FACTORS AFFECTING 2014 FARM BILL COMMODITY PROGRAM ENROLLMENT FOR KANSAS FARMERS

by

Mykel R. Taylor, Glynn T. Tonsor, and Candice Wilson

Selected Paper
AAEA Annual Meeting – Chicago, IL
July 2017

From the implementation of the first farm bill in the United States with the Agricultural Adjustment Act (AAA) of 1933, various commodity producer protection programs have seen a rise and fall within the agricultural sphere. As the agricultural industry has evolved from a time of high labor inclusion rates, modest productivity and high government intervention as was the case in the 1930s and 40s, to its current state of large sums of land being very effectively utilized by a small number of farmers, such has been the change in farm subsidies offered by the various farm bills from 1933 to 2014. These changes are illustrated by the development of farm programs from production controls and parity income discussions during the early years of farm bills to the current revenue protection and support programs utilized in 2014.

This paper analyzes the two major programs of the 2014 Farm Bill and illustrates how conditions of incomplete information played a role in Kansas producers' enrollment choices in the Agriculture Risk Coverage (ARC) and Price Loss Coverage (PLC) programs. Three primary research questions have been identified for this analysis to provide a contribution to the literature: i) What factors affected producer enrollment in commodity programs at both the aggregate and individual level? ii) What role did incomplete information play in determining program selection? (That is, did producers have to rely on alternative criteria to select a program given a lack of quality information available for their primary enrollment considerations?) iii) What do the results of this research suggest for the development and implementation of future farm policy?

An empirical model is estimated using survey data collected from attendees of farm bill program information meetings conducted by K-State Research and Extension Services in the winter of 2015. Attendees stated their preference for one of two farm bill programs, allowing

estimating of a logit model to determine the factors (e.g. risk preferences, farm operation characteristics, operator demographics) that influence program preference.

As agricultural production represents the largest sector of the Kansas economy, valued at over $64 million annually (43% of the total economy), the analysis enrollment is crucial in giving insight into producers' decision-making processes (Floros 2016). Termination of payments, land price changes as a result of mass farm foreclosures, federal spending concerns, and commodity supply changes are all potential threats facing agriculture that could be affected by the safety net program that producers selected. Additionally, the current downturn facing the agricultural sector coupled with political pressure to reduce federal expenditures only intensifies the need for an effective and economically sustainable safety net. Due to the nature of the one-time enrollment for the five-year life of the 2014 Farm Bill, it is imperative to understand how producers made their program selection. Understanding this decision-making process will assist in mitigating any potential risks for future farm legislation based off of potential losses that producers (or government entities responsible for distributing subsidies) might face if catastrophic losses occur.

Literature Review

For both the PLC and ARC programs, pricing and/or yield estimates were largely unknown for later years of the legislation and led to producers enrolling in a program based on incomplete market information. Therefore it is important to understand how producers made this enrollment decision given their risk profiles. By jointly estimating parameters for individual risk preferences and production functions, Chavas and Holt (1996) were able to analyze what behaviors producers exhibited when making decisions under conditions of uncertainty. Their research utilized corn-soybean allocation choices under production and price uncertainty from

1954-1985. Special care was given to capture the effect of farm policy programs on prices and incomes received at the farm level. The results of the analysis indicated that corn-soybean farmers displayed downside risk aversion as well as decreasing absolute risk aversion (Chavas and Holt 1996).

According to research by Martin Weber (1987), traditional subjective expected utility theory's strong information assumptions can be relaxed in order to create a framework for individuals to make decisions under conditions of uncertainty. His approach sought to make the theoretical decision-making framework more applicable to real-life scenarios. Weber argued that a general model for decision-making under conditions of incomplete information could be developed by aggregating an individual's attributed preferences and allowing for alternatives to be ranked. In order for this framework to be applicable, the function of preferences and ranked alternatives must implicitly or explicitly answer four basic questions:

1. What is the value of a decision's consequence on the desired objective of a decision?
2. What is the individual's risk profile for the given decision?
3. What is the aggregation of evaluation for objectives for each consequence?
4. What is the aggregation of consequences for each objective? (Weber 1987).

Producers enrolling in 2014 Farm Bill programs would likely have followed a similar framework in selecting a commodity program. A producer would have selected a program given their individual risk preferences, desired objectives for Farm Bill program utilization (minimize losses, maximize payments, etc.), and any potential consequences they foresaw for each program option.

In conjunction with Federal Crop Insurance programs, Kansas producers utilize commodity program selections available under the 2014 Farm Bill as an ad-hoc method of risk management for their farming operation. Various studies have attempted to standardize risk management priorities for a given subset of producers based on characteristics such as farming experience, farm size, etc. with mixed results. Utilizing Agricultural Resource Management Survey (ARMS) data, Cole and Kirwan (2009) analyzed the factors effecting a producer's decision to hedge their crop—a decision used as a proxy for engaging in risk management strategies. The data included information from over 50,000 commercial farms between the years 1999 to 2005. By using a linear probability model, they were able to estimate specific farm and producer characteristics to estimate the likelihood of the farm engaging in hedging.

Their research yielded several key results. In broad terms, risk management practices for farms behave similarly to those of households or firms. However, they also found evidence to suggest that farms did not follow financial theory. Key findings of their analysis indicate that older farmers were shown to be less likely to engage in hedging their crops. This could be due to a variety of factors such as lower levels of technological literacy. A producer's experience as well as their education levels proved to have little to no significant impact on a producer's decision to engage in hedging practices. Lastly, their results suggested that farms that grow a larger variety of crops are less likely to engage in hedging activities as their business is sufficiently diversified in order to mitigate the effects of risk (Cole and Kirwan 2009).

Plastina and Hart (2014) determined commodity program selection was a function of an individual's price and yield expectations, the producer's production model, as well as a producer's unique risk profile. In their study, they utilized the Iowa State University Farm Bill

Analyzer Microsoft Excel tool[1] to conduct a Monte Carlo simulation of prices and yields in order to calculate randomized estimated payments. The results of their research indicated that price expectations were an important component in the expected payment calculation. They also concluded that differing risk profiles caused some producers to enroll in programs that did not maximize anticipated payment values. Risk averse producers concerned about low yields and prices, for instance, could be more inclined to select a program that did not maximize payment, but instead, minimized potential losses. The results of their research indicate that payment maximization, while an important program selection determinant, did not fully explain how producers were making their enrollment decisions. Furthermore, their research suggests that there are a variety of factors that cannot be captured when analyzing the roll that risk management plays on an individual producer's program choice (Plastina and Hart 2014).

Revenue based farm support programs were not utilized prior to the 2008 Farm Bill when the Average Crop Revenue Election (ACRE) program was introduced. This prevented extensive analysis from being conducted about the benefits and losses of such a program for different stakeholders or to attempt to determine the mechanisms by which a producer made an enrollment decision. Despite their differences, ARC and ACRE both required producers to reevaluate what role they desired their farm safety nets to serve. While a more complex decision, electing to enroll in a revenue protection program gave producers the opportunity to better protect themselves from downside risk since yield and price components were both factored into triggering a payment in the new revenue based system. Understanding potential factors

[1] This tool utilized historical and user-provided data to project potential farm and county yields. Additionally, producers were able to select from three separate price forecasts and anticipated price volatility levels in order to estimate a payment value based on their market expectations.

contributing to ACRE enrollment is crucial in making informed assumptions about the thought process implemented by producers in selecting ARC in 2014.

Data and Methods

As the literature review suggests, there is little substantive research that has the ability to accurately and specifically identify individual producers' farm policy program preferences. Also, given that the current programs had not been utilized in previous legislation, the considerations made by producers in 2014 are currently unknown. The survey design implemented in this research closely follows Mitchell et al. (2012) and includes such factors as producer demographics, risk preferences, education and information sources, price and yield expectations, program expectations, and whether or not a producer had participated in the ACRE program in 2009. The results of this analysis will be one of the first of its kind in analyzing factors affecting ARC enrollment and will contribute to the available research regarding producer selection of a revenue based program. Additionally, it will provide insight for policymakers designing future farm bills to understand the evolution of producer enrollment considerations from ACRE to ARC. Enrollment breakdowns by crop in addition to base acreage (prior to allowable updates under the 2014 bill) can be found in table 1.

Table 1. 2014 Farm Bill Program Percent Enrollment and Base Acreage by Crop

Crop	ARC-CO Enrollment	PLC Enrollment	ARC-I Enrollment	Base Acreage
Wheat	66.4%	33.4%	0.2%	49.5%
Corn	76.3%	23.4%	0.3%	21.1%
Soybeans	78.9%	0.2%	20.9%	12.9%
Grain Sorghum	44.9%	55.0%	0.1%	15.6%

The analysis is based on surveys designed by faculty and staff of the Agricultural Economics Department at Kansas State University. The two surveys were collected before and after explanatory educational efforts at fifteen out of 179 Farm Bill program information meetings. These meetings were conducted across the state of Kansas between October of 2014 and March of 2015 and attended by over 11,000 farmers, landowners, and farm managers.

In total, approximately 1,400 producers completed both a pre and post survey that could be used in the cross comparison analysis and individual program models. The surveys included questions such as an attendee's classification (farmer, landowner, manager, lender, etc.), the number of acres owned and rented, the number of years of experience, participation in farm and commodity groups, a producer's choice in information sources (meetings, online videos, newspapers, talking with other producers, etc.), anticipated annual payouts, expectations of future yields and prices, anticipated program selection both before and after program information was provided, insurance coverage, as well as statements that attempted to quantify risk preferences. It is important to note that the survey only captured expected payments, program choice, and crop selection for a respondent's largest FSA farm.

The individual survey responses were analyzed utilizing a logit model. As previously stated, producers were asked to indicate which of the three programs they intended to enroll in for each of the crops their farm had base acreage allocated to. The dependent variable *(ARC-CO)*\ in this model reflects if the respondent indicated that ARC was their preferred program choice. It is set equal to one if the respondent chose ARC and equal to zero if they chose PLC. The empirical model is specified as follows

(2) $$z_i = f(Days_t, Title_{i,}, Experience_i,\ Income_i, OwnAcres_i, RentAcres_i, ACRE2009_i,$$
$$Coverage_i, RiskAttitude_i, KSUPay_c, HighPay_i, LowPay_i,$$
$$InPerson_i, Online_i, PrintNews_i, RadioTV_i, OtherProd_i, OtherSource_i,$$
$$KFB_i, AFB_i, KSCommodity_i, FU_i, OtherMember_i, ARCCORisk_i,$$
$$PLCRisk_i, DkRisk_i, ARCCOPay_i, PLCPay_i, DkPay_i,\ BaseUpdate_{i,}\ BaseNo_{i,}, BaseDK_{i,}\ Split_{i,}),$$

where the subscript *i* denotes a variable specific to the respondent, the subscript *t* denotes a variable specific to one of the 15 meeting locations, and the subscript *c* denotes a variable specific to the county in which the respondent lives.

Days represents the length of time a meeting (and therefore a survey response) was from the FSA sign-up deadline. It varied by location and ranged from 53 to 85 days. The *Title* variable represents a categorical variable if a survey respondent identified as a producer or not. The percentage of income that a respondent derived from production comprises the *Income* variable. *OwnAcres* and *RentAcres* are continuous variables for a producer's total acreage. *ACRE2009* represents if a producer stated they enrolled in the ACRE program. *Coverage* denotes the percent coverage a producer has enrolled through federal crop insurance. A Likert Scale was utilized to create the variable *RiskAttitude.* It is measured on a 5-point scale (1=Strongly Agree, …, 5=Strongly Disagree) for the following statement: "I accept more risk in my farming business than other crop producers." The same payment calculation that was included in the aggregate model represents the variable *KSUPay.* The variables *HighPay* and *LowPay* are categorical variables that attempt to capture changes to payment expectations caused by educational efforts. Respondents were asked on both the pre and post survey to select what range of payments they anticipated their preferred program to payb. If a respondent's payment expectations were higher for their selected program choice on the pre survey than the post survey, they were designated as

"*HighPay.*" Conversely, if a respondent's expectations were higher after engaging in educational efforts, they were classified as "*LowPay.*" *InPerson, Online, PrintNews, RadioTV, OtherProd* (other producers), and *OtherSource* represented where producer's received their information regarding program specifics. Respondents completing the survey had the option of selecting multiple sources. Additionally, *KFB* (Kansas Farm Bureau), *AFB* (American Farm Bureau), *KSCommodity* (i.e. Kansas Corn Growers Association, Kansas Soybean Association, etc.), *FU* (Farmers' Union), and *OtherMember* were categorical variables representing respondents' affiliation with various farm organizations.

The variables *ARCCORisk, PLCRisk, and DkRisk* were utilized in an indicator variable that dropped *ARCCORisk*. Producers were asked to select which program they felt offered better risk protection over the life of the Farm Bill—ARC, PLC or did not know. The same method was used for the variables *ARCCOPay, PLCPay, and DkPay.* Producers were asked to identify which program they felt would offer the highest payout for their FSA farm—ARC, PLC, or did not know. Indicator variables were also created if a producer intended to update their base acreage (*BaseUpdate)*, did not intend to update (*BaseNo),* or if they had not yet decided if they would update their information (*BaseDK)*. Lastly, the dummy variable *Split* was created to represent if the producer's FSA farm number was located in a county designated by FSA as eligible for separate irrigated and non-irrigated payments. As no specific survey question addressed production methods, the creation of the *Split* variable was necessary in order to account for the possibility that a producer could have made separate decisions for their irrigated and non-irrigated acres. A logit was then used to regress the model. After checking for model misspecification, the marginal effect of each variable was then found. This process was repeated for the remaining three crops.

Complete summary statistics are available in tables 2-5. Intended enrollment in ARC ranged from nearly 67% for wheat to 33% for grain sorghum. Corn and soybean ARC preferences were 52% and 43%, respectively. Average experience across all crops analyzed was 29.29 years with roughly 74% of respondents' incomes being derived from crop production. Large farm acreage discrepancies caused high standard deviations in acres owned and rented with 987 and 1265 being the average. For all four crops, respondents identified as having slightly above average risk aversion with a Likert Scale mean of 3.65. In-person meetings and other producers served as the most popular information sources while membership in the Kansas Farm Bureau served as the most popular affiliation with an agricultural organization/industry group. Grain sorghum had the fewest respondents from split counties at less than 2%. Wheat had 6.5% followed by soybeans (16.1%) and corn (33%).

Table 2. Wheat Individual ARC Enrollment Summary Statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
Dependent Variable					
ARC-CO	Binary variable equal to 1 if ARC-CO was preferred program after education	.6670	.4715	0	1
Explanatory Variables					
Days	Number of days prior to enrollment deadline educational meeting was attended	71.0176	10.0613	53	85
Title	Binary variable equal to 1 if respondent identified as a producer	.3740	.4841	0	1
Experience	Number of years involved in production agriculture	29.0649	15.4366	0	70
Income	Percentage of income derived from agriculture	73.6013	28.3978	0	100
OwnAcres	Number of agricultural acres owned	1008.545	1842.167	0	35,000
RentAcres	Number of agricultural acres rented	1295.186	2079.982	0	31,000
ACRE2009	Binary variable equal to 1 if respondent enrolled in ACRE program during previous Farm Bill	.1947	.3962	0	1
Coverage	Percentage of crop insurance coverage carried on wheat acres	40.7173	36.2398	0	85
RiskAttitude	Likert scale response to statement: "I accept more risk in my farming business than other crop producers."	3.6451	1.1296	1	5
KSUPay	K-State estimate of 2014 county payment for ARC-CO per acre	21.3585	9.8621	0	34.76
HighPay	Binary variable equal to 1 if expected payment from preferred program was higher after attending educational meeting	.1111	.3144	0	1
LowPay	Binary variable equal to 1 if expected payment from preferred program was lower after attending educational meeting	.2871	.4527	0	1

Table 2. Wheat Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Information Sources	Categorical variables denoting sources of information on the Farm Bill				
InPerson	Binary variable equal to 1 if source is in-person meetings	.7184	.4500	0	1
Online	Binary variable equal to 1 if source is online materials	.2167	.4122	0	1
PrintNews	Binary variable equal to 1 if source is newspaper or magazine	.5358	.4990	0	1
RadioTV	Binary variable equal to 1 if source is radio or television	.1947	.3962	0	1
OtherProd	Binary variable equal to 1 if source is other producers	.5875	.4926	0	1
OtherSource	Binary variable equal to 1 if source is from other outlets	.1320	.3387	0	1
Industry Membership	Categorical variables denoting membership in various groups				
KFB	Binary variable equal to 1 if member of Kansas Farm Bureau	.5688	.4955	0	1
AFB	Binary variable equal to 1 if member of American Farm Bureau	.0451	.2076	0	1
KSCommodity	Binary variable equal to 1 if member of a Kansas commodity group	.1859	.3893	0	1
FU	Binary variable equal to 1 if member of Farmers Union	.0308	.1729	0	1
OtherMember	Binary variable equal to 1 if member of other organization	.0506	.2193	0	
Risk Protection	Categorical variables indicating the program with best risk protection				
PLCRisk	Binary variable equal to 1 if selected PLC	.3289	.4701	0	1
DkRisk	Binary variable equal to 1 if selected “Don’t Know”	.1778	.3825	0	1
Highest Payout	Categorical variables indicating the program with highest annual payout				
PLCPay	Binary variable equal to 1 if selected PLC	.1718	.3774	0	1
DkPay	Binary variable equal to 1 if selected “Don’t Know”	.3060	.4611	0	1

Table 2. Wheat Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Highest Payout	Categorical variables indicating the program with highest annual payout				
PLCPay	Binary variable equal to 1 if selected PLC	.1718	.3774	0	1
DkPay	Binary variable equal to 1 if selected "Don't Know"	.3060	.4611	0	1
Updating Base Acreage	Categorical variables indicating preference for updating base acreage				
BaseNo	Binary variable equal to 1 if selected "No"	.1054	.3073	0	1
BaseDk	Binary variable equal to 1 if selected "Don't Know"	.3187	.4662	0	1
Split	Binary variable equal to 1 if farm resides in a county designated by FSA as eligible for split irrigated and non-irrigated payments	.0638	.2445	0	1

Observations: 909

Table 13. Corn Individual ARC Enrollment Summary Statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
Dependent Variable					
ARC-CO	Binary variable equal to 1 if ARC-CO was preferred program after education	.5248	.4996	0	1
Explanatory Variables					
Days	Number of days prior to enrollment deadline educational meeting was attended	70.6960	10.3865	53	85
Title	Binary variable equal to 1 if respondent identified as a producer	.4493	.4978	0	1
Experience	Number of years involved in production agriculture	28.8120	15.3446	0	70
Income	Percentage of income derived from agriculture	76.5432	26.8027	0	100

Table 3. Corn Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
OwnAcres	Number of agricultural acres owned	1116.139	2057.867	0	35,000
RentAcres	Number of agricultural acres rented	1442.267	2258.044	0	31,000
ACRE2009	Binary variable equal to 1 if respondent enrolled in ACRE program during previous Farm Bill	.2217	.4157	0	1
Coverage	Percentage of crop insurance coverage carried on corn acres	36.8135	36.6727	0	85
RiskAttitude	Likert scale response to statement: "I accept more risk in my farming business than other crop producers."	3.6070	1.1066	1	5
KSUPay	K-State estimate of 2014 county payment for ARC-CO per acre	27.5224	29.0274	0	104.742
HighPay	Binary variable equal to 1 if expected payment from preferred program was higher after attending educational meeting	.1175	.3222	0	1
LowPay	Binary variable equal to 1 if expected payment from preferred program was lower after attending educational meeting	.2863	.4524	0	1
Information Sources	Categorical variables denoting sources of information on the Farm Bill				
InPerson	Binary variable equal to 1 if source is in-person meetings	.7533	.4314	0	1
Online	Binary variable equal to 1 if source is online materials	.2511	.4340	0	1
PrintNews	Binary variable equal to 1 if source is newspaper or magazine	.5301	.4995	0	1
RadioTV	Binary variable equal to 1 if source is radio or television	.2247	.4177	0	1

Table 3. Corn Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
OtherProd	Binary variable equal to 1 if source is other producers	.5962	.4910	0	1
OtherSource	Binary variable equal to 1 if source is from other outlets	.1322	.3389	0	1
Industry Membership	Categorical variables denoting membership in various groups				
KFB	Binary variable equal to 1 if member of Kansas Farm Bureau	.5918	.4919	0	1
AFB	Binary variable equal to 1 if member of American Farm Bureau	.0543	.2268	0	1
KSCommodity	Binary variable equal to 1 if member of a Kansas commodity group	.2217	.4157	0	1
FU	Binary variable equal to 1 if member of Farmers Union	.0308	.1730	0	1
OtherMember	Binary variable equal to 1 if member of other organization	.0646	.2460	0	1
Risk Protection	Categorical variables indicating the program with best risk protection				
PLCRisk	Binary variable equal to 1 if selected PLC	.3304	.4707	0	1
DkRisk	Binary variable equal to 1 if selected “Don’t Know”	.1755	.3807	0	1
Highest Payout	Categorical variables indicating the program with highest annual payout				
PLCPay	Binary variable equal to 1 if selected PLC	.1507	.3580	0	1
DkPay	Binary variable equal to 1 if selected “Don’t Know”	.2836	.4511	0	1
Updating Base Acreage	Categorical variables indicating preference for updating base acreage				
BaseNo	Binary variable equal to 1 if selected "No"	.1003	.3006	0	1
BaseDk	Binary variable equal to 1 if selected “Don’t Know”	.2886	.4535	0	1
Split	Binary variable equal to 1 if farm resides in a county designated by FSA as eligible for split irrigated and non-irrigated payments	.3113	.4634	0	1

Observations: 681

Table 4. Soybeans Individual ARC Enrollment Summary Statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
Dependent Variable					
ARC-CO	Binary variable equal to 1 if ARC-CO was preferred program after education	.4304	.4954	0	1
Explanatory Variables					
Days	Number of days prior to enrollment deadline educational meeting was attended	72.3251	11.5209	53	85
Title	Binary variable equal to 1 if respondent identified as a producer	.4669	.4994	0	1
Experience	Number of years involved in production agriculture	29.4124	15.1374	0	70
Income	Percentage of income derived from agriculture	76.0832	26.1457	0	100
OwnAcres	Number of agricultural acres owned	918.6777	2022.511	0	35,000
RentAcres	Number of agricultural acres rented	1191.006	1786.81	0	21,000
ACRE2009	Binary variable equal to 1 if respondent enrolled in ACRE program during previous Farm Bill	2136	.4102	0	1
Coverage	Percentage of crop insurance coverage carried on soybean acres	37.7165	36.7425	0	85
RiskAttitude	Likert scale response to statement: “I accept more risk in my farming business than other crop producers.”	3.6207	1.1244	1	5
KSUPay	K-State estimate of 2014 county payment for ARC-CO per acre	5.2353	13.6236	0	63.9257
HighPay	Binary variable equal to 1 if expected payment from preferred program was higher after meeting	.0945	.2928	0	1
LowPay	Binary variable equal to 1 if expected payment from preferred program was lower after meeting	.2968	.4572	0	1

Table 4. Soybeans Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Information Sources	Categorical variables denoting sources of information on the Farm Bill				
InPerson	Binary variable equal to 1 if source is in-person meetings	.7807	.4142	0	1
Online	Binary variable equal to 1 if source is online materials	.2457	.4309	0	1
PrintNews	Binary variable equal to 1 if source is newspaper or magazine	.5425	.4987	0	1
RadioTV	Binary variable equal to 1 if source is radio or television	.2042	.4035	0	1
OtherProd	Binary variable equal to 1 if source is other producers	.5690	.4957	0	1
OtherSource	Binary variable equal to 1 if source is from other outlets	.1267	.3329	0	1
Industry Membership	Categorical variables denoting membership in various groups				
KFB	Binary variable equal to 1 if member of Kansas Farm Bureau	.5992	.4905	0	1
AFB	Binary variable equal to 1 if member of American Farm Bureau	.0643	.2455	0	1
KSCommodity	Binary variable equal to 1 if member of a Kansas commodity group	.2212	.4154	0	1
FU	Binary variable equal to 1 if member of Farmers Union	.0378	.1909	0	1
OtherMember	Binary variable equal to 1 if member of other organization	.0756	.2646	0	1
Risk Protection	Categorical variables indicating the program with best risk protection				
PLCRisk	Binary variable equal to 1 if selected PLC	.3441	.4755	0	1
DkRisk	Binary variable equal to 1 if selected “Don’t Know”	.1521	.3595	0	1
Highest Payout	Categorical variables indicating the program with highest annual payout				
PLCPay	Binary variable equal to 1 if selected PLC	.1374	.3446	0	1
DkPay	Binary variable equal to 1 if selected “Don’t Know”	.25	.4334	0	1

Table 4. Soybeans Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Updating Base Acreage	Categorical variables indicating preference for updating base acreage				
BaseNo	Binary variable equal to 1 if selected "No"	.0832	.2764	0	1
BaseDk	Binary variable equal to 1 if selected “Don’t Know”	.3129	.4641	0	1
Split	Binary variable equal to 1 if farm resides in a county designated by FSA as eligible for split irrigated and non-irrigated payments	.0775	.2676	0	1

Observations: 529

Table 5. Grain Sorghum Individual ARC Enrollment Summary Statistics

Variable	Definition	Mean	Std. Dev.	Min	Max
Dependent Variable					
ARC-CO	Binary variable equal to 1 if ARC-CO was preferred program after education	.3272	.4694	0	1
Explanatory Variables					
Days	Number of days prior to enrollment deadline educational meeting was attended	70.2890	10.1569	53	85
Title	Binary variable equal to 1 if respondent identified as a producer	.3589	.4800	0	1
Experience	Number of years involved in production agriculture	28.5822	15.1229	0	70
Income	Percentage of income derived from agriculture	73.8777	28.1193	0	100
OwnAcres	Number of agricultural acres owned	1024.425	1967.708	0	35,000
RentAcres	Number of agricultural acres rented	1465.812	2253.781	0	31,000
ACRE2009	Binary variable equal to 1 if respondent enrolled in ACRE program during previous Farm Bill	.1904	.3929	0	1

Table 5. Grain Sorghum Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Coverage	Percentage of crop insurance coverage carried on grain sorghum acres	33.7507	35.9828	0	85
RiskAttitude	Likert scale response to statement: "I accept more risk in my farming business than other crop producers."	3.6131	1.1024	1	5
KSUPay	K-State estimate of 2014 county payment for ARC-CO per acre	11.0469	15.7316	0	52.53
HighPay	Binary variable equal to 1 if expected payment from preferred program was higher after attending educational meeting	.1082	.3109	0	1
LowPay	Binary variable equal to 1 if expected payment from preferred program was lower after attending educational meeting	.2671	.4428	0	1
Information Sources	Categorical variables denoting sources of information on the Farm Bill				
InPerson	Binary variable equal to 1 if source is in-person meetings	.7452	.4360	0	1
Online	Binary variable equal to 1 if source is online materials	.2397	.4272	0	1
PrintNews	Binary variable equal to 1 if source is newspaper or magazine	.5603	.4967	0	1
RadioTV	Binary variable equal to 1 if source is radio or television	.1986	.3992	0	1
OtherProd	Binary variable equal to 1 if source is other producers	.5986	.4905	0	1
OtherSource	Binary variable equal to 1 if source is from other outlets	.1288	.3352	0	1

Table 5. Grain Sorghum Individual ARC Enrollment Summary Statistics, cont.

Variable	Definition	Mean	Std. Dev.	Min	Max
Industry Membership	Categorical variables denoting membership in various groups				
AFB	Binary variable equal to 1 if member of American Farm Bureau	.0521	.2223	0	1
KSCommodity	Binary variable equal to 1 if member of a Kansas commodity group	.2014	.4013	0	1
FU	Binary variable equal to 1 if member of Farmers Union	.0301	.1712	0	1
OtherMember	Binary variable equal to 1 if member of other organization	.0521	.2223	0	1
Risk Protection	Categorical variables indicating the program with best risk protection				
PLCRisk	Binary variable equal to 1 if selected PLC	.3384	.4735	0	1
DkRisk	Binary variable equal to 1 if selected “Don’t Know”	.1754	.3806	0	1
Highest Payout	Categorical variables indicating the program with highest annual payout				
PLCPay	Binary variable equal to 1 if selected PLC	.1915	.3937	0	1
DkPay	Binary variable equal to 1 if selected “Don’t Know”	.3017	.4593	0	1
Updating Base Acreage	Categorical variables indicating preference for updating base acreage				
BaseNo	Binary variable equal to 1 if selected "No"	.1076	.3101	0	1
BaseDk	Binary variable equal to 1 if selected “Don’t Know”	.3056	.4610	0	1
Split	Binary variable equal to 1 if farm resides in a county designated by FSA as eligible for split irrigated and non-irrigated payments	.0198	.1372	0	1

Observations: 730

Results

Twelve variables were identified to significantly alter ARC enrollment for Kansas wheat producers, as shown in table 6. *Days, Coverage, KSCommodity, LowPay,* and *KSUPay* all

positively impacted selection of ARC. *LowPay* had the largest marginal effect—increasing ARC enrollment by 6.9% if a producer's payment expectations were higher after attending educational meetings. This result is significant at a 5% level. Membership in a commodity organization (*KSCommodity)* increased ARC selection by 6.8% at a 10% significance level. *Days, Coverage,* and *KSUPay* all had minimal positive marginal effects on ARC enrollment at 0.2%, 0.1%, and 0.8%, respectively. Factors negatively impacting ARC selection included *Experience, AFB, PLCRisk, DkRisk, PLCPay, DkPay,* and *BaseDk. PLCRisk* and *DkRisk* had large marginal impacts of 21.4% and 20.1% with both results being significant at a 1% level. Additionally, *PLCPay* and *DkPay* decreased enrollment at a rate of 39.6% and 13.5%, respectively. These results were also significant at the 1% level.

There are several potential causes for these results. As PLC was the default program and all established producers would have had familiarity with a price based option, producers' preferences could have been biased towards PLC. Additionally, given producer's risk aversion, a more familiar (and less complicated) program could have had more appeal than one that was unfamiliar and complex. At a 5% significance level, membership in the American Farm Bureau as well as uncertainty of updating base acreage reduced the likelihood of enrolling in ARC by 12.2% and 6.1%. Lastly, increased farm experience negatively impacted ARC enrollment by a modest 0.2%. One potential cause of experience reducing a producer's preference could come from the possibility that more experienced producers have experienced very low commodity prices such as during the 1980s. To a producer that had seen extreme decline in crop prices, the potential for prices to decline again would make a price based program much more appealing given its catastrophic payout ability.

Table 6. Wheat Logit Model Results

Variable	Coefficient	Std. Err.	Marginal Effect	P Value
Dependent Variable: ARC-CO				
Days	0.014	0.008	0.002	0.09
Title	0.161	0.191	0.026	0.40
Experience	-0.01	0.006	-0.002	0.10
Income	1.20E-03	3.30E-03	0.000	0.70
OwnAcres	-3.80E-04	4.20E-04	0.000	0.37
RentAcres	-5.80E-05	3.90E-04	0.000	0.14
ACRE2009	-0.289	0.219	-0.047	0.19
Coverage	6.00E-03	2.00E-03	0.001	0.02
RiskAttitude	9.00E-03	0.074	0.001	0.90
InPerson	0.007	0.202	0.001	0.97
Online	0.188	0.212	0.031	0.38
PrintNews	0.071	0.189	0.012	0.71
RadioTV	0.058	0.225	0.009	0.80
OtherProd	-0.159	0.184	-0.026	0.39
OtherSource	0.232	0.256	0.038	0.37
KFB	0.13	0.179	0.021	0.47
AFB	-0.744	0.373	-0.122	0.05
KSCommodity	0.416	0.229	0.068	0.07
FU	0.32	0.486	0.052	0.51
OtherMember	0.022	0.357	0.004	0.95
HighPay	-0.083	0.275	-0.014	0.76
LowPay	0.423	0.208	0.069	0.04
KSUPay	0.047	0.009	0.008	< 0.000
PLCRisk	-1.254	0.2	-0.214	< 0.000
DkRisk	-1.186	0.248	-0.201	< 0.000
PLCPay	-2.091	0.242	-0.396	< 0.000
DkPay	-0.8	0.215	-0.135	< 0.000
BaseNo	-0.439	0.287	-0.073	0.13
BaseDk	-0.371	0.191	-0.061	0.05
Split	0.366	0.341	0.06	0.28
Constant	0.367	0.751		0.78
Pseudo R^2	0.2136			
Number of Obs.	874			

Table 7 displays the results of the corn model. Factors positively impacting enrollment in ARC for corn producers include *Title, Income, Coverage, Online, RadioTV, OtherMember*, and *KSUPay*. The largest positive, marginal change came from the variable *OtherMember* (14.8%) and was significant at a 5% level. Information sources including *Online* and *RadioTV* increased

enrollment by 9.7% and 10.5%, respectively. If a survey respondent identified as a producer increased ARC enrollment by 7.9% at a 1% significance level. Variables increasing enrollment by less than 1% included *Income, Coverage,* and *KSUPay.* As seen in the wheat results, *PLCRisk, DkRisk, PLCPay, DkPay,* and *BaseDk* all negatively impacted ARC enrollment. The impact of these variables ranged from 6.3% (*BaseDk)* to 26.8% (*PLCPay).* Additionally, *RiskAttitude* reduced the likelihood of enrolling in ARC by 2.3%, supporting the notion that a producer's risk preferences factored into their expectations of payment and risk protection for ARC and PLC. *Experience* also had similar impacts on corn enrollment in ARC: increased experience levels reduced likelihood of selecting ARC by 0.2%. The *Split* categorical variable also proved statistically significant and reduced ARC selection by 5.3%. This is unsurprising given the larger number of counties designated as split for corn and soybeans than for that of wheat and grain sorghum. This result was significant at a 10% level.

Table 7. Corn Logit Model Results

Variable	Coefficient	Std. Err.	Marginal Effect	P Value
Dependent Variable: ARC-CO				
Days	-0.005	0.009	-0.001	0.57
Title	0.459	0.174	0.079	0.01
Experience	-0.013	0.006	-0.002	0.02
Income	0.009	3.00E-03	0.002	0.01
OwnAcres	8.20E-05	6.20E-05	0.000	0.19
RentAcres	1.07E-05	4.70E-05	0.000	0.82
ACRE2009	-0.155	0.215	-0.027	0.47
Coverage	2.50E-02	3.00E-03	0.004	< 0.000
RiskAttitude	-0.131	0.074	-0.023	0.08
InPerson	0.209	0.194	0.036	0.28
Online	0.561	0.213	0.097	0.01
PrintNews	-0.082	0.183	-0.014	0.65
RadioTV	0.61	0.219	0.105	0.01
OtherProd	-0.017	0.179	-0.003	0.93
OtherSource	0.127	0.246	0.022	0.61
KFB	0.13	0.173	0.023	0.45
AFB	-0.426	0.396	-0.074	0.28
KSCommodity	0.115	0.219	0.020	0.60

Table 7. Corn Logit Model Results, cont.

Variable	Coefficient	Std. Err.	Marginal Effect	P Value
FU	0.696	0.453	0.120	0.12
OtherMember	0.855	0.362	0.148	0.02
HighPay	-0.178	0.268	-0.031	0.51
LowPay	0.219	0.198	0.038	0.27
KSUPay	0.005	0.003	0.001	0.09
PLCRisk	-0.621	0.196	-0.109	0.002
DkRisk	-0.668	0.247	-0.117	0.01
PLCPay	-1.493	0.253	-0.268	< 0.000
DkPay	-0.597	0.205	-0.109	0.004
BaseNo	0.055	0.278	0.010	0.84
BaseDk	-0.36	0.189	-0.063	0.06
Split	-0.304	0.183	-0.053	0.10
Constant	1.24	0.758		0.87
Pseudo R^2	0.2494			
Number of Obs.	874			

The results of the soybean model are displayed in table 8. *Income, Coverage, InPerson, Online, OtherMember,* and *LowPay* represented factors positively impacting ARC enrollment for soybeans. While *Income* and *Coverage* had minimal impacts of less than 1%, information sources of *InPerson* and *Online* increased ARC selection by 5.3% and 7.6%. Other significant marginal effects included *OtherMember* (18.9%) and *LowPay* (8.7%)—both of which were significant at a 1% level. *DkRisk, PLCPay, DkPay*, and *Split* followed similar effects shown in ARC selection for corn. Marginal effects were determined to decrease ARC enrollment by 11.2% for *DkRisk,* 26% for *PLCPay,* 13.3% for *DkPay,* and 14.1% for *Split.* All of these results were found to be significant at a 1% level. Unlike corn and wheat, not updating base acreage (*BaseNo)* was found to be significant as opposed to *BaseDk.* It caused a 9.8% decline in likelihood of choosing ARC.

Table 8. Soybean Logit Model Results

Variable	Coefficient	Std. Err.	Marginal Effect	P Value
Dependent Variable: ARC-CO				
Days	0.011	0.009	0.002	0.22
Title	0.192	0.177	0.030	0.28
Experience	-0.006	0.006	-0.001	0.31
Income	0.010	0.003	0.002	0.003
OwnAcres	-5.03E-05	0.0000459	0.000	0.273
RentAcres	-1.07E-04	0.0000484	0.000	0.027
ACRE2009	-0.103	0.224	-0.016	0.645
Coverage	0.031	0.003	0.005	< 0.000
RiskAttitude	-0.111	0.077	-0.017	0.15
InPerson	0.335	0.206	0.053	0.10
Online	0.483	0.217	0.076	0.03
PrintNews	0.181	0.192	0.028	0.35
RadioTV	0.100	0.227	0.016	0.66
OtherProd	-0.132	0.189	-0.021	0.49
OtherSource	-0.315	0.263	-0.050	0.23
KFB	-0.161	0.182	-0.025	0.38
AFB	-0.381	0.410	-0.060	0.35
KSCommodity	0.199	0.223	0.031	0.37
FU	0.589	0.475	0.093	0.22
OtherMember	1.196	0.374	0.189	0.001
HighPay	-0.405	0.275	-0.064	0.14
LowPay	0.551	0.207	0.087	0.01
KSUPay	0.003	0.006	0.000	0.67
PLCRisk	-0.218	0.203	-0.035	0.28
DkRisk	-0.718	0.272	-0.112	0.01
PLCPay	-1.628	0.276	-0.260	< 0.000
DkPay	-0.781	0.217	-0.133	< 0.000
BaseNo	-0.627	0.301	-0.098	0.04
BaseDk	-0.244	0.200	-0.039	0.22
Split	-0.953	0.270	-0.141	< 0.000
Constant	-1.225	0.816		0.13
Pseudo R^2	0.2989			
Number of Obs.	874			

Results of the grain sorghum model, shown in table 9, indicate the fewest significant factors impacting ARC enrollment. *Days* and *Coverage* increased ARC selection by less than 1% each with both at a 5% significance level. *Title, OtherProd, PLCRisk, DkRisk,* and *PLCPay* negatively affected enrollment. At a 10% significance level, *OtherProd* caused a marginal

decline of 5.4%. Substantial decreases were caused by *Title (*11.6%), *PLCRisk* (19.4%), *DkRisk (*17.6%), and *PLCPay (*19%). These results were significant at the 1% level.

Table 9. Grain Sorghum Logit Model Results

Variable	Coefficient	Std. Err.	Marginal Effect	P Value
Dependent Variable: ARC-CO				
Days	0.016	0.008	0.003	0.05
Title	-0.590	0.164	-0.116	< 0.000
Experience	-0.004	0.005	-0.001	0.41
Income	-0.001	0.003	0.000	0.78
OwnAcres	-2.03E-05	4.10E-05	0.000	0.62
RentAcres	-2.35E-05	0.0000378	0.000	0.53
ACRE2009	0.041	0.197	0.008	0.84
Coverage	0.004	0.002	0.001	0.05
RiskAttitude	0.003	0.069	0.001	0.96
InPerson	-0.042	0.184	-0.008	0.82
Online	0.076	0.194	0.015	0.70
PrintNews	0.133	0.173	0.026	0.44
RadioTV	0.058	0.199	0.012	0.77
OtherProd	-0.277	0.169	-0.054	0.10
OtherSource	-0.366	0.234	-0.072	0.12
KFB	-0.175	0.162	-0.034	0.28
AFB	0.338	0.344	0.066	0.33
KSCommodity	0.233	0.199	0.046	0.24
FU	-0.145	0.447	-0.029	0.75
OtherMember	0.260	0.323	0.051	0.42
HighPay	-0.139	0.248	-0.027	0.57
LowPay	0.064	0.186	0.130	0.73
KSUPay	0.004	0.005	0.001	0.42
PLCRisk	-0.959	0.187	-0.194	< 0.000
DkRisk	-0.852	0.237	-0.176	< 0.000
PLCPay	-1.054	0.261	-0.190	< 0.000
DkPay	-0.167	0.193	-0.035	0.39
BaseNo	-0.103	0.263	-0.020	0.70
BaseDk	-0.241	0.180	-0.047	0.18
Split	0.550	0.532	0.108	0.30
Constant	-0.674	0.710		0.34
Pseudo R^2	0.093			
Number of Obs.	874			

Policy Implications and Conclusion

The results of both the aggregate and individual analyses across all four crops indicate the many different considerations that producers weighed when selecting a farm safety net program. Additionally, given the different pricing, yield, and production possibilities across commodities, it is difficult to give an aggregate response for enrollment factors of Kansas producers that grew multiple crops. While these results yielded statistically significant program selection factors, the limited scope of survey analysis certainly did not capture all enrollment considerations. Additionally as noted by Mitchell (2012), the survey was only capable of capturing producers' enrollment intentions given the possibility that new information or changes in preference could alter their enrollment choice before the sign-up deadline.

Interpreting the results of this analysis and potential impacts of 2014 Farm Bill program design requires understanding the geopolitical and farm financial climate leading up to the program sign-up. Prior to the deadline, producers had seen some of the highest net farm returns in their lifetimes. As a result, they had yet to feel the full effects of the declining farm economy that began in 2014. Significant considerations taken by future legislative efforts should take care to consider producer experience, risk preferences and both past and future commodity market scenarios when designing farm policy. Whereas recent farm policy design has taken a more retroactive development approach, future legislators should take care to also assess what the future may hold for the production agriculture industry.

As producers were only allowed to make a one-time program selection over the life of the bill, extensive planning was required on their part to fully assess the possible scenarios facing their operation given different commodity price and yield combinations. The incomplete information dilemma that faced producers hindered their ability to most effectively select a

program that would best protect them over the five year life of the legislation.[2] As a result, producers were forced to rely on past experiences, information provided from third party sources (such as commodity organizations), or make their decision at random. The complex design of ARC also gave producers incentive to consider a more easily understood alternative in PLC. Given the drastic change in program options from 2002-2014 as well as the complexity of the ARC program, legislators should consider utilizing as many working aspects of ARC and PLC as possible. Adjustments should be made where necessary in order to best benefit the largest number of producers based on the desired congressional goals of the legislation. This would allow producers to become familiar with the intricacies of the program and best be able to judge if it provides the greatest risk protection for their individual operation as opposed to only understanding its effects at an aggregate level.

While this analysis does provide insight into how a producer in Kansas might have selected a farm safety net, it leaves many more questions than answers. Understanding why a specific enrollment factor was of particular significance to a producer can be challenging. It is important that moving forward, the design of farm policy takes into consideration individual characteristics of producers, their operations, and their risk preferences. Given the different scopes of PLC and ARC (catastrophic versus shallow coverage), legislators should also seek to identify what goals they hope to accomplish in the design of farm policy. Should programs maximize payments to producers or limit them in order to reduce federal outlays? Should special care be given to design programs that disproportionately benefit less experienced producers over

[2] Given the transaction costs associated with offering the producers the ability to re-enroll in a program, a compromise should be found to strike a balance between administrative costs of enrolling producers in FSA programs while reducing deadweight loss accrued by producers as a result of incomplete information.

more experienced? Additionally, given the results of this research, should lawmakers consider directives that provide additional funding for educational efforts in order for producers to make an informed program choice?

Although not within the scope of this research, other potential considerations should be taken to assess the effectiveness of these programs in conjunction with Federal Crop Insurance also provided under the Farm Bill. Other research opportunities by which to inform the legislative process include completing the cross comparison and logit models for other Kansas crops in addition to major crops in other states that utilized similar extension surveys. Additionally, this opportunity could be expanded to represent a multivariate approach capable of identifying switching patterns across respondents. For producers initially stating a preference for ARC but indicating PLC as their program of choice in the post survey, what factors contributed to the decision to change program choice? This process could be repeated for producers intending to enroll in PLC but selecting ARC, as well as for identifying what factors contributed to a respondent maintaining their initial choice. This process would strengthen what is currently known about extension efforts to educate about farm policy as well as deepen the understanding for how expectations and beliefs weigh into a program selection.

Regardless of the results of this research, what is clear is that the U.S. agricultural economy is currently in a precarious state. Moving forward given the uncertainty surrounding commodity markets, it is imperative that future farm legislation have an effective design by which to protect producers from downside risk. The two programs offered by the 2014 Farm Bill offered flexible options in order for producers to select a program that fit their risk preferences and production scheme. However, given the five year commitment of the enrollment choice, producers were faced with a scenario in which little information was available for them to make

an informed decision. Additionally, given the complexity of the ARC program as well as the option to update base acreages and yields, producers were overwhelmed with choices.

These results suggest that expectations such as what program a producer felt would pay more or offer better risk protection weighed heavily into their selection decision. Other relevant factors included updating base acreage as well as if a county offered split irrigated and non-irrigated payments for crops that had a larger number of split county designations. Risk attitudes factored heavily into a producer's intended program choice although it should be noted that stated producer program preference is not always the program in which they enroll in as noted by Mitchell (2012). Other factors affecting enrollment preferences included information sources that producers utilized to educate them about their options in addition to affiliations with agricultural organizations such as a commodity group.

As previously stated, a one-time enrollment decision over a five year program left producers with much uncertainty surrounding which program would offer the best protection for their operation. Differing expectations across producers for how various protection programs should function (i.e. minimize losses or maximizing payments) led to a variety of factors affecting enrollment at the individual level. Further complicating producers' decisions included understanding how updating base acreage and yields would affect their program choice. Limited information available concerning commodity yields and prices in the later years of the legislation forced producers to rely on estimates and expectations for years 2017 and 2018. This situation could prove challenging if the farm economy is in a drastically different state between 2014 and 2018. A program selection that functioned effectively for a producer in 2014 might not provide the desired safety net in 2018 if substantial changes occur in commodity markets, weather, etc.

The results of this research also suggest that legislators should consider producers' expectations and preferences when designing farm policy. Additionally, they should take care to not have a one-dimensional approach to policy design—both a retroactive and forward looking approach should be utilized in order to develop the most efficient safety net programs that also meet the intended outcomes of the legislation. Producers' payment and risk preferences as well as their outlook for the agricultural sector are founded in their experiences and information available to them. As such, legislators should offer programs that allow producers the opportunity to fully assess the impacts of their enrollment choice and select a program that meets their specific needs for farm policy. In order for this to occur, farm legislation should consider what aspects of previous farm bills worked/didn't work, what the current state of the farm economy looks like as well as what considerations should be made when writing the legislation, as well as what the farm economy might look like in future years of the life of a farm bill.

Understanding the factors affecting Farm Bill program selection at the individual level is a complex task. Recognizing the diverse needs and expectations of producers is the first step in designing farm policy that benefits the greatest number of producers. By providing both a revenue and price based program, the 2014 Farm Bill offered producers the choice between catastrophic and shallow risk coverage based on their risk preferences and expectations of the future farm economy. Moving forward, farm safety net programs should continue to evolve to meet the current and future market possibilities in order to best protect American producers.

References

Barnett, B.J. and K.H. Coble. 2011. "Understanding Regional Differences in Farm Policy Preferences." *American Journal of Agricultural Economics* 94(2): 528-534.

Chavas, J.P. and M.T. Holt. 1996. "Economic Behavior Under Uncertainty: A Joint Analysis of Risk Preferences and Technology." *The MIT Press* 78(2): 329-335.

Coble, K. and R. Dismukes. 2008. "Distributional and Risk Reduction Effects of Commodity Revenue Program Design." *Review of Agricultural Economics*. 30(3) 543-553.

Cole, S. and B. Kirwan. 2009. "Between the Corporation and the Household: Commodity Prices, Risk Management, and Agricultural Production in the United States." *American Journal of Agricultural Economics.* 91(5): 1243-1249.

Durst, R. and R. Williams. 2016. *Farm Bill Income Cap for Program Eligibility Affects Few Farms*. Washington D.C.: U.S. Department of Agriculture, ERS, August.

Edwards, W.M. 2011. "Why was ACRE a NO-GO with Iowa Farmers?" *Choices.* 4th Quarter.

Floros, J. 2016. "Agriculture Leads: Kansas State University's College of Agriculture continues to help sustain the university and state's largest industry." Kansas State University Research and Extension News. 12 April. https://www.ksre.k-state.edu/news/news-stories/2016-news-releases/april/agriculture-leads041216.html.

Mitchell, P.D., R.M. Rejesus, K.H. Coble, and T. O. Knight. 2012. "Analyzing Participation Intentions and County Enrollment Rates for the Average Crop Revenue Election Program." *Applied Economic Perspectives and Policy.* 34(4): 615-636.

Offutt, S. 2002. "The Future of Farm Policy Analysis: A Household Perspective." *American Journal of Agricultural Economics.* 84(5):1189-1200.

Orden, D., and C. Zulauf. 2015. Political Economy of the 2014 Farm Bill. Paper presented at ASSA annual meetings, January.

Plastina, A. and C. Hart. 2014. "Price Expectations and Risk Profiles Drive Commodity Program Choices." *Agricultural Policy Review.* Issue 3.

Rejesus, R.M. 2013. "Participation in the Average Crop Revenue Election Program (ACRE): *Lessons for the Next Farm Bill*." College of Agriculture and Life Sciences, North Carolina State University.

Schnepf, R. 2015. *2014 Farm Bill Provisions and WTO Compliance.* Washington D.C.: U.S. Congressional Research Service Report No. 43817, April.

U.S. Congress, Congressional Budget Office. 2014. *CBO's March 2016 Baseline for Farm Programs.* Washington D.C., 24 March.

U.S. Congress, Congressional Budget Office. 2014. *H.R. 2642, Agricultural Act of 2014 Cost Estimate*. Washington D.C., 28 January.

U.S. Department of Agriculture. 2009. *Average Crop Revenue Election (ACRE) Program Backgrounder*. FSA. Washington D.C., April.

U.S. Department of Agriculture. 2014. *Introduction to STAX for Producers of Upland Cotton*. RMA. Washington D.C., August.

U.S. Department of Agriculture. 2014. *Projected Spending Under the 2014 Farm Bill.* ERS. Washington D.C., January.

U.S. Department of Agriculture. 2015. 2013 National ACRE Sign-Ups. Raw Data. FSA. Washington D.C.

U.S. Department of Agriculture. 2015. 2009/10-2014/15 Market Year Average (MYA) Prices. FSA. Washington D.C., March.

U.S. Department of Agriculture. 2015. *2014 – 2018 Crop Year Appendix to CCC-861, Price Loss Coverage (PLC) and Agriculture Risk Coverage with County Option (ARC-CO) Program Contract and CCC-862, Agriculture Risk Coverage with Individual Option (ARC-IC) Program Contract*. CCC. Washington D.C., June.

U.S. Department of Agriculture. 2015. *USDA Extends ARC and PLC Deadlines.* FSA News Release No. 0076.15. Washington D.C., October.

U.S. Department of Agriculture. 2016. *2014 Farm Bill Fact Sheet.* FSA. Washington D.C., October.

U.S. Department of Agriculture. 2016. *USDA Issues Safety-Net Payments to Farmers in Response to 2015 Market Downturn*. FSA News Release No. 0214.16. Washington D.C., October.

Weber, M. 1987. "Decision making with incomplete information." *European Journal of Operational Research.* (28)1: 44-57.

Wyant, S. 2013. "Cochran selected as Senate Agriculture Committee ranking member." *Agri-Pulse*. January.

Woolverton, A., and E. Young. 2009. *Factors Influencing ACRE Program Enrollment.* Washington D.C.: U.S. Department of Agriculture, ERS Rep. 84, December.

Zulauf, C. and D. Orden. 2014. "The US Agricultural Act of 2014." International Food Policy Research Institute Discussion Paper 01393. December.