

# Crops Marketing and Management Update

## Grains and Forage Center of Excellence

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### Topic 1. February 9<sup>th</sup> WASDE Update: USDA Provides a Surprise for Wheat

Most February WASDE reports have few surprises that trigger moves in the futures market. The February report focuses on any change in demand projections and an updated forecast of South American corn and soybean production. The market is already looking past the February WASDE in anticipation of the March 31<sup>st</sup> *Prospective Plantings* report, and the first projections of 2017 planted corn and soybean area.

Table 1. U.S. Corn Supply and Use						Table 2. U.S. Soybean Supply and Use					
	2013-14	2014-15	2015-16 Estimated	2016-17 Projected	Change from 15-16		2013-14	2014-15	2015-16 Estimated	2016-17 Projected	Change from 15-16
Planted Area (million)	95.4	90.6	88.0	94.0	+6.0	Planted Area (million)	76.8	83.3	82.7	83.4	+0.7
Harvested Area (million)	87.5	83.1	80.8	86.0	+5.2	Harvested Area (million)	76.3	82.6	81.7	82.7	+1.0
Yield (bushels/acre)	158.1	171	168.4	174.6	+6.2	Yield (bushels/acre)	44	47.5	48.0	52.1	+4.1
----- Million Bushels -----						----- Million Bushels -----					
Beginning Stocks	821	1,232	1,731	1,737	+6	Beginning Stocks	141	92	191	197	+6
Production	13,829	14,216	13,602	15,148	+1,546	Production	3,358	3,927	3,926	4,307	+381
Imports	36	32	67	55	-12	Imports	72	33	24	25	+1
Total Supply	14,686	15,479	15,401	16,940	+1,539	Total Supply	3,570	4,052	4,140	4,528	+388
Feed and Residual	5,040	5,323	5,131	5,600	+469	Crushings	1,734	1,873	1,886	1,930	+44
Food, Seed & Industrial	6,493	6,560	6,635	6,795	+160	Exports	1,638	1,843	1,936	2,050	+114
Ethanol and by-products	5,124	5,200	5,206	5,350	+144	Seed	97	96	97	95	-2
Exports	1,920	1,864	1,898	2,225	+327	Residual	10	49	24	33	+9
Total Use	13,454	13,748	13,664	14,620	+956	Total Use	3,478	3,862	3,944	4,108	+164
Ending Stocks	1,232	1,731	1,737	2,320	+583	Ending Stocks	92	191	197	420	+223
Stocks/Use	9.2%	12.6%	12.7%	15.9%	+3.2%	Stocks/Use	2.6%	4.9%	5.0%	10.2%	+5.2%
Days of Stocks	33	46	46	58	+12	Days of Stocks	10	18	18	37	+19.1
U.S. Marketing-Year Average Price (\$/bu)	\$4.46	\$3.70	\$3.61	\$3.40	-\$0.21	U.S. Marketing-Year Average Price (\$/bu)	\$13.00	\$10.10	\$8.95	\$9.50	+\$0.55

The February report increased ethanol use by 25 million bushels and other industrial use by 10 million bushels with ending stocks reduced by that sum (Table 1). Corn ending stocks are slightly larger than 2.3 billion bushels with stocks-use at 15.9% suggesting a sufficient cushion in corn stocks. USDA did not make any adjustments in the soybean

supply and use projections from January (Table 2). Projected soybean ending stocks have more than doubled from last year. However, the soybean market benefits from strong use especially in the export market supporting a higher marketing-year average (MYA) price.

	2013-14	2014-15	2015-16 Estimated	2016-17 Projected	Change from 15-16
Planted Acres (million)	56.2	56.8	55.0	50.2	-4.8
Harvested Acres (million)	45.3	46.4	47.3	43.9	-3.4
Yield (bushels/acre)	47.1	43.7	43.6	52.6	+9.0
----- Million Bushels -----					
Beginning Stocks	718	590	752	976	+224
Production	2,135	2,026	2,062	2,310	+248
Imports	173	149	113	125	+12
Total Supply	3,026	2,766	2,927	3,410	+483
Food	955	958	957	960	+3
Seed	77	79	67	61	-6
Feed and Residual	228	122	152	225	+73
Exports	1,176	854	775	1,025	+250
Total Use	2,436	2,014	1,952	2,271	+319
Ending Stocks	590	752	976	1,139	+163
Stocks/Use	24.2%	37.3%	50.0%	50.2%	+0.2%
Days of Stocks	88	136	183	183	+1
U.S. Marketing-Year Average Price (\$/bu)	\$6.87	\$5.99	\$4.89	\$3.85	-\$1.04

Source: February 2017 WASDE - USDA, WAOB.

The corn and soybean market fundamentals often overshadow any market news for wheat. The surprise in the February report was in the wheat market. The January *Winter Wheat Seeding* report buoyed the wheat market by projecting reduced winter wheat seeding for 2017. The February *WASDE* projected an increase in exports to 1.025 million bushels. Wheat stocks are still burdensome with a stocks-use ratio greater than 50%. The increase in use was more than expected and was a bullish fundamental. Another bullish fundamental is the Southern Plains drought area that may reduce the hard red winter wheat crop. Concerns that unusually warm weather may break dormancy early may also eventually provide winterkill if there is a late winter cold spell.

## Topic 2. Potential 2017 RP Insurance Corn and Soybean Guarantees and Safety-Net Decisions

February is when the projected price for Revenue Protection (RP) crop insurance is established based on the December 2017 corn and November 2017 soybeans futures contracts closing prices for this month. While the projected price will not be set until March 1, the current average prices can measure the potential risk protection provided by crop insurance for 2017. The revenue guarantee provided by RP insurance for varying coverage levels are compared to the budgeted cost of production and the cost of production plus cash rent to analyze the risk protection.

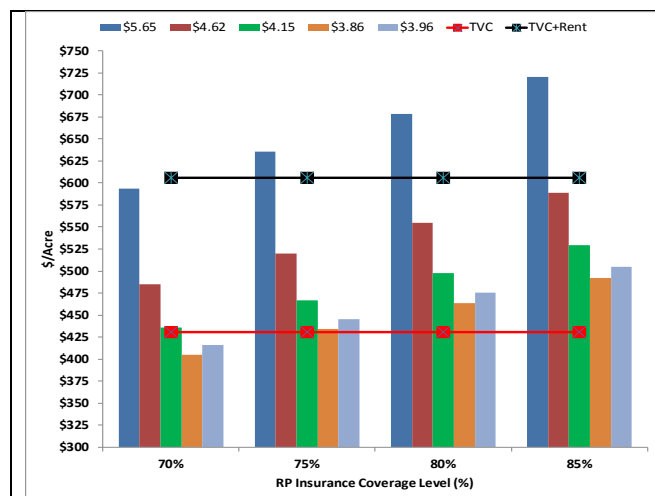


Figure 1. 2017 and Previous Years Corn Revenue Guarantee (\$/Acre) Compared to Total Variable Costs (Red line) and Total Variable Costs plus Rent (Black Line) at a 150 bushel/Acre APH Yield.

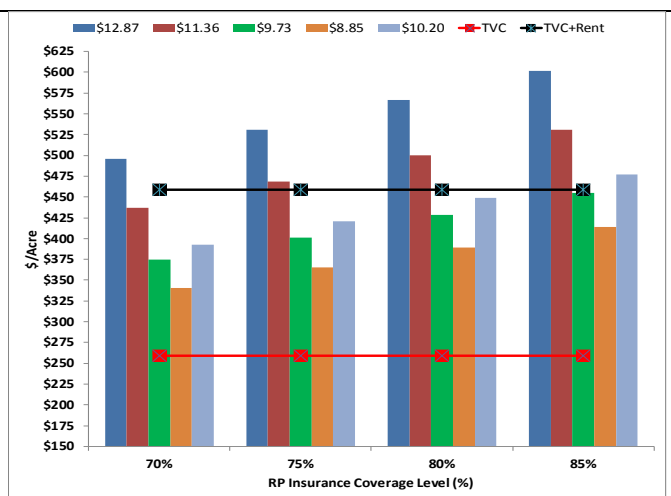


Figure 2. 2017 and Previous Years Soybean Revenue Guarantee (\$/Acre) Compared to Total Variable Costs (Red line) and Total Variable Costs plus Rent (Black Line) at a 50 bushel/Acre APH Yield.

The rainbow of colored columns in Figure 1 and Figure 2 represent the RP insurance revenue guarantees provided for the 2013 (dark blue), 2014 (dark red), 2015 (green), 2016 (orange), and 2017 (purple) crop years. The multi-year comparison illustrates how the crop insurance safety net has declined over the last five years as ending stocks for corn and soybeans have rebuilt after the 2012 drought. The red line is the 2017 budgeted per acre input costs, and the black line is the input costs plus budgeted cash rent. The corn and soybean APH yields are 150 and 50 bushels/acre, respectively, for Figure 1 and Figure 2.

With the price discovery period halfway completed, the projected corn price for corn and soybeans are estimated at \$3.96 and \$10.20 per bushel, respectively. A projected price for corn at \$3.96 would only be a \$0.10/bushel increase over last year's price and would be \$1.69 per bushel below the guarantee in 2013 (Figure 1). Figure 1 shows that the 2013 coverage may have been sufficient to provide a revenue guarantee that covered per acre input costs and cash rent, which is not the case this year. If the \$3.96 price is realized, the budgeted safety net would be \$12/acre greater than the 2016 guarantee at the 80% coverage level (Figure 1).

Figure 2 demonstrates the potential for an improved revenue safety net for soybeans in 2017. The current projected price for soybeans is \$10.20/bushel, which would be a \$1.35/bushel increase over the 2016 price (Figure 2). The 2017 projected soybean price would be \$2.67/bushel lower than the 2013 insurance guarantee. Figure 2 suggests that a revenue safety net that covers total inputs and cash rent might be available at the 85% coverage level depending on the APH yield, cost of the insurance, and the farm's cost structure. At the 80% coverage level, the 2017 revenue guarantee is \$59/acre larger than last year (Figure 2).

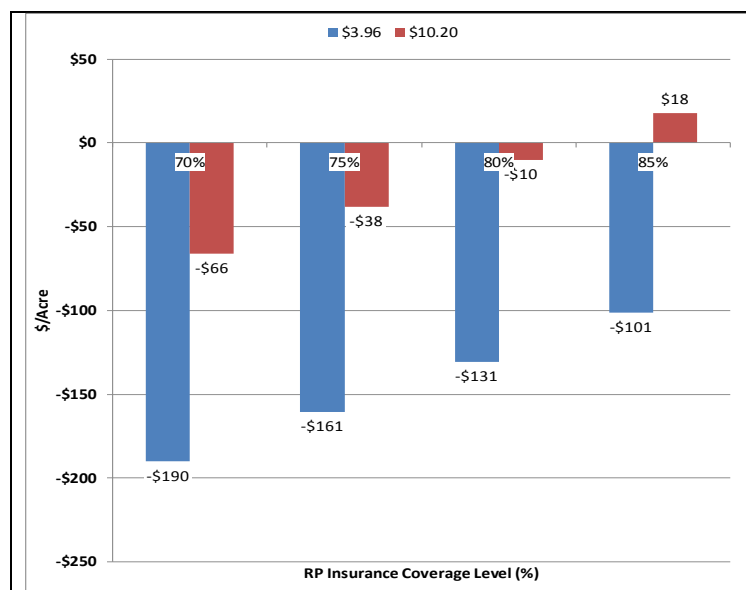


Figure 3. 2017 Corn (blue) and Soybean (red) RP Revenue Guarantee Compared to Total Variable Costs Plus Cash Rent for Various Coverage Levels.

Figure 3 provides another reason why soybean planted area is expected to increase in Western Kentucky. The revenue guarantee for corn (blue) is \$131/acre less than the Total Variable Costs plus Cash Rent at the 80% coverage level. At the highest coverage level, the deficit is projected to be over \$100/acre.

The soybean revenue safety net is projected to potentially provide a return over TVC and rent at the 85% coverage level. While few farmers have historically purchased the 85% level, the 80% coverage may limit the loss to \$10/acre.

Soybeans may have a much better RP safety net in 2017 and managers should work with their insurance agent to understand the potential revenue protection benefits versus the cost of increasing coverage for soybeans (Figure 3).

### Topic 3. Corn and Soybean Storage Risk Management Alternatives for May Delivery

Let us look at the alternatives available to manage price risk if storing corn and soybeans to May 2017. Table 4 illustrates the effectiveness of a cash forward contract (CFC), hedging with futures, or purchasing a put option to create a price floor in protecting positive returns over 2016 input costs, cash rent, and storage from harvest to May 2017. Table 4 provides a range of harvested 2016 corn yields reflecting the challenges of profitably pricing stored corn if there was a production loss. Notice how the per bushel cost of inputs, land rent, and storage from October 2016 to May 17 is \$0.66/bushel lower for the farm harvesting 180-bushel corn as compared to the farm harvesting 150-bushel corn. As always, managers are strongly encouraged to use their firm's cost and production information in making this, and all other, marketing risk management decision (Table 4).

Table 4 is an elaborate way to illustrate that the corn market is not providing opportunities to use price risk tools to lock in a profitable return to 2016 input costs, land rent, and storage for most cost structures. The potential of being profitable is for the farm harvesting 170-bushel corn as the firm's per bushel costs are low enough to lock in a return of \$0.20/bushel through hedging with futures or hedge to arrive (HTA) contracts. Otherwise, the risk products are not able to protect a profitable return at lower yields and higher costs (Table 4).

Table 5 is also an elegant way to illustrate that the soybean market continues to provide risk management opportunities for stored 2016 soybeans. The potential to lock in profits above inputs, land, and storage is available for those farms with 2016 soybean yields at 50 bushels/acre or greater. The largest returns are with hedging or an HTA

contract with slightly lower returns by using CFC to lock in a cash price. For those managers wanting to maintain the flexibility of benefiting from higher prices from now until May, the put option may be able to establish a price floor at profitable levels. If the July 2017 soybean contract rallies from now until May, there is a potential to obtain even higher prices above the floor protected by the put option. In this example, the put establishes a price floor at \$10.33/bushel, which could lock in a return of \$1.06/bushel for a 50-bushel yield to over \$2.50/bushel for a 60-bushel yield (Table 5).

Table 4. Western Kentucky Risk Management Opportunities for Corn Storage until May 2017 for Various Cost Structures.

Storage Hedge: May 2017	Corn			
	150	160	170	180
Yield				
TVC+Rent (\$/acre)	\$599	\$599	\$599	\$599
TVC+Rent+\$0.26 storage (\$/bu)	\$4.25	\$4.00	\$3.78	\$3.59
CFC @ \$3.86	-\$0.39	-\$0.14	+\$0.08	+\$0.28
Hedge @ \$3.93 +\$0.06 basis = \$3.99	-\$0.27	-\$0.02	+\$0.20	+\$0.40
Put: \$3.90 strike @\$0.20 = \$3.76 floor	-\$0.49	-\$0.24	-\$0.02	+\$0.17
Strategies Evaluated on:	February 15, 2017			

Table 5. Western Kentucky Risk Management Opportunities for Soybean Storage until May 2017 for Various Cost Structures.

Storage Hedge: May 2017	Soybeans			
	40	50	60	70
Yield				
TVC+Rent (\$/acre)	\$441	\$441	\$441	\$441
TVC+Rent+\$0.45 storage (\$/bu)	\$11.48	\$9.27	\$7.80	\$6.75
CFC @ \$10.52	-\$0.96	+\$1.25	+\$2.72	+\$3.77
Hedge @ \$10.80 + \$0.02 basis = \$10.82	-\$0.66	+\$1.55	+\$3.02	+\$4.07
Put: \$10.80 strike @\$0.491 = \$10.33 floor	-\$1.15	+\$1.06	+\$2.53	+\$3.58
Strategies Evaluated on:	February 15, 2017			

#### Topic 4. Projected Returns to On-Farm and Off-Farm Storage for Corn and Soybeans

Tables 6 to 9 show the projected returns over storage, shrink and opportunity costs for both on-farm and off-farm storage for corn and soybeans. These tables may help guide the timing of marketing grain in storage. The historical basis for locations in Western Kentucky from 2001 to 2015 is used with current futures market quotes to develop price expectations for each month from November 2016 to July 2016. The Kentucky Farm Bureau Federation provides this updated basis information. The mechanics of how these returns are calculated can be found in the November 2015 newsletter posted online at the Agricultural Economics website (the URL is listed in Topic 8).

Table 6 provides the projected returns to on-farm storage for corn. Remember that the returns in Table 6 for the cash-forward-contract price (CFC) have the most certainty as the CFC guarantees a selling price with certainty by a contract. The rest of the returns in Table 6 are subject to futures market and basis volatility.

On February 15, the CFC bids show the returns in February to be \$0.02/bushel larger than for March (Table 6). The CFC bids also suggest an opportunity in early summer (May and June) for those willing to protect those returns through contract. Managers need to have low-cost storage and managerial skills to keep grain in quality condition in warm and humid weather. The average basis strengthens into late spring, which has historically provided larger returns to storage. The risk of bids declining in late spring and early summer remains as South America reenters the export market. This export competition will pressure old crop corn prices, as there is potential for an increase in 2016-17 ending stocks from the current projections if old-crop exports decline.

**Table 6. Projected Returns to On-Farm Storage for Corn from October 2016 to July 2017<sup>1/</sup>**

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July
<b>Expected Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.382	+\$0.401	+\$0.416	+\$0.485	+\$0.498	+\$0.571
<b>Median Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.359	+\$0.370	+\$0.391	+\$0.435	+\$0.471	+\$0.472
<b>CFC (DTN)</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.346	+\$0.325	+\$0.349	+\$0.360	+\$0.374	+\$0.287
<b>10th Percentile Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.281	+\$0.279	+\$0.325	+\$0.333	+\$0.349	+\$0.292
<b>25th Percentile Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.312	+\$0.304	+\$0.362	+\$0.411	+\$0.413	+\$0.351
<b>75th Percentile Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.445	+\$0.469	+\$0.466	+\$0.542	+\$0.547	+\$0.638
<b>90th Percentile Basis</b>	<b>-\$0.003</b>	+\$0.089	+\$0.244	+\$0.497	+\$0.555	+\$0.548	+\$0.734	+\$0.728	+\$0.888

<sup>1/</sup> Cash market data for Western Kentucky locations are used to calculate daily basis for the nearby futures contract from 2001 to 2015. The monthly average basis are used with current futures prices to forecast cash market prices for November 2016 to July 2017. The expected basis is the average each month for the 15 years. The median basis is the 50th percentile or the middle of the distribution of the monthly average basis. CFC (DTN) is cash-forward-contract prices as reported on DTN for Western Kentucky locations. The 10th, 25th, 75th and 90th percentiles are the basis level where 10%, 25%, 75% and 90% of the basis are at or below those levels, respectively. The 10th percentile basis represents a very wide basis while the 90th percentile represents a very narrow basis level. The only forecast which is certain is the CFC (DTN) as those are contracted prices. The rest are subject to market risk and basis volatility.

Returns to Storage Evaluated on: February 15, 2017

The returns to storage include the opportunity cost of not selling corn at harvest. This example assumes a 5% annual interest rate opportunity cost. Farms highly leveraged with higher interest rates also have larger opportunity costs.

Table 7 presents the projected returns to off-farm corn storage, which tell a similar story like that of on-farm storage. The challenge with off-farm storage is the larger storage fees budgeted in this example. This analysis assumes a flat storage fee from harvest until January 31 with a \$0.04/bushel monthly charge starting in February. The CFC bids suggest the return in February is greater than March with traditional basis appreciation providing the potential for larger returns in May and June for those willing to lock in these returns with a CFC.

**Table 7. Projected Returns to Off-Farm Storage for Corn from October 2016 to July 2017<sup>1/</sup>**

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July
<b>Expected Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.082	+\$0.104	+\$0.122	+\$0.195	+\$0.211	+\$0.287
<b>Median Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.059	+\$0.073	+\$0.097	+\$0.145	+\$0.184	+\$0.189
<b>CFC (DTN)</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.046	+\$0.029	+\$0.055	+\$0.070	+\$0.086	+\$0.003
<b>10th Percentile Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	<b>-\$0.019</b>	<b>-\$0.017</b>	+\$0.032	+\$0.043	+\$0.062	+\$0.008
<b>25th Percentile Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.012	+\$0.007	+\$0.068	+\$0.120	+\$0.126	+\$0.068
<b>75th Percentile Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.145	+\$0.173	+\$0.172	+\$0.252	+\$0.259	+\$0.354
<b>90th Percentile Basis</b>	<b>-\$0.312</b>	<b>-\$0.218</b>	<b>-\$0.059</b>	+\$0.197	+\$0.258	+\$0.255	+\$0.444	+\$0.440	+\$0.605

<sup>1/</sup> Cash market data for Western Kentucky locations are used to calculate daily basis for the nearby futures contract from 2001 to 2015. The monthly average basis are used with current futures prices to forecast cash market prices for November 2016 to July 2017. The expected basis is the average each month for the 15 years. The median basis is the 50th percentile or the middle of the distribution of the monthly average basis. CFC (DTN) is cash-forward-contract prices as reported on DTN for Western Kentucky locations. The 10th, 25th, 75th and 90th percentiles are the basis level where 10%, 25%, 75% and 90% of the basis are at or below those levels, respectively. The 10th percentile basis represents a very wide basis while the 90th percentile represents a very narrow basis level. The only forecast which is certain is the CFC (DTN) as those are contracted prices. The rest are subject to market risk and basis volatility.

Returns to Storage Evaluated on: February 15, 2017

There is a lot more red ink for the projected returns to off-farm storage. Previous analysis has shown more red ink for all of the basis expectations. The positive returns in February signal that managers should consider selling the off-farm stored corn. Those waiting for the average basis appreciation into May and June should examine how risk management may protect profitable returns to storage.

Table 8 provides the projected returns to on-farm storage for soybeans. When this was written, the soybean futures market complex closed higher improving carry in the futures market and providing a more positive story regarding the economics returns to storage. The CFC bids suggest that February may provide a \$0.407 return to storage with another pricing opportunity potentially in April. The concern with storing until May is that South American exports might pressure old-crop soybean prices lower as U.S. exports slow. The CFC bids on February 15 are projecting economic returns to be lower after April (Table 8).

**Table 8. Projected Returns to On-Farm Storage for Soybeans from October 2016 to July 2017<sup>1/</sup>**

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July
<b>Expected Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.655	+\$0.631	+\$0.601	+\$0.696	+\$0.644	+\$0.845
<b>Median Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.667	+\$0.643	+\$0.611	+\$0.684	+\$0.676	+\$0.648
<b>CFC (DTN)</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.407	+\$0.369	+\$0.429	+\$0.403	+\$0.333	
<b>10th Percentile Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.466	+\$0.394	+\$0.396	+\$0.376	+\$0.329	+\$0.070
<b>25th Percentile Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.605	+\$0.549	+\$0.535	+\$0.604	+\$0.583	+\$0.316
<b>75th Percentile Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.735	+\$0.750	+\$0.669	+\$0.831	+\$0.774	+\$1.397
<b>90th Percentile Basis</b>	<b>-\$0.105</b>	+\$0.150	+\$0.186	+\$0.787	+\$0.822	+\$0.760	+\$0.886	+\$0.829	+\$1.848

<sup>1/</sup> Cash market data for Western Kentucky locations are used to calculate daily basis for the nearby futures contract from 2001 to 2015. The monthly average basis are used with current futures prices to forecast cash market prices for November 2016 to July 2017. The expected basis is the average each month for the 15 years. The median basis is the 50th percentile or the middle of the distribution of the monthly average basis. CFC (DTN) is cash-forward-contract prices as reported on DTN for Western Kentucky locations. The 10th, 25th, 75th and 90th percentiles are the basis level where 10%, 25%, 75% and 90% of the basis are at or below those levels, respectively. The 10th percentile basis represents a very wide basis while the 90th percentile represents a very narrow basis level. The only forecast which is certain is the CFC (DTN) as those are contracted prices. The rest are subject to market risk and basis volatility.

Returns to Storage Evaluated on: February 15, 2017

The returns to off-farm soybean storage (Table 9) has more black ink than in previous months reflecting the overall rally in the soybean market when the returns were projected. Using CFC bids, February and April provide the largest guaranteed returns to storage. The concern of lower prices if storing past April is also reflected in Table 9.

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July
Expected Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.430	+\$0.407	+\$0.377	+\$0.471	+\$0.420	+\$0.620
Median Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.443	+\$0.419	+\$0.387	+\$0.460	+\$0.452	+\$0.423
CFC (DTN)	-\$0.329	-\$0.074	-\$0.038	+\$0.183	+\$0.145	+\$0.205	+\$0.179	+\$0.109	
10th Percentile Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.242	+\$0.170	+\$0.171	+\$0.152	+\$0.105	-\$0.154
25th Percentile Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.380	+\$0.325	+\$0.311	+\$0.380	+\$0.359	+\$0.091
75th Percentile Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.511	+\$0.526	+\$0.445	+\$0.607	+\$0.550	+\$1.173
90th Percentile Basis	-\$0.329	-\$0.074	-\$0.038	+\$0.563	+\$0.598	+\$0.536	+\$0.662	+\$0.605	+\$1.623

<sup>1/</sup> Cash market data for Western Kentucky locations are used to calculate daily basis for the nearby futures contract from 2001 to 2015. The monthly average basis are used with current futures prices to forecast cash market prices for November 2016 to July 2017. The expected basis is the average each month for the 15 years. The median basis is the 50th percentile or the middle of the distribution of the monthly average basis. CFC (DTN) is cash-forward-contract prices as reported on DTN for Western Kentucky locations. The 10th, 25th, 75th and 90th percentiles are the basis level where 10%, 25%, 75% and 90% of the basis are at or below those levels, respectively. The 10th percentile basis represents a very wide basis while the 90th percentile represents a very narrow basis level. The only forecast which is certain is the CFC (DTN) as those are contracted prices. The rest are subject to market risk and basis volatility.

Returns to Storage Evaluated on: February 15, 2017

These tables are to remind managers that grain storage is a valuable tool to add value to the crop. If possible, managers should consider sales based on the best return instead of sales dictated solely by cash flow demands. These examples also reinforce the need for managers to know their storage costs to be able to determine the projected return from an additional month of storage expense. Use the market signals and cost information to guide marketing decisions.

## Topic 5. 2017 Corn, Soybean and Wheat Risk Management Opportunities

A topic repeatedly discussed in these newsletters is that sometimes the best pricing opportunities occur while the seed is still in the bag. Tables 10-12 analyze the effectiveness of CFC, hedging with futures, or put options in protecting revenue that covers total input costs plus cash rent for corn, soybeans, and wheat.

Table 10 presents risk management alternatives for Western Kentucky corn production for 2017. Several yield projections are provided to show what yield is needed to find profitable pricing opportunities. Three risk management alternatives are compared. A cash-forward-contract at \$3.84/bushel is based on DTN bids for Western Kentucky locations. The second marketing alternative is to hedge with commodity futures, or HTA contracts, that would lock in an expected cash price at \$3.93/bushel assuming a -\$0.10/bushel harvest-time basis. The third alternative is to establish a price floor at \$3.59/bushel by buying a put option with a \$4 strike price that costs \$0.307.

Table 10 reminds managers that the corn market continues to lack risk management opportunities for the 2017 crop unless the farm routinely harvests corn yields greater than 170 bushels, as hedging with futures may lock in a positive return over input costs and rent of \$0.17/bushel.

	<u>130</u>	<u>140</u>	<u>150</u>	<u>160</u>	<u>170</u>	<u>180</u>
Yield						
TVC+Rent (\$/acre)	\$639	\$639	\$639	\$639	\$639	\$639
TVC+Rent (\$/bu)	\$4.92	\$4.56	\$4.26	\$3.99	\$3.76	\$3.55
CFC @ \$3.84	-\$1.07	-\$0.72	-\$0.42	-\$0.15	+\$0.09	+\$0.29
Hedge @ \$4.03 + -\$0.10 basis = \$3.93	-\$0.99	-\$0.64	-\$0.33	-\$0.07	+\$0.17	+\$0.38
Put: \$4.00 strike @ \$0.307 = \$3.59 floor	-\$1.32	-\$0.97	-\$0.67	-\$0.40	-\$0.17	+\$0.04
Strategies Evaluated on:	February 15, 2017					

Those farms that routinely produce 180-bushel corn may be able to lock-in a profit above input costs and cash rent. Farms with lower expected yields do not have profitable risk management opportunities at current prices (Table 10).

Table 11 illustrates the potential of using risk management products to lock in a profitable return on input costs and cash rent for 2017 soybeans if managers routinely obtain yields greater than 50 bushels/acre.

Table 11. Risk Management Alternatives for 2017 Western Kentucky Soybeans for Various Yield Objectives.					
Yield	30	40	50	60	70
TVC+Rent (\$/acre)	\$486	\$486	\$486	\$486	\$486
TVC+Rent (\$/bu)	\$16.20	\$12.15	\$9.72	\$8.10	\$6.94
CFC @ \$10.08	-\$6.12	-\$2.07	+\$0.36	+\$1.98	+\$3.14
Hedge @ \$10.34 + -\$0.10 basis = \$10.24	-\$5.96	-\$1.91	+\$0.52	+\$2.14	+\$3.30
Put: \$10.40 strike @\$0.692 = \$9.61 floor	-\$6.59	-\$2.54	-\$0.11	+\$1.51	+\$2.67
Strategies Evaluated on:	February 15, 2017				

The largest projected returns are from using hedging with CFC providing a lower return. Those managers seeking to place a floor on price may be able to lock in a minimum return more than \$1.50/bushel protected with put options at 60-bushel yields (Table 11).

It should be no surprise that the wheat market currently is not offering profitable risk management opportunities unless the farm average yield has been 80-bushel wheat or larger (Table 12). The wheat example assumes that double-crop soybeans are also produced, so the pricing target only covers all wheat input costs and 50% of land costs. Managers that routinely produce large yields may be able to use risk management to protect returns (Table 12).

Table 12. Risk Management Alternatives for 2017 Western Kentucky Wheat for Various Yield Objectives.					
Yield	50	60	70	80	90
TVC+50% Rent (\$/acre)	\$371	\$371	\$371	\$371	\$371
TVC+Rent (\$/bu)	\$7.42	\$6.18	\$5.30	\$4.64	\$4.12
CFC @ \$4.65	-\$2.77	-\$1.53	-\$0.65	+\$0.01	+\$0.53
Hedge @ \$4.80 - \$0.10 basis = \$4.70	-\$2.72	-\$1.48	-\$0.60	+\$0.06	+\$0.58
Put: \$4.80 strike @\$0.284 = \$4.42 floor	-\$3.00	-\$1.77	-\$0.88	-\$0.22	+\$0.29
Strategies Evaluated on:	February 15, 2017				

Those managers that routinely yield 90-bushel wheat may be able to lock in a profitable return through CFC or hedging. Those with lower yields will rely on the double-crop soybeans to provide the potential for this enterprise to be profitable (Table 12).

## Topic 6. Preliminary Risk Management Game Plans for 2017 Corn and Soybeans

Last month's newsletter provided an initial risk management game plan for 2017 corn and soybeans. This month will provide an update on the progress in implementing the risk plans and any revised marketing goals.

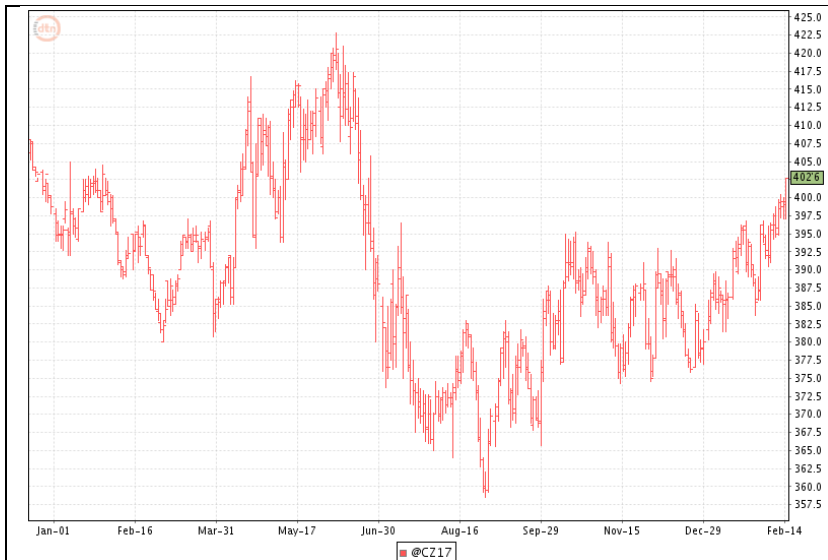


Figure 4. December 2017 Corn Futures Contract Chart (as of February 15, 2017)

The December 2017 corn futures contract has been trading in a sideways market since October 2016. The market has been trending higher since January 13, with repeated attempts to break through the \$4 resistance. The DEC contract broke through \$4 on February 15 closing at \$4.02 3/4. Resistance is at \$4.05 and again at \$4.11-\$4.12. Support would be at the \$3.90 level and again at \$3.80 if the corn market were to move lower. The next support before the basement would be in the \$3.70 neighborhood. If the DEC contract could break through the \$4.05 and \$4.10 resistance levels, the psychology of a more bullish market may provide opportunities to implement the risk management plan at the higher target objectives.

What might break corn out of this sideways trading? A weather event in the Midwest or key Southern Hemisphere production regions may provide this opportunity. If the *Prospective Plantings* report shows a larger than expected reduction in corn area, the DEC 2017 corn contract may push higher and provide some pricing opportunities.

Table 13 presents an updated risk management plan for 2017 corn. The foundation of the plan is crop insurance. The projected price is assumed at \$3.96/bushel with the actual crop insurance price known at the end of February. The example farm has an assumed APH corn yield of 175 bushels/acre, and the plan assumes an 80% coverage level. The revenue protection provided through RP insurance is \$554/acre, which is \$90/acre greater than the projected input costs.

Table 13 defines the pricing objectives, bushels priced, and date priced as part of the pre-harvest risk plan. The DEC 2017 contract closed at 4.02 ¼ on Feb 15. The plan revises the other pricing objectives higher in anticipation of pre-planting report fundamental news that may push prices swiftly above \$4.15 /bushel. A movement above \$4.15 will be noteworthy as the DEC 17 corn futures has been trading sideways and a lurch higher may be a sign of the potential for greater movement. The revised objectives and percentage of expected production priced are \$4.15 (10%), \$4.40 (15%), and \$4.65 (15%). This plan prices 50% of expected priced before harvest at an average price \$4.35/bushel (Table 13). The pricing tools used are either CFC prices, or hedge-to-arrive (HTA) contracts net of fees.

Table 13. 2017 Corn Risk Management Game Plan as of February 15, 2017.

Expected Corn Production (bushels/acre)		175
Date Priced	Priced Realized	Bushels Priced
2/15/17	\$4.02	17.5
Revised Objective	\$4.15	17.5
Revised Objective	\$4.40	26.25
Revised Objective	\$4.65	26.25
Bushels Priced		87.5
Average Price		\$4.35

The first objective was met on February 15 as the DEC contract closed above the \$4 target (green shade). Given the current futures market fundamentals, the \$4.40 and \$4.65 opportunities may only be priced due to a weather event or a surprise from USDA in 2017 projections. Managers should have a plan in place to capture these opportunities after reflecting on what fundamentals caused the corn market to breakout to such higher trading levels (Table 13).

Note: RP Insurance at the 80% coverage level will be purchased. This assumes an APH yield of 175 bu/acre and a Projected Price of \$3.96/bu. The expected revenue protection is \$554/acre which is \$90/acre greater than the budgeted corn production cost. The RP insurance protection will protect 140 bushels/acre to be forward contracted or contracted with Hedge-to-Arrive contracts (HTA). This is a conservative strategy on the quantity priced. There is some hope involved that the corn market can break higher to these prices. The market has traded sideways and a break through \$4 DEC 2017 resistance may provide pricing opportunities through HTA contracts.

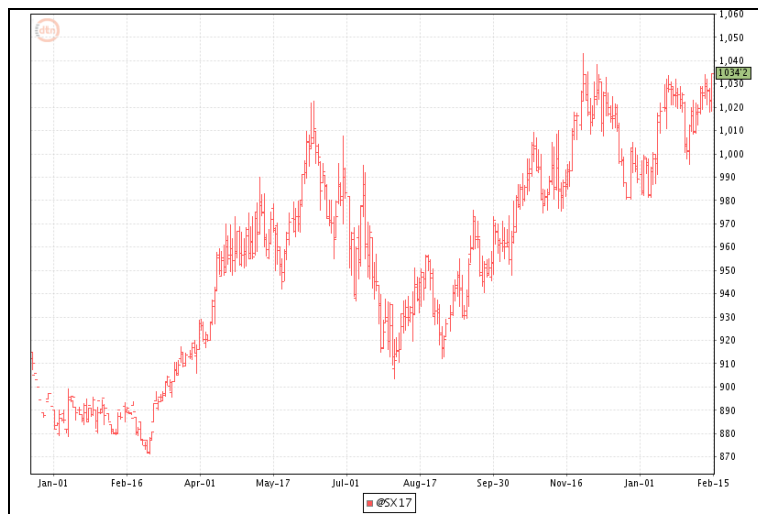


Figure 5. November 2017 Soybean Futures Contract Chart (as of February 15, 2017)

The November 2017 soybean chart illustrates the upward trend since the 2016 soybean harvest. The November 2017 contract has been trading in a sideways pattern since November 2016 with support from the \$9.80 range and resistance at the \$10.30 price level.

The overall concern in the 2017 soybean market is the potential of a larger than expected acreage increase and beneficial weather building stocks and pushing price lower. If the November 2017 contract breaks through the \$9.80 support, there is room to fall lower with support levels perhaps at \$9.50 and \$9.30 based on the chart pattern and previous lows. Managers should have expectations of the futures contract moving lower barring a weather event that provides fundamental support for higher prices.

The soybean risk plan in Table 14 assumes RP insurance at the 80% coverage level is purchased assuming an APH yield of 55 bushels/acre and a projected price of \$10.20/bushel. Insurance would provide an initial revenue guarantee of \$449/acre, which is \$137/acre greater than the budgeted soybean production costs. RP insurance will guarantee 44 bushels/acre. The proposed pricing plan is aggressive given the concern of limited upside potential needing the insurance guarantee of 44 bushels/acre (Table 14).



Table 14. 2017 Soybean Risk Management Game Plan as of February 15, 2017.

Expected Soybean Production (bushels/acre)		55
Date Priced	Priced Realized	Bushels Priced
2/1/17	\$10.12	5.5
2/8/17	\$10.28	5.5
Revised Objective	\$10.70	13.75
Revised Objective	\$10.95	19.25
Bushels Priced		44
Average Price		\$10.68

The NOV 2017 soybean futures contract closed at 10.12 on Feb 1 and 10.28 on Feb 8 (green shade). Given how quickly the first two pricing objectives were met, the remaining objectives are revised in anticipation of potentially higher price movement than originally planned. The \$10.50 objective is revised to \$10.70, and the \$10.75 objective is revised to \$10.95. The \$10.70 objective would price 25% of expected production, and the \$10.95 objective would price 35% of expected production (Table 14).

Note: RP Insurance at the 80% coverage level will be purchased. This assumes an APH yield of 55 bu/acre and a Projected Price of \$10.20/bu. The expected revenue protection is \$449/acre which is \$137/acre greater than the budgeted soybean production cost. The RP insurance protection will protect 44 bushels/acre to be forward contracted or contracted with Hedge-to-Arrive contracts (HTA). This is an aggressive strategy reflecting a belief that the soybean market faces limited upside potential unless there is a strong change in fundamentals.

If the soybean risk plan is achieved, the average pre-harvest price will be \$10.68 on 80% of expected production. The November 2017 soybean contract closed at \$10.34 <sup>1</sup>/<sub>4</sub> on February 15, 2017, which is \$0.35 <sup>3</sup>/<sub>4</sub> below the \$10.70 price objective and \$0.60 <sup>3</sup>/<sub>4</sub> below the \$10.95 price objective (Table 14).

These risk management plans are provided to illustrate that marketing and crop insurance should be used together to price bushels before harvest when profitable opportunities arise. Notice that this plan is not trying to capture the highest possible price. The design of this plan is to reduce risk and to avoid a near fatal blow to the firm's revenue that creates liquidity and solvency problems.

This exercise is also to help managers start thinking about what they might do to take advantage of pricing opportunities that are available before harvest. The market will react to fundamentals, primarily weather, that could push prices temporarily higher to a profitable pricing point. Having a plan will help guide risk management without being swept up by the emotion of the market and giddiness of the potential for even higher than expected prices.

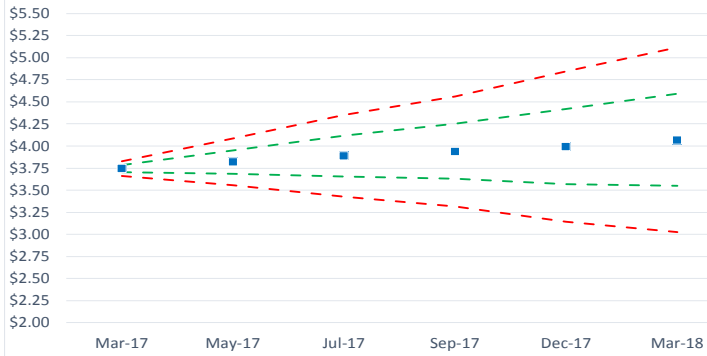
## Topic 7. Projected Corn, Soybean, and Wheat Futures Trading Ranges to March 2018

Marketing and risk management would be much easier if there were a tool that could help quantify the probability of meeting a pricing objective. Understanding the probabilistic trading ranges based on current futures market volatility will help managers gauge the likelihood of reaching their pricing objectives. Figures 6 – 8 provide the projected futures price trading range, by futures contract month, based on the contracts' actual volatility for the previous 21-day period. The green lines represent the range that describes the 68% probability of the projected trading range with the red line representing 95% likelihood of the projected trading range. Notice how these projections fan out for the contracts that will expire later this year or early in 2018. That is because there is more time until expiration; thus, there is a wider potential trading range for these deferred futures contracts.

Figure 6 provides the probabilistic trading range for the corn futures contracts from March 2017 to March 2018. There is a 68% probability that the December 2017 corn contract will trade between \$3.57 and \$4.42 and a 95% probability that the December 2017 corn contract will trade between \$3.14 and \$4.84 (Figure 6). Looking at the potential to hedge stored corn from the 2017 harvest, the 68% trading range for the March 2018 corn contract is \$3.53 to \$4.68 (Figure 6).

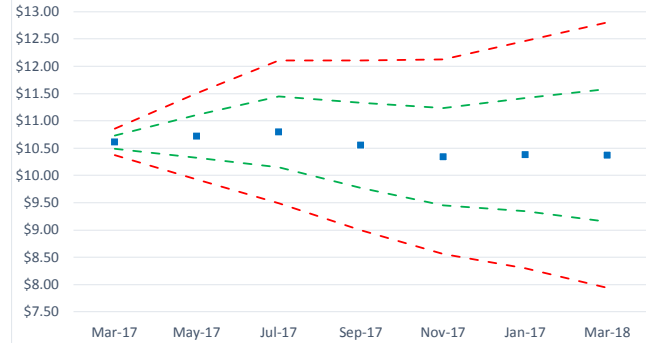
Figure 7 provides the probabilistic trading range for soybean futures contracts from March 2017 to March 2018. The November 2018 soybean futures have a 68% probability of trading between \$9.45 to \$11.24 with a 95% likelihood of trading between \$8.56 and \$12.13 (Figure 7). For hedging stored 2017 soybeans, the March 2018 soybean contract has a 68% probability trading range of \$9.15 to \$11.59 (Figure 7).

**Figure 6. Corn Futures Closing Price on February 15, 2017, with 68% Probability (Green) and 95% Probability (Red) Trading Range**



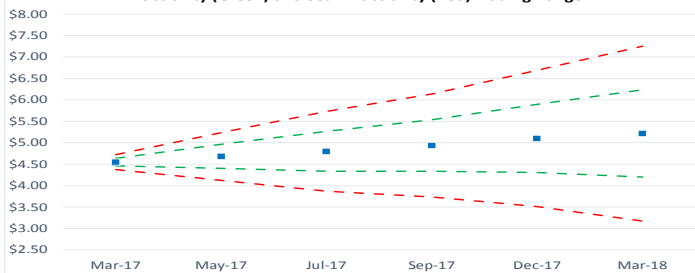
Trading range calculated on February 15, 2017, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 15, 2017, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

**Figure 7. Soybean Futures Closing Price on February 15, 2017, with 68% Probability (Green) and 95% Probability (Red) Trading Range**



Trading range calculated on February 15, 2017, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 15, 2017, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

**Figure 8. Wheat Futures Closing Price on February 15, 2017, with 68% Probability (Green) and 95% Probability (Red) Trading Range**






Trading range calculated on February 15, 2017, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 15, 2017, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 8 provides the probabilistic trading range for wheat futures contract from March 2017 to March 2018 contracts. The July 2017 futures contract has a 68% probability of trading between \$4.33 to \$5.54 (Figure 8). The 95% probability trading range is \$3.87 to \$5.73 (Figure 8). Managers considering hedging 2017 wheat may want to pull the trigger if the July 2017 approaches \$5.25/bushel, which is within the 68% probability trading range. Drought in the Southern Plains may push July wheat to this pricing objective.

### Topic 8. How Do I Get on the Email Distribution List to Receive this Newsletter?

If you would like to receive each month's newsletter by email, send an email to [todd.davis@uky.edu](mailto:todd.davis@uky.edu) and request to be added to the email distribution list. The *Crops Marketing and Management Update* is published monthly usually after the release of the USDA: WASDE report. You can find this issue and past issue on the UK Agricultural Economics Department's website at <http://www.uky.edu/Ag/AgEcon/extcmmu.php>

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