

Crops Marketing and Management Update

Grains and Forage Center of Excellence

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Topic 1. June WASDE Report Responds to Record Late Corn Planting Progress

This topic's title is an understatement of what the World Agricultural Outlook Board published for June's updated 2019 Corn Supply and Demand balance sheet. Market analysts surveyed before the report expected USDA to reduce the 2019 corn ending stocks from the May estimate of 2.48 billion bushels to about 1.7 billion bushels. Analysts expected a significant reduction in planted area to drive the decline in stocks. The surprise in the report was USDA reducing the 2019 yield by 10 bushels/acre from the May estimate of 176 bushels to the June estimate of 166 bushels. USDA typically trims yield incrementally, so the 10-bushel change in one month was noteworthy.

USDA provided minor adjustments to the old-crop corn balance sheet by reducing exports by 100 million bushels from the May report. The result is a 100 million bushel increase in 2018-19 corn ending stocks to 2.19 billion bushels (Table 1). USDA projects the U.S. marketing year average (MYA) farm price for 2018-19 at \$3.60 per bushel, an increase of \$0.10/bushel from the May report.

USDA slashed the 2019 corn crop by 1.35 billion bushels from the initial estimates in May. USDA reduced planted and harvested area by 3 million acres due to the historically slow planting progress (to be discussed further in Topic 4). The 10-bushel reduction in the estimated yield is starting a debate on the timing and size of future yield adjustments before the in-field surveys are initiated in August. Total corn supply is projected at 15.9 billion bushels, a reduction of 1.23 billion bushels from the May estimate. If realized, the supply of U.S. corn would be 670 million bushels less than last year's supply (Table 1).

USDA adjusted feed and residual use lower by 300 million bushels in response to the reduction in the size of the corn crop. Since the residual component reflects the quantity used not directly measured, the quantity of residual demand increases and decreases in conjunction with the size of the U.S. corn crop. USDA also trimmed export demand by 125 million bushels to reflect competition in the export market.

Table 1. U.S. Corn Supply and Use.

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Area (million)	94.0	90.2	89.1	89.8	+0.7
Harvested Area (million)	86.7	82.7	81.7	82.4	+0.7
Yield (bushels/acre)	174.6	176.6	176.4	166.0	-10.4
----- Million Bushels -----					
Beginning Stocks	1,737	2,293	2,140	2,195	+55
Production	15,148	14,609	14,420	13,680	-740
Imports	<u>57</u>	<u>36</u>	<u>35</u>	<u>50</u>	+15
Total Supply	16,942	16,939	16,595	15,925	-670
Feed and Residual	5,472	5,304	5,300	5,150	-150
Food, Seed & Industrial	6,883	7,056	6,900	6,950	+50
Ethanol and by-products	5,432	5,605	5,450	5,500	+50
Exports	<u>2,293</u>	<u>2,438</u>	<u>2,200</u>	<u>2,150</u>	-50
Total Use	14,649	14,799	14,400	14,250	-150
Ending Stocks	2,293	2,140	2,195	1,675	-520
Stocks/Use	15.7%	14.5%	15.2%	11.8%	-3.5%
Days of Stocks	57	53	56	43	-13
U.S. Marketing-Year Average Price (\$/bu)	\$3.36	\$3.36	\$3.60	\$3.80	+\$0.20

Source: June 2019 WASDE - USDA: WAOB.

The net effect of the changes to supply and use is that corn ending stocks were reduced by 810 million bushels from the May report to a projected 1.67 billion bushels. The days of corn stocks fell from a projected 62-days of corn from the May projections to 43-days of corn available projected in the June report.

USDA increased the U.S. marketing year average (MYA) farm price by \$0.50/bushel from the May report to \$3.80/bushel.

Many analysts expect the planted area and yield projections to decline in future reports due to farmers taking prevented planting insurance payments. Any factor that reduces production will provide further support for higher prices.

Table 2. U.S. Soybeans Supply and Use.

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Area (million)	83.4	90.2	89.2	84.6	-4.6
Harvested Area (million)	82.7	89.5	88.1	83.8	-4.3
Yield (bushels/acre)	52	49.3	51.6	49.5	-2.1
----- Million Bushels -----					
Beginning Stocks	197	302	438	1,070	+632
Production	4,296	4,412	4,544	4,150	-394
Imports	<u>22</u>	<u>22</u>	<u>17</u>	<u>20</u>	+3
Total Supply	4,515	4,735	4,999	5,240	+241
Crushings	1,901	2,055	2,100	2,115	+15
Exports	2,174	2,129	1,700	1,950	+250
Seed	105	104	98	96	-2
Residual	<u>34</u>	<u>9</u>	<u>31</u>	<u>34</u>	+3
Total Use	4,213	4,297	3,929	4,195	+266
Ending Stocks	302	438	1070	1045	-25
Stocks/Use	7.2%	10.2%	27.2%	24.9%	-2.3%
Days of Stocks	26	37	99	91	-8.5
U.S. Marketing-Year Average Price (\$/bu)	\$9.47	\$9.33	\$8.50	\$8.25	-\$0.25

Source: June 2019 WASDE - USDA: WAOB.

The June report provided minor adjustments to the old-crop soybean balance sheet by reducing projected exports by 75 million bushels from the May report to 1.7 billion bushels. This amount is the smallest quantity expected to be exported since the March 2016 report for the 2015-16 marketing year. This reduction in projected use increased soybean ending stocks for the 2018-19 marketing year to 1,070 million bushels (Table 2). The increase in stocks pushed the projected 2018-19 U.S. MYA farm price lower to \$8.50 per bushel.

The only change to the 2019 estimates is the increase in beginning stocks that flowed into the projected ending stocks. USDA did not adjust any supply or use estimates in June. USDA's Chief Economist told reporters that the July report will adjust the 2019 soybean supply and use estimates.

The marketing year for wheat begins in June, so the WASDE projections focus more on the 2019 crop and stocks projections. However, USDA did adjust old-crop wheat exports higher by 25 million bushels with a corresponding reduction in ending stocks.

USDA increased the 2019 wheat yield by 0.1-bushel to a projected yield of 48.7 bushels/acre. This translates into a 6 million bushel increase in production from the May report. Projected wheat supply was lowered by 19 million bushels due to the smaller carry-in more than offsetting the increase in production.

Table 3. U.S. Wheat Supply and Use.

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Acres (million)	50.1	46.1	47.8	45.8	-2.0
Harvested Acres (million)	43.9	37.6	39.6	39.0	-0.6
Yield (bushels/acre)	52.7	46.4	47.6	48.7	+1.1
----- Million Bushels -----					
Beginning Stocks	976	1,181	1,099	1,102	+3
Production	2,309	1,741	1,884	1,903	+19
Imports	118	157	140	140	+0
Total Supply	3,402	3,079	3,123	3,145	+22
Food	949	964	960	965	+5
Seed	61	63	62	68	+6
Feed and Residual	156	51	50	140	+90
Exports	1,055	901	950	900	-50
Total Use	2,222	1,980	2,022	2,073	+51
Ending Stocks	1,181	1,099	1,102	1,072	-30
Stocks/Use	53.2%	55.5%	54.5%	51.7%	-2.8%
Days of Stocks	194	203	199	189	-10
U.S. Marketing-Year Average Price (\$/bu)	\$3.89	\$4.72	\$5.20	\$5.10	-\$0.100

Source: June 2019 WASDE - USDA: WAOB.

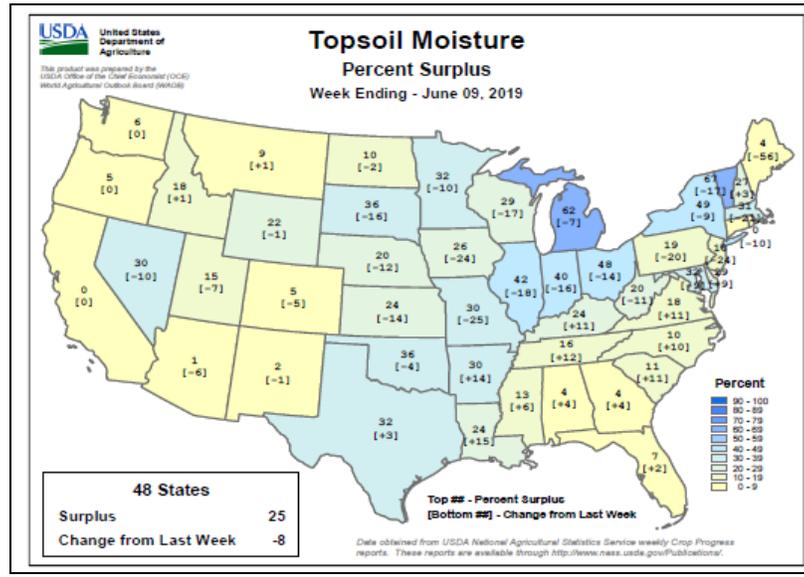
The only change in projected use was a 50-million bushel increase for wheat feed demand. USDA did not adjust any of the other demand categories.

Projected wheat stocks were lowered by 69 million bushels from the May report. The U.S. MYA wheat farm price was increased by \$0.40/bushel from the May estimate to \$5.10/bushel.

The corn market has been pulling wheat and soybean prices higher. Until the size of the 2019 corn and soybean crops are known, expect volatility and the potential for excellent pricing opportunities for corn and better than expected opportunities for soybeans. Wheat will go along for the ride so pay attention for opportunities as well.

Topic 2. Soil Moisture and Short-Term Precipitation and Temperature Outlook

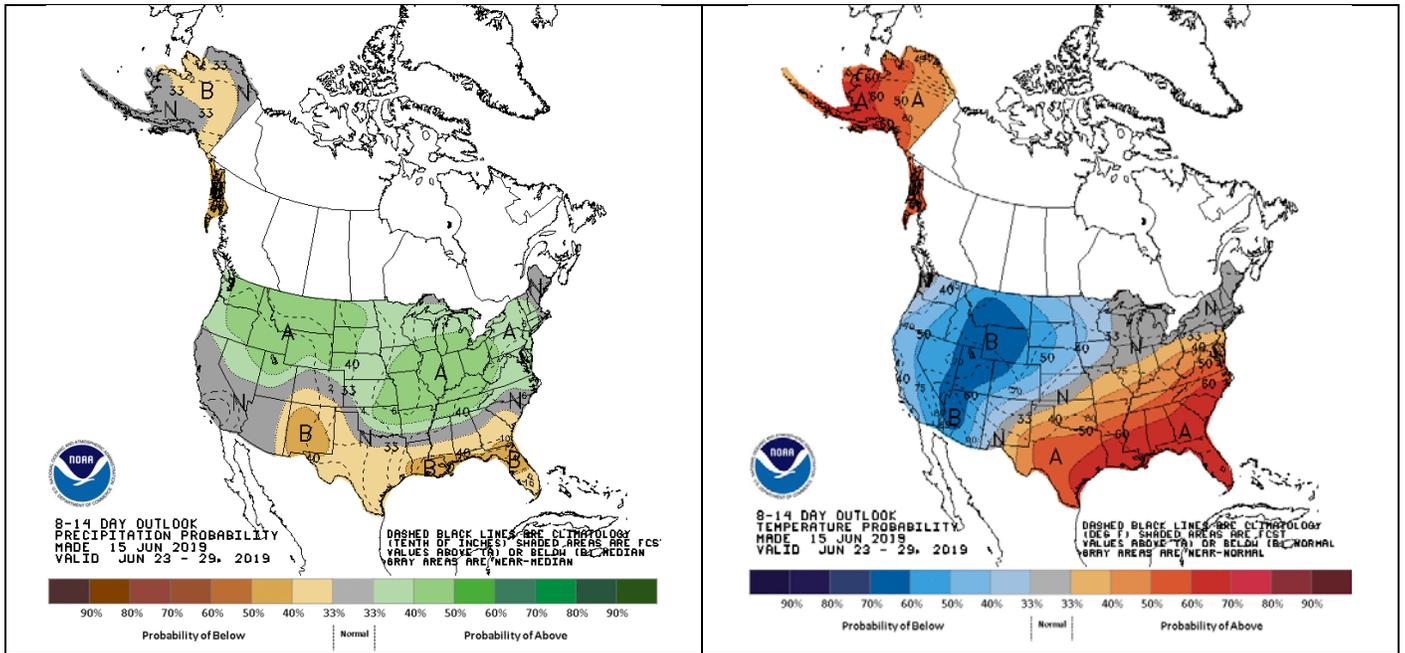
The historically slow corn and soybean planting progress have fueled discussion of the final planted area for corn and soybeans as well as the amount of prevented planted area chosen instead of planting a crop later than recommended. The topsoil moisture map below shows the percent of farmland with surplus moisture as of June 9, 2019. The change from the previous report is shown in parenthesis below the estimated percentage of land with excess moisture.



The Western Corn Belt, Iowa (26%) and Nebraska (20%) has a smaller percentage with surplus moisture than states east of the Mississippi River. Illinois (42%), Indiana (40%), Ohio (48%), and Michigan (62%) continue to struggle with excess soil moisture that prevents planting from progressing at an average pace.

Kentucky is rated to have 24% of the farmland with excess soil moisture. Relatively speaking, Kentucky's corn and soybean planting progress are closer to the average pace as compared to Illinois, Indiana, and Ohio.

The 8 to 14-day precipitation (below left) and temperature (below right) outlooks suggest there is an above average probability of more rain throughout the Corn Belt that will likely limit the attempts to plant corn. The Eastern Corn Belt is projected to have an above-average likelihood of precipitation but warmer temperatures that may help improve soil moisture conditions. In contrast, the Western Corn Belt is expected to have colder than average weather that will not provide the heat units needed to help late-planted corn.



Topic 3. 2019 Corn and Wheat Condition

USDA published the first corn condition rating for the 2019 crop as part of the June 9 *Crop Progress* report. USDA waits for 50% of the corn crop to emerge before surveying the percentage of the crop in very poor (VP), poor (P), fair (F), good (G), or excellent (E) condition. The fact that this estimate is first conducted on June 9 with 62% of the U.S. corn crop emerged further tells the story of the challenging 2019 crop year.

Table 4. Corn Crop Ratings Comparison for the 2018 and 2019 Crop Years for the Selected States.

	Very Poor + Poor	Good + Excellent	Change in Very Poor + Poor	Change in Good + Excellent
Illinois (#2)				
2018	3%	82%		
2019	12%	47%	+9%	-35%
Indiana (#5)				
2018	5%	75%		
2019	9%	53%	+4%	-22%
Iowa (#1)				
2018	2%	81%		
2019	10%	58%	+8%	-23%
Minnesota (#4)				
2018	1%	90%		
2019	7%	60%	+6%	-30%
Nebraska (#3)				
2018	1%	86%		
2019	4%	77%	+3%	-9%
Kentucky (#14)				
2018	3%	85%		
2019	2%	84%	-1%	-1%
U.S. 18-State Ranking				
2018	4%	77%		
2019	9%	59%	+5%	-18%

Source: USDA *Crop Progress* Report, June 10, 2019.

Table 4 compares the quality of the 2018 and 2019 corn crops for the top-five corn-producing states, Kentucky, and for the U.S. corn crop. The average ranking in corn production is provided with the state's name. For example, Iowa is the top corn-producing state, so #1 is included with the state's name.

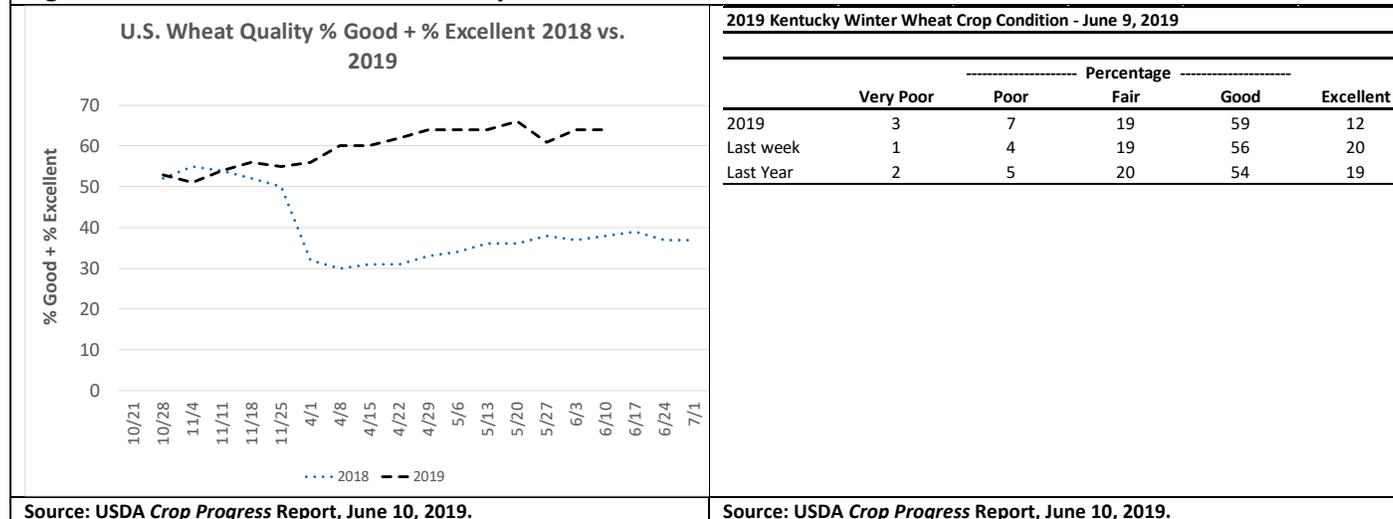
The U.S. corn crop is surveyed with 59% in good or excellent (G&E) condition as compared to 77% for the 2018 crop at the same point of the growing season. Similarly, the percentage rated in very poor or poor (VP&P) condition is higher for the 2019 corn crop. The two right side columns in Table 4 show the percentage change in crop condition for the two crop years.

The percentage of G&E corn in Illinois, Indiana, Iowa, and Minnesota are 35%, 22%, 23%, and 30% lower than last year's rating for June 9. Nebraska's corn crop was rated at 86% G&E in 2018 but is slightly smaller in 2019 at 77%. However, Nebraska's corn crop appears to be the top crop for the top-five corn-producing states.

Kentucky's corn crop is rated to be slightly lower quality than last year. Relatively speaking, Kentucky's crop is in good shape as compared to its northern neighbors.

Figure 1 shows the percentage of the U.S. wheat crop rated in good or excellent condition in 2019 as compared to the 2018 wheat crop. The 2018 winter wheat crop broke dormancy at about 30% good or excellent condition. The 2019 crop is in much better shape with 64% rated in good to excellent condition compared to 38% for the same date in 2018. Kentucky's winter wheat crop is currently estimated at 71% good to excellent condition as compared to 73% in 2018.

Figure 1. 2019 U.S. Wheat and Kentucky' Condition vs. 2018 Condition.



Topic 4. 2019 Corn and Soybean Planting Update and Statistical Unplanted Acres

Given the historically slow planting progress for the U.S. corn crop by June 9, combined with the forecast for the probability of more precipitation throughout the Midwest, the market is struggling with the question of how many corn acres will be planted late, filed as prevented planting, or switched to another crop. Topic 10 will discuss the price potential for various planted area and harvested yields for the U.S. corn and soybean crops.

Figure 2 shows the difference in corn planting progress for 2019 as compared to the five-year average for each state surveyed by USDA-NASS. The state's ranking in corn production is included in parenthesis behind the state name. Also, the top-five corn-producing states are shaded green while the 18-state U.S. average is shaded red.

Figure 2. 2019 Corn Planting Progress Lag vs. the Five-Year Average Planting Progress.

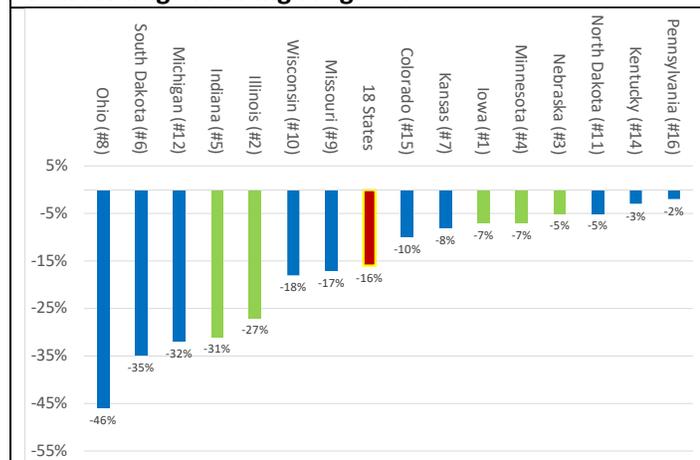


Figure 3. Statistical 2019 U.S. Corn Area Unplanted on June 9, 2019.

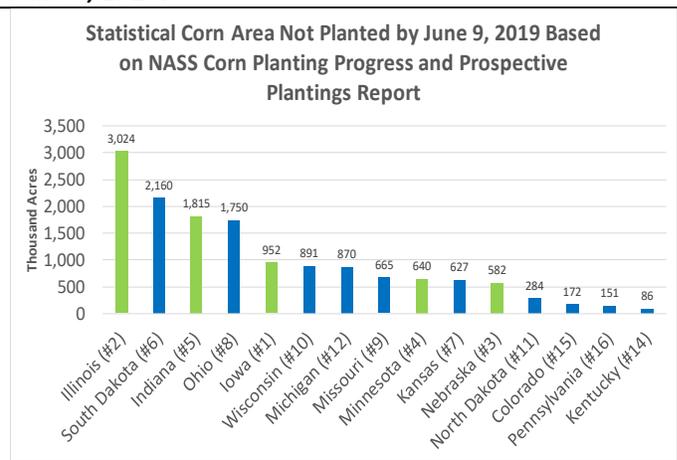
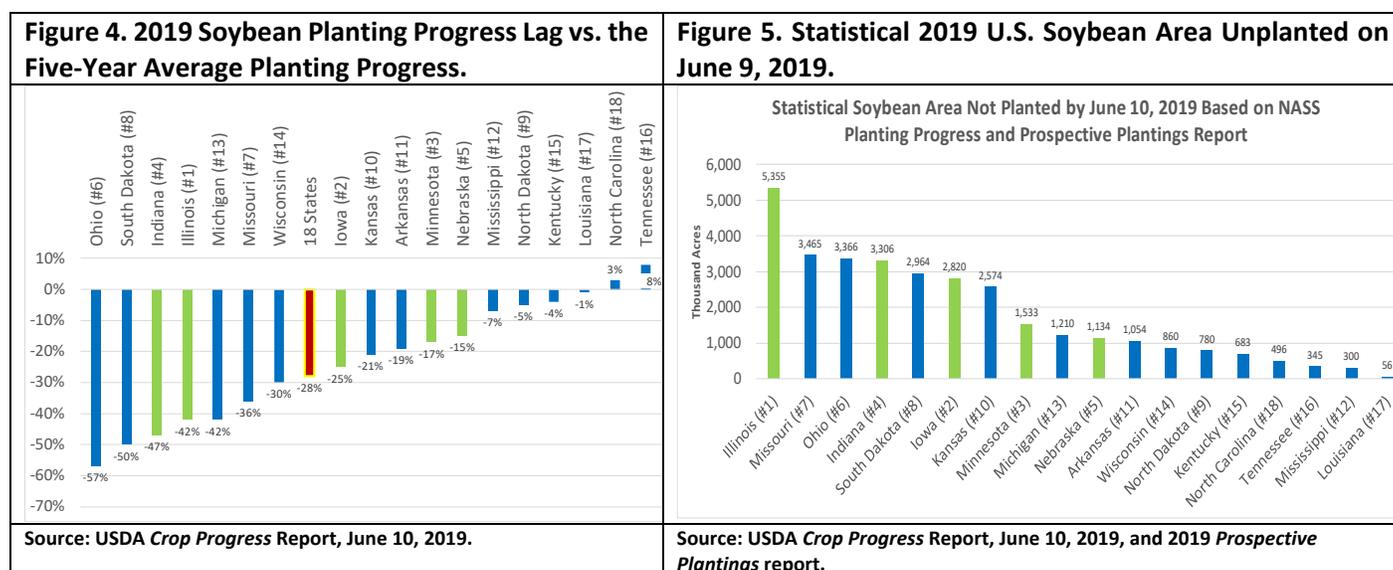


Figure 2 quantifies the impact of excess soil moisture discussed in Topic 2. Ohio was running 46% behind the five-year average for the June 9th report. Similarly, Indiana and Illinois were 31% and 27% behind their respective average planting progress.

Figure 3 shows the statistical corn area not planted on the June 9th survey for the *Crop Progress* report. The area remaining is estimated using the *Prospective Planting* survey estimates and the *Crop Progress* survey for each state surveyed by NASS. On June 9th, about 15.7 million intended corn acres were not planted. The top-five states had 7 million acres remaining to be planted with Illinois and Indiana at 3 million and 1.8 million acres, respectively. Also, South Dakota and Ohio had 2.1 and 1.7 million intended corn acres, respectively, remaining to be planted. The market is debating how many acres will be converted to soybeans or filed for prevented planting. The June *Acreage* report will not answer this question as planting will continue after the surveys are submitted to NASS.

Soybean planting progress is also running 28% behind the five-year average as of June 9, 2019. Figure 4 shows the soybean planting progress in 2019 compared to each state's five-year average. The top-five soybean-producing states are shaded green while the U.S. 18-state surveyed composite is shaded red.

The excess moisture problems for the states east of the Mississippi River are delaying soybean planting in Ohio (57%), Indiana (47%), Illinois (42%), and Michigan (42%) behind their respective soybean planting progress for June 9th. Kentucky and the Western Corn Belt states are faring better than those states in the Eastern Corn Belt (Figure 4).



The statistical unplanted soybean area as of June 9 is shown in Figure 5. The unplanted area is calculated using the *Prospective Plantings* survey estimate for each state and the soybean planting progress from the weekly *Crop Progress* report. Illinois is projected to have 5.3 million acres remaining to be planted while Indiana and Iowa are expected to have 3.3 and 2.8 million acres, respectively, unplanted (Figure 5). The top-five soybean producing states, shaded in green, are projected to have 14.1 million acres remaining to be planted and is about 41% of the unplanted soybean area. North Dakota and South Dakota, two states that typically have prevented planting, are projected to have 3.7 million acres unplanted on June 9, 2019. The total statistical soybean area remaining to be planted is projected at 33.8 million acres (Figure 5).

The acreage debate will most likely continue throughout the fall as the poor planting conditions will impact the failed acres and percentage of intended acres harvested. The production uncertainty is helping the corn market reach prices last seen in 2014. Since futures markets tend to move together, the production uncertainty in corn is assisting the soybean and wheat futures contracts to move higher. This topic is discussed further in Topic 9.

Topic 5. 2018 Corn and Soybean Basis; and 2019 Wheat Basis vs. Previous Years

Figure 6, Figure 7, and Figure 8 show the monthly average corn, soybean, and wheat spot basis, respectively, for twelve Western Kentucky markets. For each figure, the blue line represents the average basis for the 2013-15 crop

years, and the red line is the basis for the 2016 crop. The green line is the 2017 basis while the black dots represent the 2018 basis. The triangle in Figure 8 represents the 2019 basis for wheat.

The corn basis is \$0.06/bushel over the July corn contract, which is a \$0.30/bushel increase from harvest in October. Last year, the corn basis appreciated from October to June by \$0.25/bushel, which was \$0.14/bushel higher than the amount of appreciation in basis for the 2016 corn crop from harvest to June (Figure 6).

The average soybean basis, as of June 14, 2019, was -\$0.19/bushel under the July 2019 soybean contract. The basis is \$0.03 per bushel narrower than 2017 basis and the same as the 2016 basis (Figure 7). Last year, the basis appreciated \$0.30/bushel from October to June, but the 2016 crop's basis had an appreciation in the basis of \$0.01/bushel from harvest to June. Current basis appreciation for the 2018 crop is \$0.39/bushel from October to June (Figure 7).

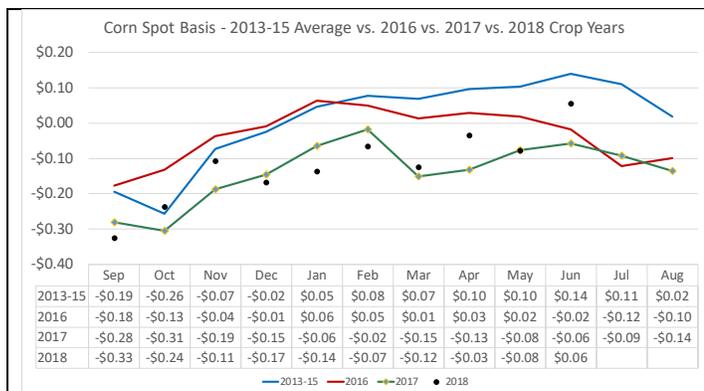


Figure 6. Western Kentucky Corn Spot Market Basis Appreciation from September to August for 2013 to 2018 Crop Years.
Basis Calculated on June 14, 2019

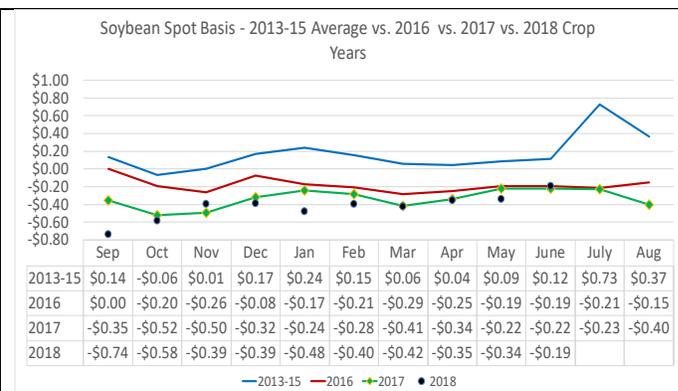


Figure 7. Western Kentucky Soybean Spot Market Basis Appreciation from September to August for 2013 to 2018 Crop Years.
Basis Calculated on June 14, 2019

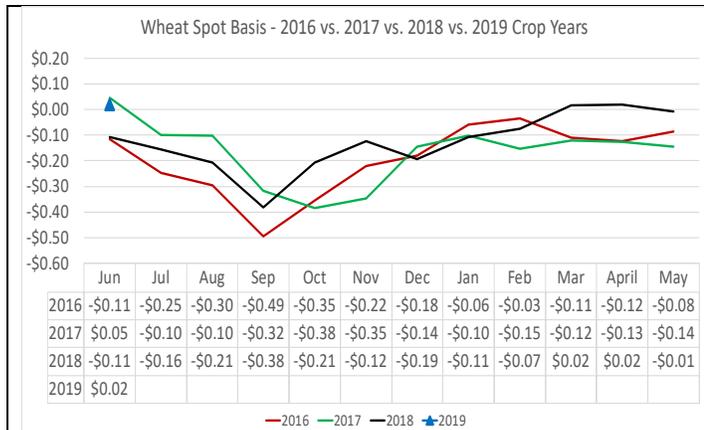


Figure 8. Western Kentucky Wheat Spot Market Basis Appreciation from June to May for 2016 to 2019 Crop Years.
Basis Calculated on June 14, 2019

The average wheat spot basis has been strengthening since October 2018. The average basis for the 2018 crop (black line) has been narrower than the 2017 crop and is stronger than the much weaker basis for the 2016 wheat crop.

The 2019 wheat basis is \$0.02/bushel above the July futures contract. Seasonality suggests that basis will widen into the fall. However, the fundamental struggle in the corn market may support a stronger wheat basis for the 2019 crop.

Topic 6. Projected Corn, Soybean, and Wheat Futures Trading Ranges to December 2019

Figures 9–11 provide the projected futures price trading range, by futures contract month, based on the contracts' volatility for the previous 21-day period for corn, soybeans, and wheat. The green lines represent the range that describes the 68% probability of the projected trading range with the red line representing a 95% likelihood of the expected trading range. Notice how these projections fan out for the contracts that will expire later in 2019. That is because there is more time until expiration; thus, there is a wider potential trading range for these deferred futures contracts.

Figure 9. Corn Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.

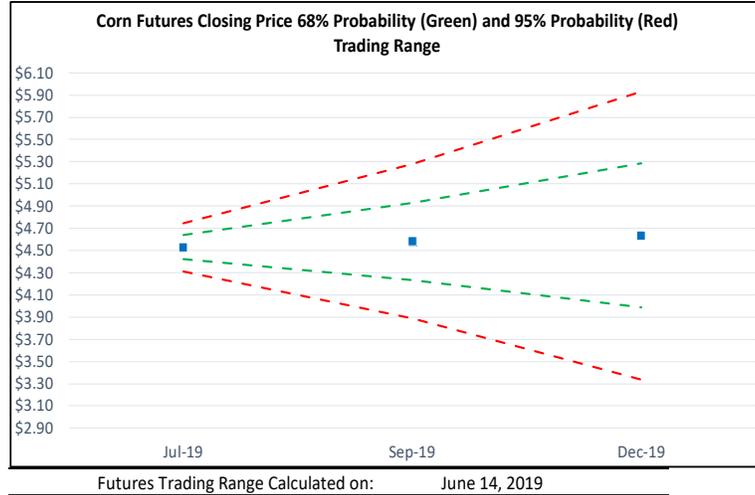
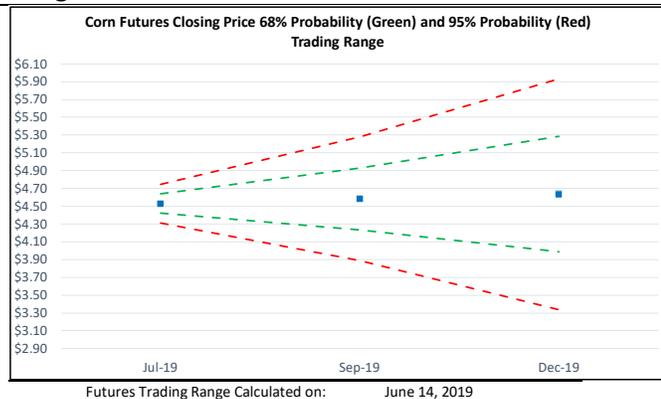


Figure 9 provides the probabilistic trading range for the corn futures contracts from July 2019 to December 2019. There is a 68% probability that the September 2019 corn contract will trade between \$4.23 and \$4.93 and a 95% probability that the September 2019 corn contract will trade between \$3.89 and \$5.28. Managers who are thinking about managing price risk for the 2019 corn crop should consider that there is a 68% probability that the December corn futures contract will trade between \$3.99 and \$5.28 per bushel (Figure 9).

Trading range calculated on June 14, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on June 14, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

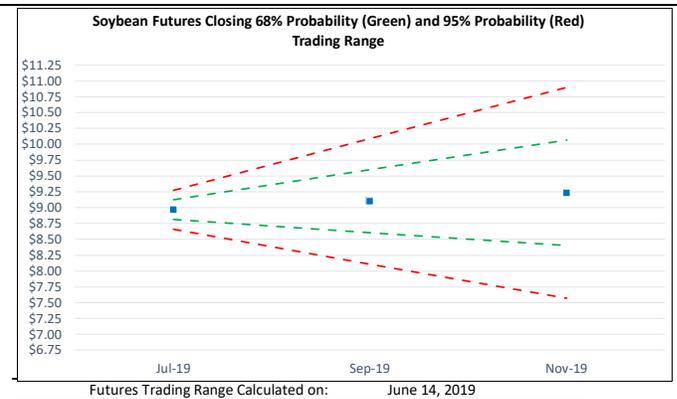
Figure 10 provides the probabilistic trading range for soybean futures contracts from July 2019 to November 2019. The November 2019 futures contract has a 68% probability of trading between \$8.40 and \$10.07 per bushel (Figure 10). The increased volatility in the soybean market contributes to this wide range in possible soybean prices for the new-crop soybean futures contracts.

Figure 10. Soybean Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on June 14, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on June 14, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 11. Wheat Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on June 14, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on June 14, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 11 provides the probabilistic trading range for wheat futures contract from July 2019 to December 2019 contracts. The September 2019 wheat contract has a 68% chance of trading between \$4.91 and \$5.93. Similarly, the December 2019 wheat contract has a 68% chance of trading between \$4.73 and \$6.34/bushel, which should also be monitored for managing 2019 wheat that is planned to be stored. The July 2020 Futures contract closed at \$5.60 on June 2014 and should be considered as a tool to manage price risk for producers planning on seeding wheat for 2020.

Topic 7. Pre-Harvest 2019 Corn and Soybean Risk Management Opportunities

Tables 5-7 analyze the effectiveness of using hedging with futures or put options in protecting revenue that covers total input costs, cash rent, overhead and family living for corn, soybeans, and double-crop soybeans in 2019.

Table 5 presents risk management alternatives for Western Kentucky corn production for 2019. Several yield projections are provided to show what yield is needed to find profitable pricing opportunities. Three risk management alternatives are compared. The first marketing alternative is to hedge with commodity futures, or HTA contracts, that would lock in an expected cash price at \$4.39/bushel assuming a -\$0.25/bushel harvest-time basis. The second is to lock in a cash price with a forward contract at \$4.50/bushel. The third alternative is to establish a price floor at \$4.00/bushel by buying a put option with a \$4.60 strike price that costs \$0.353.

Yield	<u>160</u>	<u>170</u>	<u>180</u>	<u>190</u>	<u>200</u>	<u>210</u>	
TVC+Rent+Overhead+Family Living (\$/acre)	\$670	\$670	\$670	\$670	\$670	\$670	
TVC+Rent+Overhead+Family Living (\$/bu)	\$4.19	\$3.94	\$3.72	\$3.53	\$3.35	\$3.19	
Hedge @ \$4.64+ -\$0.25 basis = \$4.39	+\$0.20	+\$0.44	+\$0.66	+\$0.86	+\$1.04	+\$1.19	
Forward Contract at \$4.50	+\$0.31	+\$0.56	+\$0.78	+\$0.97	+\$1.15	+\$1.31	
Put: \$4.60 strike @\$0.353 = \$4.00 floor	-\$0.19	+\$0.06	+\$0.27	+\$0.47	+\$0.65	+\$0.81	
Strategies Evaluated on:	June 14, 2019						

Table 5 demonstrates that the weather market is providing risk management opportunities for farmers that typically harvest 160-bushel corn or larger. Forward contracting may offer better risk protection by removing both futures price risk and basis risk.

Table 6 illustrates that the November 2019 futures contract, which declined in May, has recovered somewhat and is close to providing an opportunity to protect revenue for full-season soybeans. Managers should continue to monitor for opportunities to manage soybean revenue risk. A more substantial reduction in the planted area will support higher prices; however, the export demand issues will serve as an anchor to price until trade issues are resolved.

Yield	<u>45</u>	<u>50</u>	<u>55</u>	<u>60</u>	<u>65</u>	The soybean market is not offering risk management opportunities for yields 60-bushel or less. Managers should know their break-even prices to monitor the market for opportunities.
TVC+Rent+Overhead+Family Living (\$/acre)	\$528	\$528	\$528	\$528	\$528	
TVC+Rent+Overhead+Family Living (\$/bu)	\$11.73	\$10.56	\$9.60	\$8.80	\$8.12	
Hedge @ \$9.24 + -\$0.50 basis = \$8.74	-\$3.00	-\$1.83	-\$0.87	-\$0.07	+\$0.61	
Forward Contract at \$8.75	-\$2.98	-\$1.81	-\$0.85	-\$0.05	+\$0.63	
Put: \$9.20 strike @\$0.461 = \$8.24 floor	-\$3.49	-\$2.32	-\$1.36	-\$0.56	+\$0.12	
Strategies Evaluated on:	June 14, 2019					

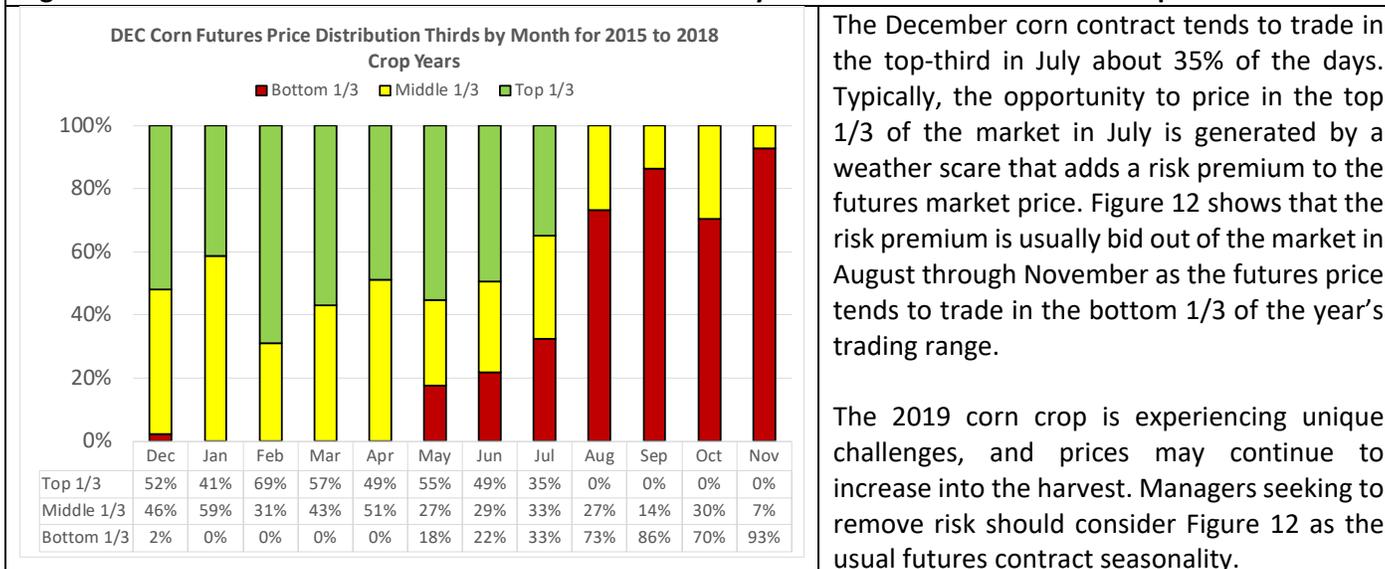
Yield	<u>35</u>	<u>40</u>	<u>45</u>	<u>50</u>	<u>55</u>	The market is providing an opportunity to protect double-crop soybean risk for those that typically harvest 45-bushel double-crop soybeans or better. Given the fundamental weakness for soybeans, managers should consider pricing a percentage of production that will be sold at harvest.
TVC+Rent+Overhead+Family Living (\$/acre)	\$393	\$393	\$393	\$393	\$393	
TVC+Rent+Overhead+Family Living (\$/bu)	\$11.21	\$9.81	\$8.72	\$7.85	\$7.14	
Hedge @ \$9.24 + -\$0.50 basis = \$8.74	-\$2.48	-\$1.08	+\$0.01	+\$0.89	+\$1.60	
Forward Contract at \$8.75	-\$2.46	-\$1.06	+\$0.03	+\$0.90	+\$1.61	
Put: \$9.20 strike @\$0.461 = \$8.24 floor	-\$2.98	-\$1.57	-\$0.48	+\$0.39	+\$1.10	
Strategies Evaluated on:	June 14, 2019					

Topic 8. Performance of Pre-Harvest Corn and Soybean Hedging Strategies

A focus of my Extension program involves helping producers understand how to use commodity futures to broaden the pricing window for grain sold at harvest or from storage. Farmers can hedge the 2019 corn and soybean crops before harvest using futures contracts instead of selling into the spot market after the crop is harvested. This topic will discuss the historical risk management benefit of hedging corn and soybeans before harvest using the December corn / November soybean futures contract hedged in July before harvest.

An essential part of the pre-harvest hedging decision is understanding the seasonality associated with the futures contract as prices tend to follow a seasonal pattern from winter to harvest in the fall. Figure 12 shows the seasonality for the December corn futures contract by identifying the price distribution by showing the likelihood of the July wheat contract trading in each year's top-third (green), middle-third (yellow), or the bottom-third price (red) from December to November for the 2015 to 2018 crop years.

Figure 12. December Corn Futures Price Distribution Thirds by Month for the 2015 to 2018 Crop Years.



The December corn contract tends to trade in the top-third in July about 35% of the days. Typically, the opportunity to price in the top 1/3 of the market in July is generated by a weather scare that adds a risk premium to the futures market price. Figure 12 shows that the risk premium is usually bid out of the market in August through November as the futures price tends to trade in the bottom 1/3 of the year's trading range.

The 2019 corn crop is experiencing unique challenges, and prices may continue to increase into the harvest. Managers seeking to remove risk should consider Figure 12 as the usual futures contract seasonality.

Table 8. Value of Pre-Harvest Hedging with the December Corn Futures Contract by Selling in July and Buying in October Harvest for the 2000 to 2018 Crop Years.

Year	\$/Bushel Change from July to Harvest	% Change from July to Harvest	Summary Statistics for Change in December Corn Futures from July to Harvest	
2000	\$0.08	4%	Average	-\$0.16
2001	-\$0.19	-9%		
2002	\$0.07	3%	Minimum	-\$2.53
2003	\$0.10	4%		
2004	-\$0.40	-19%	Average when less than Zero	-\$0.52
2005	-\$0.49	-24%		
2006	\$0.39	13%	Average when Greater than Zero	\$0.34
2007	\$0.15	4%		
2008	-\$2.53	-61%		
2009	\$0.35	9%		
2010	\$1.54	28%		
2011	-\$0.29	-5%		
2012	-\$0.02	0%		
2013	-\$0.58	-13%		
2014	-\$0.37	-11%		
2015	-\$0.37	-10%		
2016	-\$0.02	-1%		
2017	-\$0.46	-13%		
2018	\$0.02	0%		

Table 8 reports the change in the futures price from July to harvest for the 2000 to 2018 crops. The values shaded green represent years where hedging by selling a December corn futures contract in July and buying back at the October harvest would provide risk protection as compared to selling unprotected at harvest. Table 8 shows that the seasonal pattern existed during 2011-2013 crop years that are associated with the commodity boom years. Corn futures tend to decline from July to October about 58% of the years with the average price decrease of \$0.52/bushel

(15%). Hedging doesn't work every year with the average price increase of \$0.34/bushel (8%) in the years where prices increase into fall.

Managers expecting prices to continue to rally higher may not want to hedge right now. However, managers should understand their per bushel costs and evaluate how hedging a percentage of the crop to be sold at harvest can protect profitability as compared to selling unprotected at harvest.

The November soybean futures contract also follows a seasonal pattern. Figure 13 shows the percentage of the trading days where the contract price closed in the top 1/3, middle 1/3, or bottom 1/3 of the year's price range for the 2015 to 2018 crops. July has been the last best opportunity to hedge the November soybean contract for the 2015 to 2018 crops, as the futures price traded in the top 1/3 59% of the trading days.

Figure 13. November Soybean Futures Price Distribution Thirds by Month for the 2015 to 2018 Crop Years.

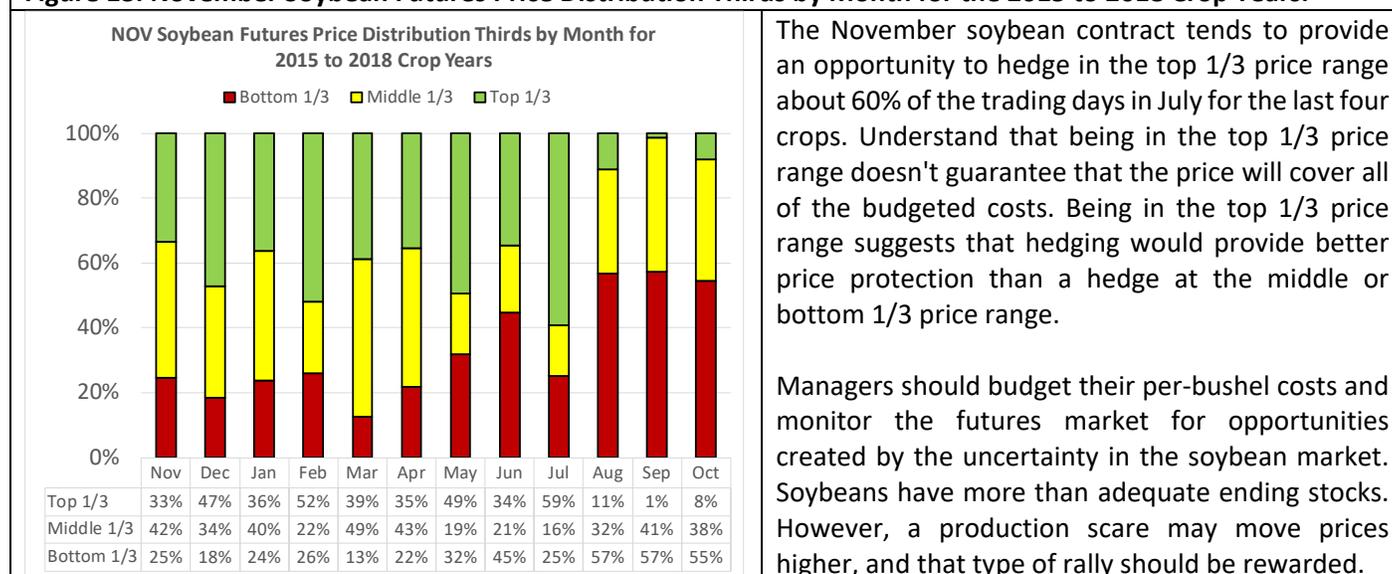


Table 9. Value of Pre-Harvest Hedging with the November Soybean Futures Contract by Selling in July and Buying in October Harvest for the 2000 to 2018 Crop Years.

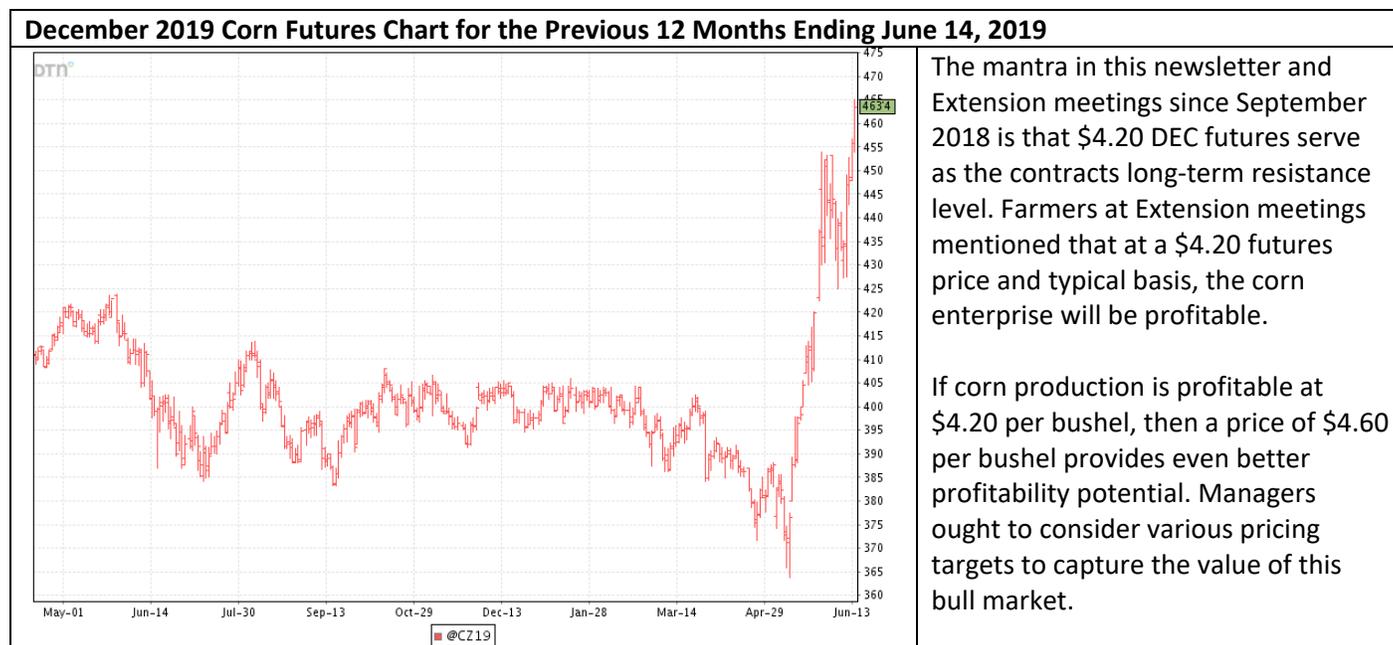
Year	\$/Bushel Change from July to Harvest	% Change from July to Harvest	Summary Statistics for Change in November Soybean Futures from July to Harvest	
			\$/bushel	% Change
2000	\$0.12	3%	Average	-\$0.42 -3%
2001	-\$0.63	-13%	Maximum	\$2.06 39%
2002	\$0.20	4%	Minimum	-\$5.70 -38%
2003	\$2.06	39%	% of Years Change is Less than Zero	63% 63%
2004	-\$1.02	-16%	Average when less than Zero	-\$1.17 -11%
2005	-\$1.27	-18%	% of Years Change is Greater than Zero	37% 37%
2006	-\$0.22	-4%	Average when Greater than Zero	\$0.86 12%
2007	\$0.94	11%		
2008	-\$5.70	-38%		
2009	\$0.37	4%		
2010	\$2.02	21%		
2011	-\$1.51	-11%		
2012	-\$0.34	-2%		
2013	\$0.33	3%		
2014	-\$1.32	-12%		
2015	-\$1.01	-10%		
2016	-\$0.62	-6%		
2017	-\$0.34	-3%		
2018	-\$0.08	-1%		

The change in the November soybean contract from July to October is shown in Table 9, where the green shaded cells represent the years where hedging would provide price protection. The November soybean futures contract is lower at harvest 63% of the years from 2000 to 2018, with the average price decline is \$1.17 per bushel (11%). While not hedging strategy works every year, Table 9 shows the value of hedging soybeans from 2014 to 2018 as the soybean market transitioned from limited stocks to more normal levels of ending stocks.

This article illustrates that futures can be used to expand the marketing window to protect the price for corn and soybeans to be sold at harvest. Managers should monitor their pricing opportunities and take advantage of better than expected prices. Remember the price decline into May and the general sense of pessimism of finding profitable pricing opportunities. Budgeted how hedging corn or soybeans on a percentage of expected production can benefit your farm’s cash flow and profitability potential.

Topic 9. December Corn Trading Days Frequency for the 2014 to 2019 Crop Years

The December 2019 corn futures market has provided an exciting ride for the last three weeks. The daily futures chart for the DEC 2019 contract is shown below to remind managers that the contract rallied about \$1/bushel from late April to June 14, 2019. The contract struggled to close above \$4.05 per bushel from September 2018 to June 2019 that current prices are welcome to those that can produce a corn crop this year.



A challenge of using the futures market to manage risk during a bull market is not getting absorbed by the emotion of locking in a futures price that is profitable but could go even higher. The feeling of missing out on an even higher price and the ability to talk about hedging at the top of the market with neighbors may keep some managers from acting on profitable prices.

Traders in the futures market will decide how much further the December 2019 contract will increase in price. The uncertainty in planted area, harvested area, and yield could definitely push prices higher between now and harvest. However, I believe that managers should temper their enthusiasm for higher prices with the reality of how the December corn futures contract has traded for the 2014 to 2019 crop years. Table 10 provides a distribution of the number of days the December corn contract closed at various price ranges each year. Notice that it was most common for the December corn contract to close at \$4/bushel or lower. Table 10 also shows that the futures contract failed to close above \$4.30/bushel for the 2017 and 2018 corn crops. The December 2019 corn futures contract is currently in the territory last traded in 2014. The December 2014 corn futures contract faced production uncertainty that pushed the contract to the \$5.10-\$5.20 per bushel price range.

Table 10. Number of Days the December Corn Futures Contract Closed in Various Price Ranges for the 2014 to 2019 Contracts.

Price Range	2014	2015	2016	2017	2018	2019
\$4.00 or less	101	140	227	240	192	75
\$4.00 - \$4.20	4	75	15	12	51	45
\$4.20 - \$4.30	2	12	1		9	
\$4.30 - \$4.40	2	21	7			6
\$4.40 - \$4.50	21	3	3			5
\$4.50 - \$4.60	38	1				2
\$4.60 - \$4.70	23					1
\$4.70 - \$5.00	41					
\$5.00 - \$5.10	16					
\$5.10 - \$5.20	3					
Number of Trading Days	251	252	253	252	252	134

Date: June 14, 2019.

Table 11 provides a summary of the corn balance sheet for the 2014 to 2019 crop years using the June 2019 report for the new crop. A significant difference between the 2014 and 2019 balance sheets is the 2014 carry-in is almost 900 million bushels less than the 2019 projected carry-in (Table 11). The 2019 crop has some additional cushion to withstand a smaller crop, and that may limit price potential for the futures contract. Table 11 also illustrates the demand tightening associated with the 2014 crop that may provide resistance in the futures contract.

Table 11. Balance Sheet Summaries for the 2014 to 2019 (June Estimate) Marketing Years

	2014	2015	2016	2017	2018	2019
	----- Million Bushels -----					
Beginning Stocks	1,232	1,731	1,737	2,293	2,140	2,195
Production	14,216	13,602	15,148	14,609	14,420	13,680
Supply	15,479	15,401	16,942	16,939	16,595	15,925
Use	13,748	13,664	14,649	14,799	14,400	14,250
Ending Stocks	1,731	1,737	2,293	2,140	2,195	1,675
Stocks-to-Use	12.6%	12.7%	15.7%	14.5%	15.2%	11.8%
Days of Stocks	46	46	57	53	56	43
Marketing Year Average Price	\$3.70	\$3.61	\$3.36	\$3.36	\$3.60	\$3.80

This article is to serve as a reminder of where the current price level is relative to recent history. I've heard the saying that "history doesn't repeat itself, but it does rhyme." The 2019 corn crop does not have an analogous year, so a comparison to 2014 is a reminder to how the futures contract has traded in the best year of the last five years. Managers should remind themselves of past price potential to establish marketing targets to take advantage of this weather market.

Topic 10. Potential 2019-20 Corn and Soybean Balance Sheets

The theme of this newsletter has been production uncertainty for the corn and soybean crop may provide pricing opportunities and better than expected profitability potential. The market will debate the size of both crops until harvest, which will create volatility and pricing opportunities. Corn planted area and yield are expected to decline further from the June estimates. Soybean planted area could increase if farmers switch intended corn area to soybeans. Alternatively, soybean area could decrease if planting is delayed and prevented planting becomes an option for soybeans. Soybean yields could also be trimmed from the trend yield of 49.5 bushels/acre.

The projected 2019-20 U.S. corn balance sheet provided in Table 12 assumes that planted area is reduced by 1 million and by 2.5 million acres from the estimates in the June report. The yield is assumed to be 166 bushels/acre, with a sensitivity analysis of a 163-bushel yield. Total use is projected at 14.25 billion bushels and is based on the June WASDE projections.

If farmers plant 88.8 million acres and the 166 bushels per acre yield is achieved, then corn stocks are projected to decrease by 154 million bushels from the expected 1.675 billion in the June report for 2019-20 to 1.521 billion bushels (Table 12). The projected stocks-to-use ratio would be 10.7%, and the U.S. marketing year average (MYA) farm price would increase to \$3.90 per bushel (Table 12). A yield of 163 bushels/acre would cause stocks to decrease from the June report to 1.277 billion bushels and increase the U.S. MYA price to \$4.25/bushel.

Table 12. Projected 2019-20 U.S. Corn Balance Sheet for Projected and Reduced Planted Area.					
	June 2019 WASDE	-1 Million Acres Same Yield	-1 Million Acres -3 bushel Yield	-2.5 Million Acres Same Yield	-2.5 Million Acres -3 bushel Yield
Planted (million)	89.8	88.8	88.8	87.3	87.3
Harvested (million)	82.4	81.5	81.5	80.1	80.1
Yield (bu/acre)	166	166	163	166	163
----- Million Bushels -----					
Beginning Stocks	2,195				
Production	13,680	13,526	13,282	13,298	13,057
Imports	<u>50</u>				
Total Supply	15,925	15,771	15,527	15,543	15,302
Domestic Use	12,100				
Exports	<u>2,150</u>				
Total Use	14,250	14,250	14,250	14,250	14,250
Ending Stocks	1,675	1,521	1,277	1,293	1,052
Days of Stocks	43	39	33	33	27
Stocks-to-Use Ratio	11.8%	10.7%	9.0%	9.1%	7.4%
U.S. Average Farm Price	\$3.80	\$3.90	\$4.25	\$4.10	\$4.95
Source: June 2019 WASDE - USDA WAOB. Author's calculations.					
Source: USDA-World Agricultural Outlook Board and Author's Projections.					

If weather prevents 2.5 million acres from being planted and yields are 166-bushels, then corn stocks could decline to 1.293 billion bushels. The U.S. MYA price would be \$4.10/bushel. If the U.S. yield is 163-bushels, then stocks could decrease to 1.052 billion bushels and would support a price of \$4.95/bushel. As the stocks-to-use ratio falls below 7%, the U.S. MYA farm price would respond above \$5/bushel.

The corn market has little relative cushion to withstand a production loss.

Table 12 serves as a reminder that the corn market's expected stocks of 1.675 billion bushels could erode quickly. The assumptions in Table 12 are relatively conservative, and a yield below 160-bushels with a reduction in the planted area will trigger a further decrease in demand and the potential for higher prices.

The projected 2019-20 U.S. soybean balance sheet is provided in Table 13 analyzes the impact of increased soybean area and reduced soybean area with a lower yield.

Table 13. Projected 2019-20 U.S. Soybean Balance Sheet for Projected and Increased Planted Area.					
	June 2019 WASDE	+ 1.5 Million Acres Same Yield	+ 1.5 Million Acres -3 bushel Yield	- 2 Million Acres Same Yield	- 2 Million Acres -3 bushel Yield
Planted (million)	84.6	86.1	86.1	82.6	82.6
Harvested (million)	83.8	85.3	85.3	81.8	81.8
Yield (bu/acre)	49.5	49.5	46.5	49.5	46.5
----- Million Bushels -----					
Beginning Stocks	1,070				
Production	4,150	4,222	3,966	4,050	3,805
Imports	<u>20</u>				
Total Supply	5,240	5,312	5,056	5,140	4,895
Domestic Use	2,245				
Exports	<u>1,950</u>				
Total Use	4,195	4,195	4,195	4,195	4,195
Ending Stocks	1,045	1,117	861	945	700
Days of Stocks	91	97	75	82	61
Stocks-to-Use Ratio	24.9%	26.6%	20.5%	22.5%	16.7%
U.S. Average Farm Price	\$8.25	\$8.10	\$8.60	\$8.35	\$9.00
Source: June 2019 WASDE - USDA WAOB. Author's calculations.					
Source: USDA-World Agricultural Outlook Board and Author's Projections.					

If the U.S. plants 86.1 million acres and harvests the trend-yield of 49.5-bushels, the total supply will exceed 5.3 billion bushels. Assuming total use of 4.195 billion bushels, soybean stocks would increase from the June projections to 1.11 billion bushels. The stocks-to-use ratio of 26.6% suggests a U.S. MYA price of \$8.10/bushel. A yield of 46.5-bushels would decrease stocks to 861 million bushels and causes prices to increase to \$8.60/bushel.

If soybean planted area is reduced by 2 million acres and a trend-yield is harvested, soybean stocks would decline to 945 million bushels, and the U.S. MYA price would be \$8.35/bushel. If the yield is 46.5-bushels with the smaller area, the soybean crop would be 3.8 billion bushels. Assuming the same demand as in the June report, soybean stocks would decline to 700 million bushels. The U.S. MYA price would approach \$9.00/bushel for the 345 million bushel reduction in stocks from the June 2019 estimates for the 2019 soybean crop (Table 13).

The corn market is providing support to the soybean market. If the Midwest continues to receive precipitation that delays or prevents soybean planting, then declining stocks will support higher soybean prices.

Topic 11. How Do I Get on the Email Distribution List to Receive this Newsletter?

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/extcmu.php>. Email todd.davis@uky.edu to receive the newsletter by email.

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