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## 2014 Farm Bill: Historical Likelihood of County ARC and SCO Payments for Soybeans in Illinois

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The *farmdoc daily* posts on [May 8<sup>th</sup>](#) and [May 15<sup>th</sup>](#) analyzed the County Ag Risk Coverage (ARC) and Supplemental Coverage Option (SCO) programs created in the 2014 Farm Bill. County ARC is one of the optional commodity programs available to producers of eligible program crops, while SCO is an optional insurance program which supplements the producer's underlying individual plan of insurance. Both programs have "shallow loss" coverage designs: payments are triggered when actual revenues or yields fall below a specific guarantee, and are capped at a percentage of the value of the guarantee (details on the new commodity program options can be found in *farmdoc daily* [February 20, 2014](#); details on SCO can be found in *farmdoc daily* [February 27, 2014](#) and [April 24, 2014](#); all posts in our continuing series on the 2014 Farm Bill can be accessed [here](#)). Today's post extends the historical analysis of County ARC and SCO to soybeans in Illinois. Since the decision to use the County ARC (or Individual ARC) program limits the producer's eligibility to use SCO, analysis comparing these programs should be useful in making program decisions.

### Historical Analysis

Illinois county yield data and national marketing year average prices for soybeans from 1972 through 2013 were collected from NASS. While the final 2013 MYA price will not be determined until the end of August, the current estimate of \$12.70 per bushel for soybeans is used. Soybean futures price data was also used to collect base and harvest insurance prices over the same time period. This historical data was then used to put together an historical analysis of the county ARC and SCO programs from 1977 through 2013 (the 1972 to 1976 data was needed to develop county ARC revenue guarantees beginning in 1977).

For each year in the analysis, actual revenues or yields were compared to their respective program guarantees to determine if program payments would have been triggered. County ARC triggers payments if actual revenue (MYA price times county yield) falls below 86% of the benchmark revenue (based on previous 5 years of MYA prices and county yields). SCO triggers payments if actual revenue (harvest price times county yield) or yield falls below expected revenue or yield (based on county trend yields and base insurance prices).

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The historical analysis was done under the following assumptions:

- The minimum soybean price used in setting the ARC program benchmark price was \$6.00 from 1972 through 2008, and \$8.40 from 2009 through 2013. The \$6.00 price represents the most recent counter-cyclical program target price for soybeans, and is very close to the average MYA price over that time period. The \$8.40 price is the reference price defined for soybeans in the 2014 Farm Bill, and the level used to set the minimum ARC guarantee for the current program in 2014 and beyond.
- County trend yields used to determine expected yield or revenue for the SCO program were estimated using a simple linear trend regression over the 1972 to 2013 period.

## Results and Discussion

Table 1 below reports the likelihood of County ARC and SCO payments being triggered on soybean acres over the historical period. The likelihoods reported are averages across all the estimated likelihoods for individual counties in Illinois. County ARC payments for soybeans would have been triggered nearly 1 out of every 5 years in Illinois counties.

The likelihood of SCO payments being triggered on soybean acres varies by the type of SCO coverage. When SCO is coupled with a yield protection policy (YP), payments were estimated to occur in 13.3% of years. The likelihood of SCO payments being triggered increases when coupled with revenue policies. SCO combined with revenue protection with the harvest price exclusion triggered payments across IL counties in 20.8% of the years included in the analysis. The average likelihood of SCO payments when combined with revenue protection increases to nearly 28%.

Note that these average historical likelihoods are lower than those found for corn (see table 1 in *farmdoc daily May 8, 2014*), but the comparison across programs is similar. County ARC payments, on average, have been more likely historically than SCO coupled with YP. The likelihood of payments on soybean acres in Illinois for County ARC and SCO with RP-HPE are fairly similar; SCO with RP would have been more likely to trigger a payment than County ARC for soybeans.

Also reported in table 1 are the minimum and maximum likelihoods of program payments being triggered in Illinois counties. The historical likelihood of County ARC payments being triggered on soybean acres ranges from just 10.8% to 27% of the years in the historical analysis. The range of likelihoods for SCO payments being triggered is also provided in table 1. SCO with YP triggered payments in as few as 2.7% to as many as 29.7% of the years included in the analysis. The likelihood of SCO payments when combined with RP ranges from 16.2% to over 43%.

**Table 1. Likelihood of County ARC and SCO Payments on Soybean Acres in IL Counties, 1977 to 2013**

	SCO with:			
	County ARC	YP	RP-HPE	RP
Likelihood	19.3%	13.3%	20.8%	27.9%
Minimum	10.8%	2.7%	10.8%	16.2%
Maximum	27.0%	29.7%	32.4%	43.2%

Note: Likelihood represents the probability of an ARC/SCO payment being triggered in a given year based on the historical analysis, averaged across all IL counties. Minimum and maximum values are historical likelihoods for specific counties.

The maps in figures 1 through 4 illustrate the county-level historical likelihoods of program payments being triggered, illustrating the variation in historical program performance across all Illinois counties. From figure 1, the historical likelihood of County ARC payments being triggered on soybean acres is relatively higher in northern and southern IL counties.

Figure 2 shows that counties in southern IL have the greatest historical likelihood of having SCO payments triggered when combined with a YP policy. The likelihood of SCO payments being triggered on soybean acres when combined with RP-HPE and RP plans increases relative to SCO use with YP. The historical likelihood of SCO with RP-HPE tends to be higher in southern and eastern counties. Southern Illinois counties also had a higher historical likelihood of SCO with RP payments being triggered. These results illustrate the higher relative amount of soybean yield variability in the southern region of the state.

**Figure 1. Likelihood of County ARC Payments on Soybean Acres in IL, 1977 to 2013**

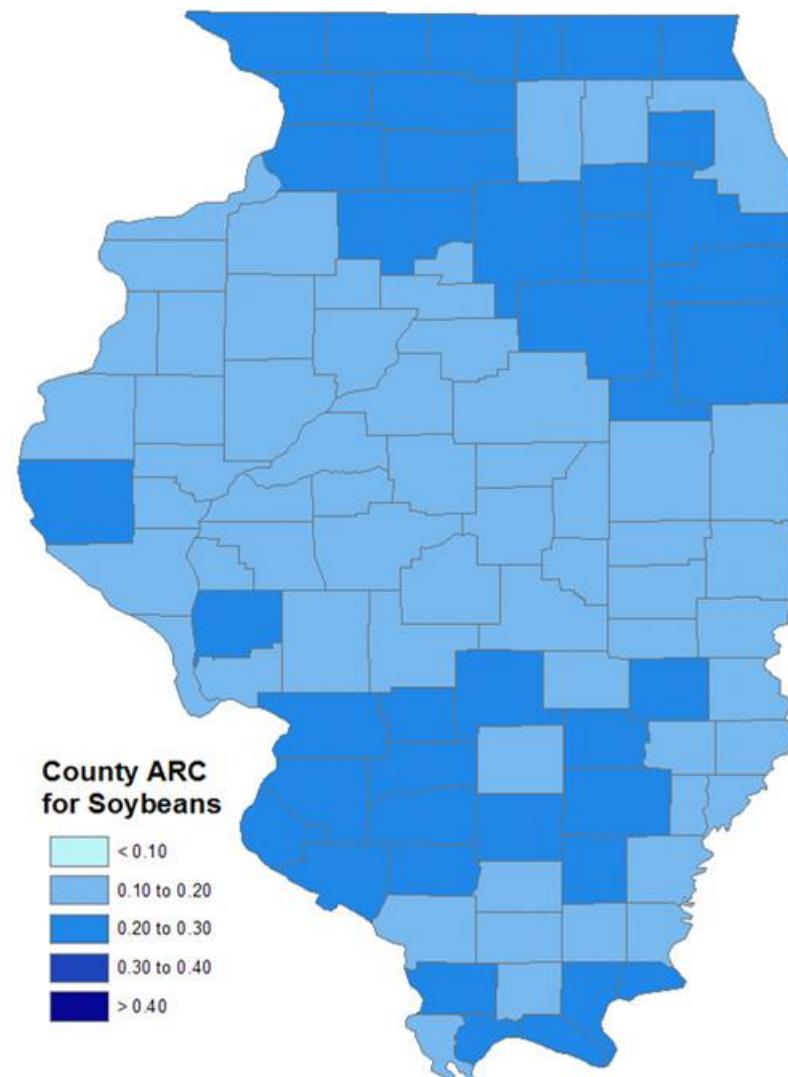


Figure 2. Likelihood of SCO with YP Payments on Soybean Acres in IL, 1977 to 2013

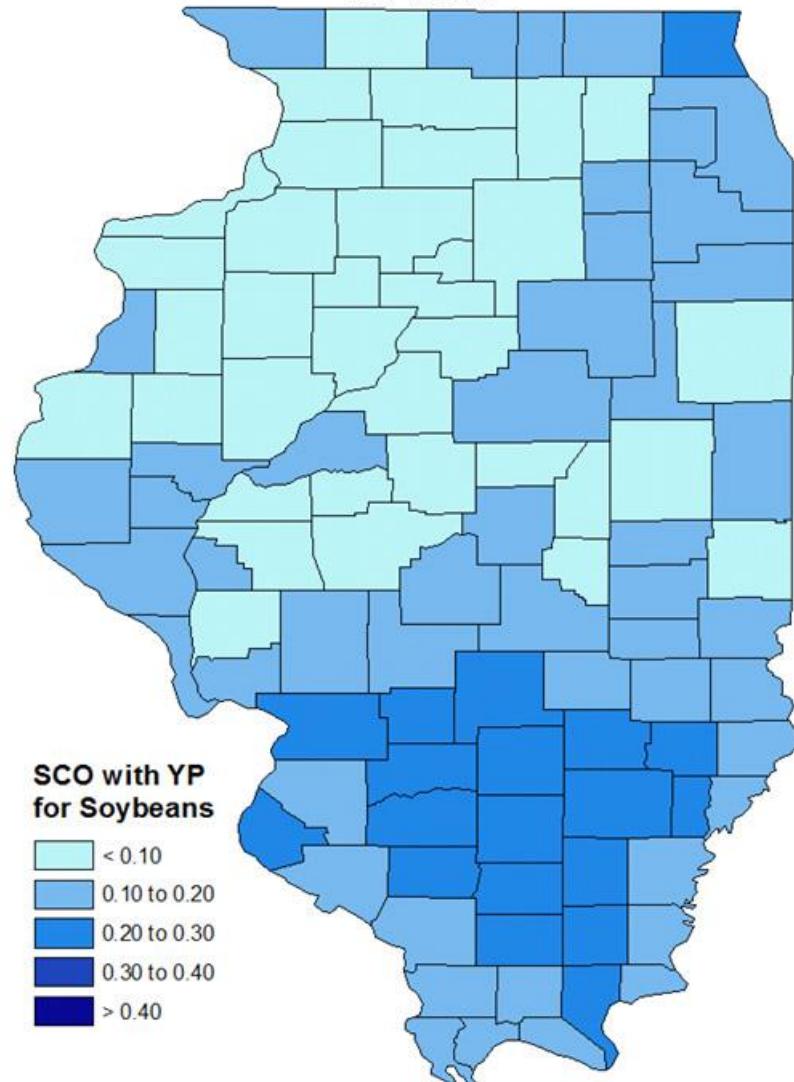


Figure 3. Likelihood of SCO with RP-HPE Payments on Soybean Acres in IL, 1977 to 2013

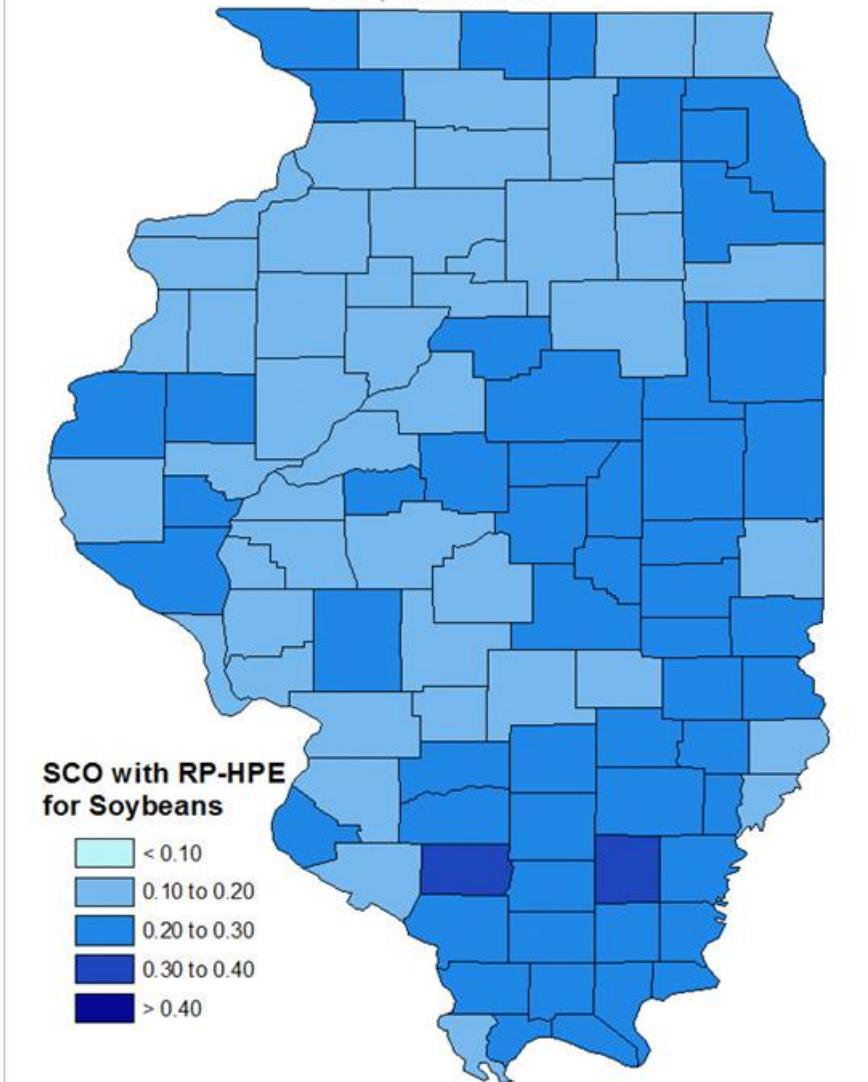
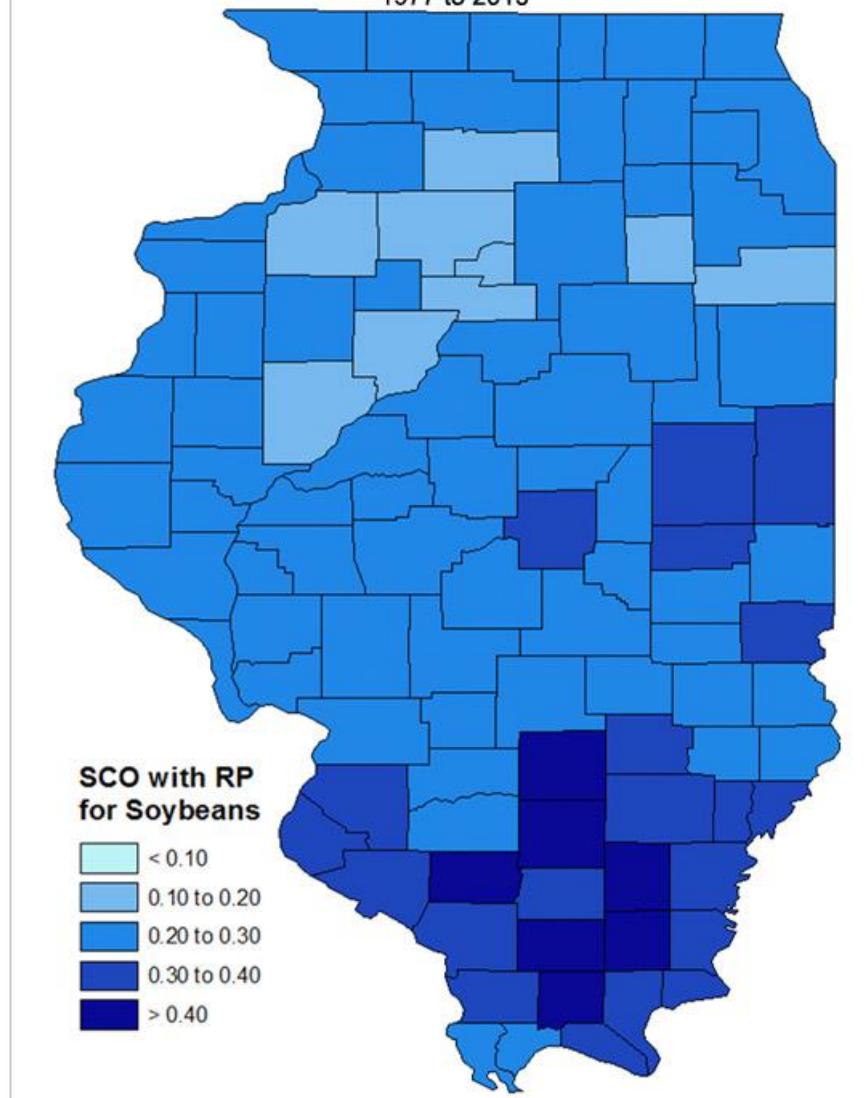


Figure 4. Likelihood of SCO with RP Payments on Soybean Acres in IL, 1977 to 2013



Note that while the size of SCO coverage does change with the coverage level chosen for the individual insurance plan, the likelihood estimates reported in table 1 and illustrated in figures 1 to 4 do not change since the trigger remains at 86% of expected yield or revenue. Only the amount of coverage, or potential size of the SCO payment, would change at different insurance plan coverage levels.

### Conclusions

Based on historical price and yield data, the likelihood of County ARC program payments on soybean acres tends to exceed that of SCO payments when coupled with yield insurance. However, SCO payments when coupled with revenue insurance have a greater historical likelihood of being triggered than the County ARC program, particularly in the case of SCO with RP. This provides some additional information for producers and landowners to consider when making choices among programs.

In Illinois, crop producers have strong preferences for revenue insurance products at the higher end of the available coverage level range (*farmdoc daily* April 29, 2014). If one assumes that farmers do not significantly alter their crop insurance choices, the analysis in this post shows that IL producers will need to compare the potentially lower likelihood of County ARC payments with the greater likelihood of SCO program payments when used with revenue insurance with the different premium costs associated with

individual coverage alone versus individual coverage plus SCO. This is true for the analysis provided today for soybean acres, as well as the previous analysis done for corn acres (*farmdoc daily* [May 8, 2014](#)).

Additional analysis will be performed as information becomes available regarding specific regulations about the programs from the Farm Service and Risk Management Agencies. The historical likelihood estimates provided in today's post do not allow for comparisons between the timing and potential size of net program payments.

Future posts will continue to examine the historical analysis for individual counties to identify conditions under which each program option triggers payments. Premium rate information for the SCO program from RMA will be required for a more thorough comparison of the expected net benefits associated with the various available forms of supplemental coverage. Ultimately, producers will need to compare specific strategies which might involve the use of the combination of a commodity program with crop insurance of different types and coverage levels.

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