0	$0.0111	$0	$0	$0

Table 3 only compares the price side of ARC-County. A drop in the county yield could also trigger a payment, or a high current year county yield could raise current year revenue enough to take you out of a payment. If you have irrigated sunflowers and yield is more stable, you may be worried less about this risk and want more of a price guarantee. If you have dryland sunflowers, yield is always a risk and ARC-County may look more inviting than PLC because it considers yield loss at the county level.

To compare PLC and the price side of ARC-County, Table 4 shows the difference in the estimated ARC-County Benchmark Price with the 14% deductible and the PLC reference price.

Table 4. PLC Reference Price Compared to ARC-County Benchmark Price with 14% deductible

Marketing Year	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
PLC Sunflower Reference Price	$0.2015	$0.2015	$0.2015	$0.2015	$0.2015
Benchmark Price with 14% deductible	$0.1978	$0.2001	$0.1935	$0.1767	$0.1730
Difference	$0.0037	$0.0005	$0.0080	$0.0248	$0.0285

In all years of the Farm Bill, PLC payments would kick in quicker than ARC-County payments given that county yield is equal to the Benchmark Yield. Obviously assuming an average yield every year is unrealistic, but it is the most efficient way to compare the two programs. To look at the yield component, we will need to select an individual county as an example. Each county will have its own unique yield history, setting the Benchmark Revenue at different amounts. Every year new yields will enter into the 5-year Olympic average, and old years will drop out. It is a continuously moving guarantee. Therefore, here we will look at PLC payment versus ARC-County payments for 2014/2015 only. Ellsworth County, Kansas is used as an example.

Table 5. Ellsworth County ARC-County vs. PLC Payments for 2014/15 Marketing Year

County:	**Ellsworth**	**Irr. Type:**	**All**	**ARC**				**PLC**	
5 Yr. Olympic Avg. County Yield				1217		Program Yield		**1217.0**	
5 Yr. Olympic Avg. MYA Price				$0.2300		Reference Price		$0.2015	
Benchmark Revenue				$279.91					
		Yield							
		718	798	887	986	1095	**1217**	1339	1460
MYA Price	**PLC Payment**	**ARC Payment**							
$0.2530	$0.00	$27.99	$27.99	$16.31	$0.00	$0.00	$0.00	$0.00	$0.00
$0.2415	$0.00	$27.99	$27.99	$26.51	$2.60	$0.00	$0.00	$0.00	$0.00
$0.2300	$0.00	$27.99	$27.99	$27.99	$13.94	$0.00	$0.00	$0.00	$0.00
$0.2277	$0.00	$27.99	$27.99	$27.99	$16.21	$0.00	$0.00	$0.00	$0.00
$0.2231	$0.00	$27.99	$27.99	$27.99	$20.74	$0.00	$0.00	$0.00	$0.00
$0.2186	$0.00	$27.99	$27.99	$27.99	$25.18	$1.35	$0.00	$0.00	$0.00
$0.2142	$0.00	$27.99	$27.99	$27.99	$27.99	$6.17	$0.00	$0.00	$0.00
$0.2099	$0.00	$27.99	$27.99	$27.99	$27.99	$10.88	$0.00	$0.00	$0.00
$0.2057	$0.00	$27.99	$27.99	$27.99	$27.99	$15.48	$0.00	$0.00	$0.00
$0.2016	$0.00	$27.99	$27.99	$27.99	$27.99	$19.97	$0.00	$0.00	$0.00
$0.1976	$4.75	$27.99	$27.99	$27.99	$27.99	$24.35	$0.24	$0.00	$0.00
$0.1936	$9.61	$27.99	$27.99	$27.99	$27.99	$27.99	$5.11	$0.00	$0.00
$0.1897	$14.36	$27.99	$27.99	$27.99	$27.99	$27.99	$9.86	$0.00	$0.00
$0.1859	$18.99	$27.99	$27.99	$27.99	$27.99	$27.99	$14.48	$0.00	$0.00
$0.1822	$23.49	$27.99	$27.99	$27.99	$27.99	$27.99	$18.98	$0.00	$0.00
$0.1786	$27.87	$27.99	$27.99	$27.99	$27.99	$27.99	$23.36	$1.57	$0.00
$0.1750	$32.25	$27.99	$27.99	$27.99	$27.99	$27.99	$27.74	$6.39	$0.00
$0.1715	$36.51	$27.99	$27.99	$27.99	$27.99	$27.99	$27.99	$11.08	$0.00

On the top of Table 5 you can see that Ellsworth County has a 5-year Olympic Average County Yield for Sunflowers of 1217 pounds. With an Olympic Average MYA price of $0.23/pound, this sets Benchmark Revenue of ARC-County at $279.91. PLC assumes a program yield equal to the county average to reflect an "average" producer, however each farm will have its own program yield. If it is higher than 1217 pounds, PLC payments will grow quicker with a lower MYA price (and vice versa). Payments listed are on a per acres basis, which would be paid on 85% of sunflower base acres.

In the table you can see a range of possible MYA prices that could occur for sunflowers in the 2014/2015 marketing year. Notice PLC payments do not kick in until the MYA falls below $.2015, which is the PLC reference price. ARC-County payment will kick in at a variety of prices and yields (since it is based on revenue), so the rest of the table shows payments at those various combinations.

With a current county average yield equal to the benchmark yield (1217 bushels), price will need to fall below $0.1978 before ARC-County payments are made, however PLC payments will also be made and are greater than ARC-CO payments. If the current year county yield is less than the benchmark yield, ARC-County payment will kick in quicker and exceed PLC payments until price is below $0.1786. Notice that ARC-County payments cap out at $27.99, which is 10% of the benchmark revenue. If the opposite is true and current year county yield is greater than the benchmark yield, price will have to drop extremely low before ARC-County payments are made.

In short, the decision to elect PLC or ARC-County on sunflowers still comes down to personal preference. PLC will alleviate price risk better than ARC-County, but if low yield occurs ARC-County could potentially pay more. To evaluate your individual situation, K-State and Oklahoma State have partnered to develop a Microsoft Excel decision tool. This is available on our website at www.AgManager.info along with many other Farm Bill resources. Please contact your local extension agent or myself (Robin Reid) with questions.

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