

# Crops Marketing and Management Update

## Grains and Forage Center of Excellence

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### Topics in this Month's Update:

1. **August *Crop Production* Report Raises Questions about the Corn and Soybean Crops**
2. **August *WASDE* Report: Larger than Expected Crops Destroys Corn and Soybean Markets**
3. **Short-Term Precipitation and Temperature Outlook**
4. **2019 Corn and Soybean Condition and Progress**
5. **2018 Corn and Soybean Basis; and 2019 Wheat Basis vs. Previous Years**
6. **Projected Corn, Soybean, and Wheat Futures Trading Ranges to July 2020**
7. **Pre-Harvest 2019 Corn and Soybean Risk Management Opportunities**
8. **2019 Projected Return to Storage for Corn and Soybeans**
9. **Post-Harvest 2019 Corn and Soybean Risk Management Opportunities**
10. **Potential 2019-20 Corn and Soybean Stocks-to-Use and Price Potential**
11. **Upcoming Grain Outlook and Risk Management Webinars**
12. **How Do I Get on the Email Distribution List to Receive this Newsletter?**

### Topic 1. August *Crop Production* Report Raises Questions about the Corn and Soybean Crops

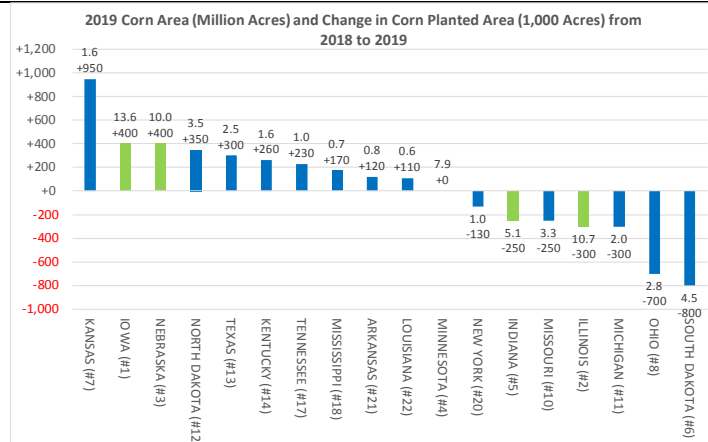
In a typical year, the August *Crop Production* report provides insight into the size of the corn and soybean crops. The historically late-planted corn and soybean crops have created uncertainty about the planted area and yield potential. The August reports included a re-survey of planted area in states that account for 85% of U.S. corn and soybean production. The August *Crop Production* report did not incorporate the in-field measurements of plant population, ear count or pod count as in previous years. The report reflects analyses of satellite imagery and farmer surveys. As a result, the markets still face uncertainty regarding yield and harvested area.

Analysts surveyed before the release expected the 2019 corn crop to be 13.16 billion bushels, which would be 711 million bushels lower than the July estimate and 1.26 billion bushels lower than the 2018 crop. USDA currently pegs the 2019 corn crop at 13.9 billion bushels, which is 736 million bushels above the average analyst expectation. If realized, the 2019 corn crop would be 520 million bushels smaller than last year's crop.

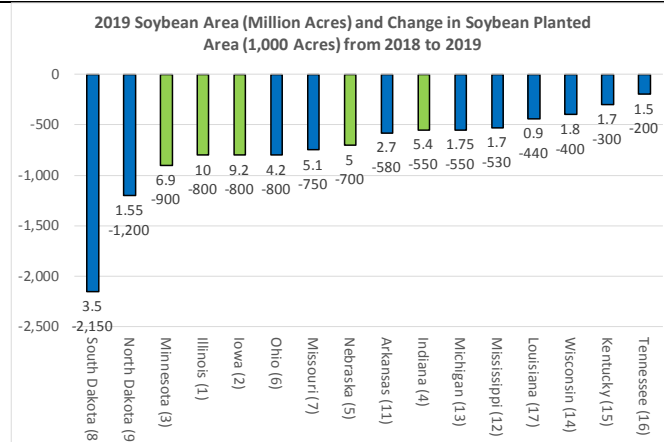
USDA's re-surveying of corn planted area projects 2019 corn area at 90 million acres, which is 1.7 million acres less than measured by the June *Acreage* survey. Figure 1 illustrates the change in planted corn area from 2018 to 2019 and the 2019 planted area for selected states. Kansas increased corn planted area by 950 thousand acres from 2018 to 1.6 million acres. The top-five corn-producing states, colored green in Figure 1, increased corn area by 250 thousand acres from 2018. Iowa and Nebraska both increased area by 400 thousand acres, while Illinois and Indiana reduced corn area by 300 and 250 thousand acres, respectively. USDA projects U.S. corn planted area to be 900 thousand acres

above last year's planted area. Figure 1 demonstrates that most of the planted area increase occurred outside of the top-five corn-producing states. Similarly, most of the reduction in the planted area occurred outside of the core corn growing area.

**Figure 1. 2019 Corn Area (Million Acres) and Change in Planted Area (1,000 Acres) from 2018 to 2019.**



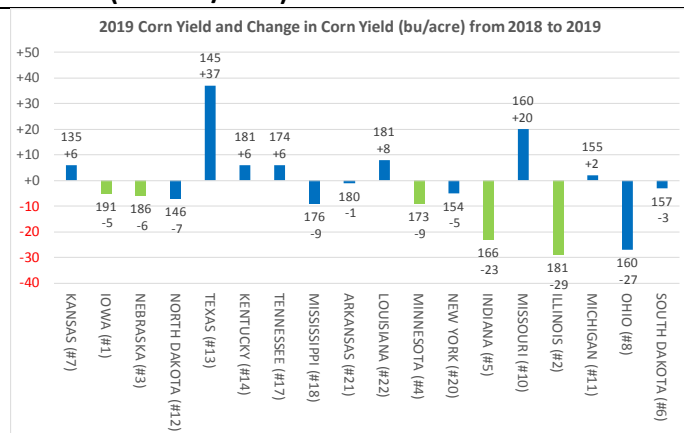
**Figure 2. 2019 Soybean Area (Million Acres) and Change in Planted Area (1,000 Acres) from 2018 to 2019.**



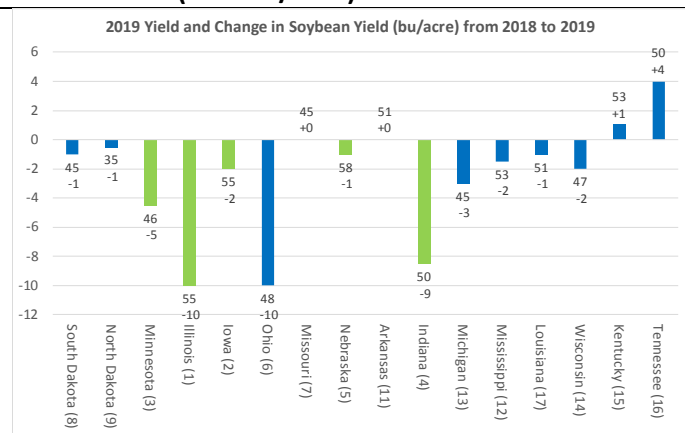
USDA surprised the market by estimating 2019 soybean planted area at 76.7 million acres, which is 12.5 million acres less than the 2018 crop. Analysts surveyed before the report release expected the 2019 soybean crop at 3.78 billion bushels, which would be 771 million bushels smaller than the 2018 crop. USDA currently pegs the 2019 soybean crop at 3.68 billion bushels, which would be 874 million bushels less than the 2018 crop if realized.

South Dakota has the largest reduction in corn area from 2019 (-800 thousand, Figure 1), and the largest reduction in soybean area at -2.15 million acres (Figure 2). Figure 2 illustrates that the soybean area is reduced in the top 20 soybean-producing states for 2019. The top-five soybean-producing states, colored green, reduced soybean plantings by 3.75 million acres from last year (Figure 2). The reduced soybean area and late planting dates in the key states help drive the projected 864 million bushel decline in soybean production.

**Figure 3. 2019 Corn Yield and Change in Yield from 2018 to 2019 (Bushels/Acre).**



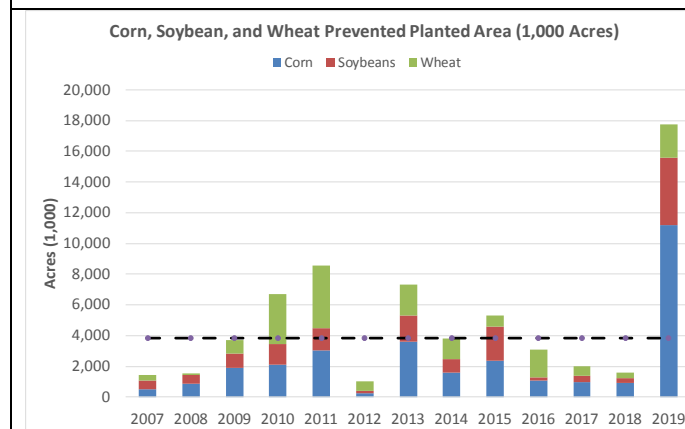
**Figure 4. 2019 Soybean Yield and Change in Yield from 2018 to 2019 (Bushels/Acre)**



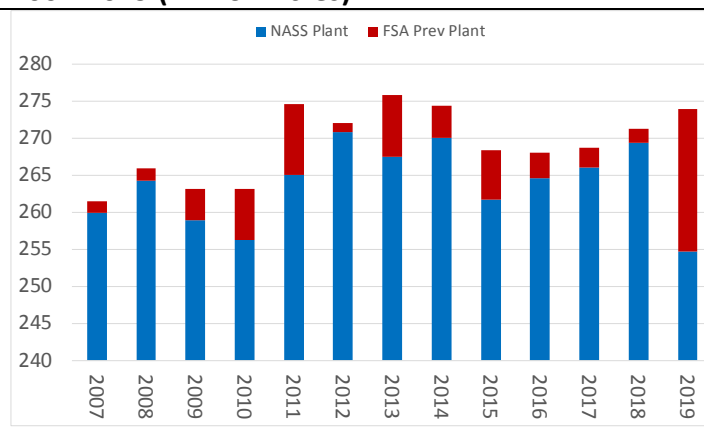
The August report also provided the first yield projections for the 2019 corn (Figure 3) and soybean (Figure 4) crops. Both figures report the 2019 yield projection with the change from last year. For corn, the top-five corn states are projected to have -5 (Iowa), -6 (Nebraska), -9 (Minnesota), -23 (Indiana), and -29 (Illinois) lower yields from last year. Ohio, ranked 8<sup>th</sup> in corn production, is also projected to have a yield that is 27 bushels/acre lower than last year (Figure 3). Those states with projected yields above last year are outside of the core producing area like Texas (+37), and Missouri (+20).

Soybean yields are projected to be lower than 2018 in the top-five states with Minnesota (-5), Iowa (-2), Nebraska (-1), Illinois (-10), and Indiana (-9) below their 2018 yields. Current yield projections are for lower yields for most of the top eighteen states surveyed by NASS, except Kentucky (+1) and Tennessee (+4) (Figure 4).

**Figure 5. Corn, Soybean, and Wheat Prevented Planted Area (1,000 Acres) from 2007-2019.**



**Figure 6. Total NASS Planted Area and FSA Prevented Planted Acres for 12 Major Row Crops for 2007-2019 (Million Acres).**



One issue that caused confusion and frustration from the August series of reports is the 2019 FSA prevented planting acres for 2019. Currently, FSA reports 11.2 million corn acres, 4.35 million soybean acres, and 2.2 million wheat acres as prevented planting (Figure 5). FSA has released prevented planting data since 2007, with the average amount for corn, soybean, and wheat at 3.8 million acres for the 2007-2018 crop years. This large amount of prevented planting implies that farmers intended to plant over 101 million corn acres in 2019. In retrospect, it is more likely that corn farmers chose to file prevented planting crop insurance because of the larger prevented planting indemnity instead of mudding in a late corn crop or planting an unprofitable soybean crop. When comparing the total NASS planted acres for the top 12 row crops and include the FSA prevented planting acres for those 12 crops, the total area for 2019 is similar to the area in 2013 and 2014 (Figure 6).

## Topic 2. August WASDE Report: Larger than Expected Crops Destroys Corn and Soybean Markets

The August WASDE incorporates the production projections from the *Crop Production* report. For corn, this means the larger than expected corn crop of 13.9 billion bushels is assumed for the 2019 corn crop (Table 1).

**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	90.0	+0.9
Harvested Area (million)	86.7	82.7	81.7	82.0	+0.3
Yield (bushels/acre)	174.6	176.6	176.4	169.5	-6.9
----- Million Bushels -----					
Beginning Stocks	1,737	2,293	2,140	2,360	+220
Production	15,148	14,609	14,420	13,901	-519
Imports	<u>57</u>	<u>36</u>	<u>30</u>	<u>50</u>	+20
Total Supply	16,942	16,939	16,590	16,311	-279
Feed and Residual	5,472	5,304	5,275	5,175	-100
Food, Seed & Industrial	6,883	7,056	6,855	6,905	+50
Ethanol and by-products	5,432	5,605	5,425	5,475	+50
Exports	<u>2,293</u>	<u>2,438</u>	<u>2,100</u>	<u>2,050</u>	-50
Total Use	14,649	14,799	14,230	14,130	-100
Ending Stocks	2,293	2,140	2,360	2,181	-179
Stocks/Use	15.7%	14.5%	16.6%	15.4%	-1.1%
Days of Stocks	57	53	61	56	-4
U.S. Marketing-Year Average Price (\$/bu)	\$3.36	\$3.36	\$3.60	\$3.60	+\$0.00

Source: August 2019 WASDE - USDA: WAOB.

The August report reduced old-crop imports by 5 million bushels and reduced ethanol demand by 25 million bushels for a net increase in old-crop stocks by 20 million bushels to 2.36 billion (Table 1).

The 2019 corn crop, if realized, will be 519 million bushels smaller than the 2018 crop. The large carry-in and larger expected corn imports mute the impact of the smaller corn crop on supply. USDA project the 2019 corn supply at 16.3 billion bushels, which is 279 million bushels less than 2018.

Corn demand is projected slightly lower to 14.1 billion bushels with increased ethanol use offsetting lower exports. Feed use is projected lower in response to a smaller corn crop (Table 1).

The 2019-20 corn ending stocks is currently projected at 2.18 billion bushels, which would be 179 million bushels less than last year if realized. The stocks-to-use ratio is projected to decline slightly. However, USDA is projecting the U.S. marketing year average (MYA) farm price to remain at \$3.60 per bushel (Table 1).

<b>Table 2. U.S. Soybean Supply and Use.</b>					
	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Area (million)	83.4	90.2	89.2	76.7	-12.5
Harvested Area (million)	82.7	89.5	88.1	75.9	-12.2
Yield (bushels/acre)	52	49.3	51.6	48.5	-3.1
----- Million Bushels -----					
Beginning Stocks	197	302	438	1,070	+632
Production	4,296	4,412	4,544	3,680	-864
Imports	22	22	17	20	+3
Total Supply	4,515	4,735	4,999	4,771	-228
Crushings	1,901	2,055	2,065	2,115	+50
Exports	2,174	2,129	1,700	1,775	+75
Seed	105	104	89	96	+7
Residual	34	9	75	30	-45
Total Use	4,213	4,297	3,929	4,016	+87
Ending Stocks	302	438	1070	755	-315
Stocks/Use	7.2%	10.2%	27.2%	18.8%	-8.4%
Days of Stocks	26	37	99	69	-30.8
U.S. Marketing-Year Average Price (\$/bu)	\$9.47	\$9.33	\$8.50	\$8.40	-\$0.10
Source: August 2019 WASDE - USDA: WAOB.					

USDA made minor adjustments to the old-crop balance sheet by reducing crushing demand by 20 million bushels from the previous report. As a result, old-crop ending stocks were increased by 20 million bushels.

The August *Crop Production* estimates were adopted in the *WASDE* report, which implies a 2019 soybean crop that is 864 million bushels smaller than last year's crop. USDA projects harvested area down 12.2 million acres to 75.9 million. Yield is projected at 48.5 bushels/acre down 3.1 bushels from last year.

The projected carry-in at 1.07 billion bushels limits the impact of a smaller crop with total supply projected lower by only 228 million bushels.

USDA projects 2019-20 soybean stocks at 755 million bushels, which is a 315 million bushel reduction from last year. The large relative stocks-to-use of 18.8% will limit prices from moving higher. USDA currently projects a U.S. MYA farm price of \$8.40 per bushel, which is \$0.10/bushel less than last year's MYA price (Table 2).

<b>Table 3. U.S. Wheat Supply and Use.</b>					
	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Acres (million)	50.1	46.1	47.8	45.6	-2.2
Harvested Acres (million)	43.9	37.6	39.6	38.4	-1.2
Yield (bushels/acre)	52.7	46.4	47.6	51.6	+4.0
----- Million Bushels -----					
Beginning Stocks	976	1,181	1,099	1,072	-27
Production	2,309	1,741	1,884	1,980	+96
Imports	118	157	135	135	+0
Total Supply	3,402	3,079	3,118	3,187	+69
Food	949	964	955	960	+5
Seed	61	63	60	68	+8
Feed and Residual	156	51	96	170	+74
Exports	1,055	901	936	975	+39
Total Use	2,222	1,980	2,046	2,173	+127
Ending Stocks	1,181	1,099	1,072	1,014	-58
Stocks/Use	53.2%	55.5%	52.4%	46.7%	-5.7%
Days of Stocks	194	203	191	170	-21
U.S. Marketing-Year Average Price (\$/bu)	\$3.89	\$4.72	\$5.16	\$5.00	-\$0.160
Source: August 2019 WASDE - USDA: WAOB.					

USDA increased the projected wheat yield to 51.6 bushels/acre from last month's projection. The 1.6-bushel increase translates to a 59 million bushel increase in projected production from July to 1.98 billion bushels. Total supply is projected at 3.18 billion bushels, a 69 million bushel increase from last.

Wheat demand is projected to increase by 127 million bushels from last year. USDA projects slightly higher exports at 975 million bushels. Feed use is projected to be 74 million bushels above 2018 due to an expected smaller corn crop. Both projections might be reduced in future reports, which would increase ending stocks.

Current ending stocks are projected at 1.01 billion bushels, which is slightly less than last year (Table 3).

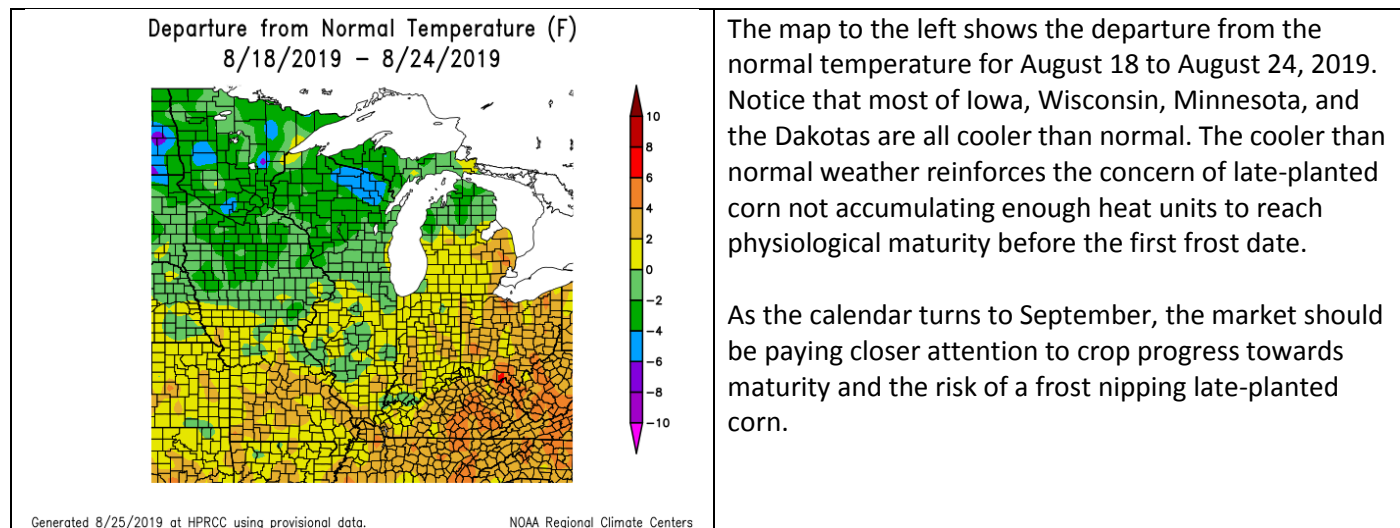
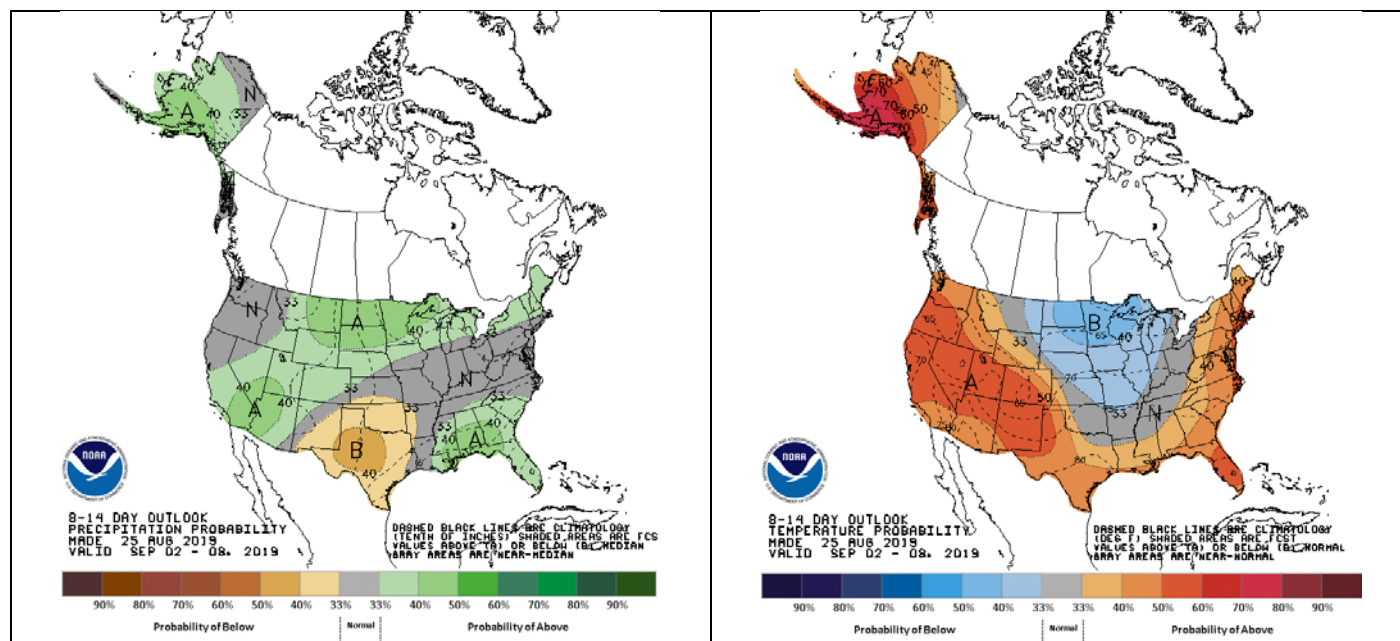
USDA projects the U.S. MYA farm price at \$5.00/bushel, which is \$0.16/bushel below last year's MYA price (Table 3). While the days of wheat stocks are projected to decline by 21 days, stocks are sufficient to withstand a stronger than expected increase in use, which would move, prices higher.

Since the *WASDE* was released on August 12, the December corn futures contract declined \$0.25/bushel from August 12, 2019, to August 23, 2019. Similarly, the November soybean futures contract has declined by \$0.23/bushel from the report's release to the close on Friday, August 23.

### Topic 3. Short-Term Precipitation and Temperature Outlook

The 8 to 14-day precipitation (below left) outlook suggest there is an above-average probability of rain throughout northern Iowa, Nebraska, and the Dakotas. The eastern Corn Belt states of Illinois, Indiana, and Ohio have a neutral probability of precipitation for the next 8 to 14 days.

The temperature outlook (below right) forecasts below-normal temperatures will continue across the Midwest for the next 8 to 14-day period. The below-normal temperatures will not help late-planted corn in the race to catch-up on progressing towards physiological maturity.



The map to the left shows the departure from the normal temperature for August 18 to August 24, 2019. Notice that most of Iowa, Wisconsin, Minnesota, and the Dakotas are all cooler than normal. The cooler than normal weather reinforces the concern of late-planted corn not accumulating enough heat units to reach physiological maturity before the first frost date.

As the calendar turns to September, the market should be paying closer attention to crop progress towards maturity and the risk of a frost nipping late-planted corn.

### Topic 4. 2019 Corn and Soybean Condition and Progress

The late-planted corn and soybean crops are in worse condition than the 2018 crops. Table 4 and Table 5 report the percentages of the corn and soybean crops, respectively, rated in very poor plus poor (VPP) and good and excellent (GE) condition for the U.S., the top-five producing states, and Kentucky as of August 25, 2019. The tables also show the change in the ratings from 2018, the 2018 yield, and the August projected 2019 yield. The states east of the Mississippi River have a larger percentage of corn in VPP condition this year as compared to 2018. Also, those states east of the Mississippi River have a smaller percentage rated in GE condition this year compared to last year. For example, Illinois



has 17% of the 2019 corn crop rated in VPP condition and 49% rated in GE condition as of August 25, 2019. The Illinois crop has 12% more rated in VPP and 27% less in GE condition this year as compared to the 2018 corn crop.

The message from Table 4 is that the late-planted corn crop is in worse condition than the 2018 crop, and the market will price in additional potential yield loss if weather stress occurs before the crop reaches physiological maturity. Anecdotal stories from farmers throughout the Midwest is that the corn crop needs an extra month in the growing season, which suggests the risk of a percentage of the corn crop is at risk of damage from an early frost. The U.S. corn crop is currently rated as having 13% in VPP condition and 57% in GE condition. Compared to 2018, the U.S. corn crop has 1% more in VPP condition and 11% less in GE condition (Table 4).

Table 4. Corn Crop Rating Comparison for the 2018 and 2019 Crop Years for the U.S. and Selected States.						
	Very Poor + Poor	Good + Excellent	Change in Very Poor + Poor	Change in Good + Excellent	2018 Yield	2019 Aug Yield
Illinois (#2)						
2018	5%	76%	+12%	-27%	210	181
2019	17%	49%				
Indiana (#5)						
2018	9%	70%	+18%	-38%	189	166
2019	27%	32%				
Iowa (#1)						
2018	8%	73%	+1%	-8%	196	191
2019	9%	65%				
Minnesota (#4)						
2018	7%	75%	+5%	-20%	182	173
2019	12%	55%				
Nebraska (#3)						
2018	6%	83%	+1%	-9%	192	186
2019	7%	74%				
Kentucky (#14)						
2018	9%	71%	+2%	-5%	175	181
2019	11%	66%				
U.S. 18-State Ranking						
2018	12%	68%	+1%	-11%	176.4	169.5
2019	13%	57%				

Source: USDA *Crop Progress* Report, August 25, 2019.

Table 5. Soybean Crop Rating Comparison for the 2018 and 2019 Crop Years for the U.S. and Selected States.						
	Very Poor + Poor	Good + Excellent	Change in Very Poor + Poor	Change in Good + Excellent	2018 Yield	2019 Aug Yield
Illinois (#2)						
2018	4%	75%	+11%	-25%	65	55
2019	15%	50%				
Indiana (#5)						
2018	9%	70%	+18%	-37%	58.5	50
2019	27%	33%				
Iowa (#1)						
2018	8%	70%	+1%	-8%	57	55
2019	9%	62%				
Minnesota (#4)						
2018	7%	72%	+1%	-12%	50.5	46
2019	8%	60%				
Nebraska (#3)						
2018	6%	81%	+0%	-8%	59	58
2019	6%	73%				
Kentucky (#14)						
2018	6%	75%	+5%	-11%	52	53
2019	11%	64%				
U.S. 18-State Ranking						
2018	11%	66%	+2%	-11%	51.6	48.5
2019	13%	55%				

Source: USDA *Crop Progress* Report, August 25, 2019.

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Source: USDA Crop Progress Report, August 25, 2019.

Table 5 provides the percentage of the 2019 soybean crop rated in VPP condition and GE condition as of August 25, 2019, with a comparison for the same period in 2018. The top-five soybean-producing states, Kentucky, and the U.S. soybean crop's condition are worse than the 2018 soybean crop. As in corn, the soybean crops east of the Mississippi River have a larger percentage in VPP condition and a smaller percentage in GE condition than in 2018 as compared to soybeans in states west of the Mississippi River.

Indiana, the fifth-largest soybean state, has 27% of the soybean crop rated in VPP condition and 33% rated in GE condition. Compared to 2018, Indiana has 18% more rated in VPP condition and 37% less rated in GE condition for Indiana soybeans. In contrast, Nebraska's soybeans are viewed to have 6% in VPP condition and 73% in GE condition for 2019. Compared to 2018, the VPP condition is the same as last year, and the percentage in GE condition is 11% smaller than last year.

The U.S. soybean crop is rated as having 13% in VPP condition and 55% in GE condition as of August 25, 2019. Compared to last year, the percentage in VPP condition has increased by 2% and the percentage rated in GE condition has decreased by 11%.

Table 6 reports the percentage of each state's corn crop at the dough stage compared to last week, last year, and the five-year average progress. The state production rankings are included behind the state name with the top-five corn-producing states shaded green. As of August 25, 2019, 71% of the U.S. corn crop was at the dough phase, which is 16% behind the five-year average and 20% (Table 6). Of the eighteen states surveyed, only Texas is ahead of the five-year average dough progress. The top-five corn states are all at least 10% behind the long-term average progress. Illinois, Indiana, Iowa, Minnesota, and Nebraska are 19%, 28%, 14%, 13%, and 10% behind their respective five-year average.

Table 7 reports the percentage of each state's corn crop at the dent stage compared to last week, last year, and the five-year average progress. As of August 25, 2019, 27% of the U.S. corn crop was at the dent phase, which is

19% behind the five-year average (Table 7). Of the eighteen states surveyed, only Texas is ahead of the five-year dent progress. Four of the top-five corn states are all at least 25% behind the long-term average progress. Illinois, Indiana, Iowa, and, Minnesota are 26%, 31%, 25%, and 29% behind their respective five-year average. Nebraska is only 13% behind the long-term average dent progress.

**Table 6. 2019 Corn Dough Progress Compared to the Previous Week, Previous Year, and the Five-Year Average.**

	Aug 25, 2018	Aug 18, 2019	Aug 25, 2019	2014-2018 Average	Change from 5-Year Average	Change from 2018
	%	%	%	%	%	%
COLORADO (15)	76	34	56	70	-14	-20
ILLINOIS (2)	97	55	75	94	-19	-22
INDIANA (5)	92	43	59	87	-28	-33
IOWA (1)	91	59	76	90	-14	-15
KANSAS (7)	91	72	84	89	-5	-7
KENTUCKY (14)	87	69	76	83	-7	-11
MICHIGAN (11)	73	30	45	71	-26	-28
MINNESOTA (4)	91	55	74	87	-13	-17
MISSOURI (10)	99	77	84	95	-11	-15
NEBRASKA (3)	93	61	80	90	-10	-13
NORTH CAROLINA (18)	97	95	97	97	+0	+0
NORTH DAKOTA (12)	91	18	47	75	-28	-44
OHIO (8)	88	37	52	83	-31	-36
PENNSYLVANIA (16)	74	47	62	66	-4	-12
SOUTH DAKOTA (6)	93	39	56	85	-29	-37
TENNESSEE (17)	99	93	96	97	-1	-3
TEXAS (13)	95	91	94	93	+1	-1
WISCONSIN (9)	75	31	48	70	-22	-27
18-States	91	55	71	87	-16	-20

Source: USDA *Crop Progress* Report, August 25, 2019.

**Table 7. 2019 Corn Dent Progress Compared to the Previous Week, Previous Year, and the Five-Year Average.**

	Aug 25, 2018	Aug 18, 2019	Aug 25, 2019	2014-2018 Average	Change from 5-Year Average	Change from 2018
	%	%	%	%	%	%
COLORADO (15)	23	3	10	25	-15	-13
ILLINOIS (2)	78	12	34	60	-26	-44
INDIANA (5)	57	7	17	48	-31	-40
IOWA (1)	60	7	21	46	-25	-39
KANSAS (7)	69	37	51	58	-7	-18
KENTUCKY (14)	69	47	57	66	-9	-12
MICHIGAN (11)	31	1	9	22	-13	-22
MINNESOTA (4)	42	1	7	36	-29	-35
MISSOURI (10)	87	27	43	74	-31	-44
NEBRASKA (3)	56	17	36	49	-13	-20
NORTH CAROLINA (18)	89	84	90	90	+0	+1
NORTH DAKOTA (12)	44		5	25	-20	-39
OHIO (8)	51	3	9	37	-28	-42
PENNSYLVANIA (16)	31	20	34	29	+5	+3
SOUTH DAKOTA (6)	53	2	7	32	-25	-46
TENNESSEE (17)	83	62	79	79	+0	-4
TEXAS (13)	87	80	86	77	+9	-1
WISCONSIN (9)	33	3	11	25	-14	-22
18-States	59	15	27	46	-19	-32

Source: USDA *Crop Progress* Report, August 25, 2019.

**Table 8. 2019 Soybean Pod Setting Progress Compared to the Previous Week, Previous Year, and the Five-Year Average.**

	Aug 18, 2018	Aug 11, 2019	Aug 18, 2019	2014-2018 Average	Change from 5-Year Average	Change from 2018
	%	%	%	%	%	%
Arkansas (#11)	98	85	91	96	-5	-7
ILLINOIS (#1)	99	67	79	94	-15	-20
Indiana (#4)	95	50	65	93	-28	-30
Iowa (#2)	96	71	84	94	-10	-12
Kansas (#10)	88	60	73	81	-8	-15
Kentucky (#15)	82	57	69	78	-9	-13
Louisiana (#17)	100	98	100	99	+1	+0
Michigan (#13)	89	47	65	91	-26	-24
Minnesota (#3)	98	87	94	96	-2	-4
Mississippi (#12)	97	87	91	94	-3	-6
Missouri (#7)	84	53	65	77	-12	-19
Nebraska (#5)	95	78	83	94	-11	-12
North Carolina (#18)	73	64	73	74	-1	+0
North Dakota (#9)	99	78	89	96	-7	-10
Ohio (#6)	94	54	70	92	-22	-24
South Dakota (#8)	96	59	73	94	-21	-23
Tennessee (#16)	94	73	83	88	-5	-11
Wisconsin (#14)	93	64	73	92	-19	-20
18-States	94	68	79	91	-12	-15

Source: USDA *Crop Progress* Report, August 25, 2019.

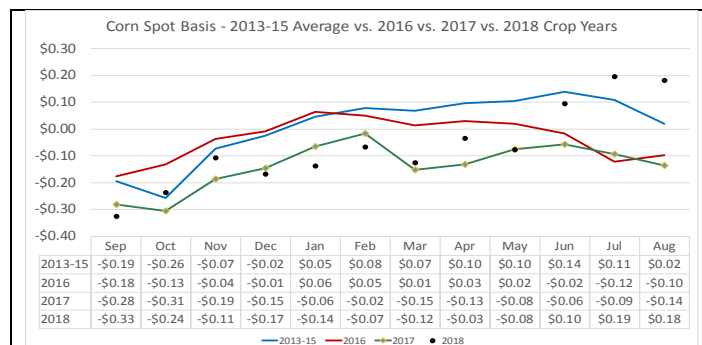
Table 8 provides an update of the 2019 soybean progress at setting pods. As of August 25, 79% of the U.S. soybean crop is setting pods, which is 12% behind the 5-year average progress for this date and 15% behind last year's progress. The top-five soybean-producing states, shaded green, are running 15% (Illinois), 28% (Indiana), 10% (Iowa), 2% (Minnesota), and 11% (Nebraska) behind their respective five-year average blooming progress. Michigan, Ohio, and Wisconsin are also 26%, 22% and 19% behind, respectively, their five-year average blooming progress. Soybeans produced in the Delta are slightly behind the five-year average but are close to being average of the 18-states surveyed weekly by NASS.

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

Figure 7, Figure 8, and Figure 9 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 triangles in Figure 9 represents the 2019 basis for wheat.

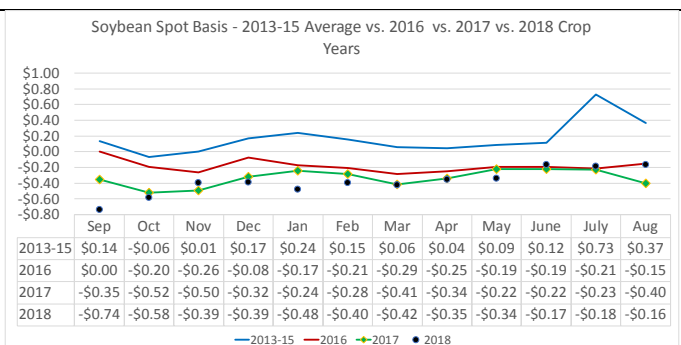
The corn basis is \$0.18/bushel over the September corn contract, which is a \$0.42/bushel increase from harvest in October. Last year, the corn basis appreciated from October to August by \$0.17/bushel, which was \$0.14/bushel higher than the amount of appreciation in basis for the 2016 corn crop from harvest to August (Figure 7).

The average soybean basis, as of August 23, 2019, was  $-\$0.16$ /bushel under the September 2019 soybean contract. The basis is  $\$0.24$  per bushel narrower than 2017 basis and  $\$0.01$  per bushel narrower than the 2016 basis (Figure 8). Last year, the basis appreciated  $\$0.12$ /bushel from October to August, but the 2016 crop's basis had an appreciation in the basis of  $\$0.05$ /bushel from harvest to August. Current basis appreciation for the 2018 crop is  $\$0.42$ /bushel from October to August (Figure 8).



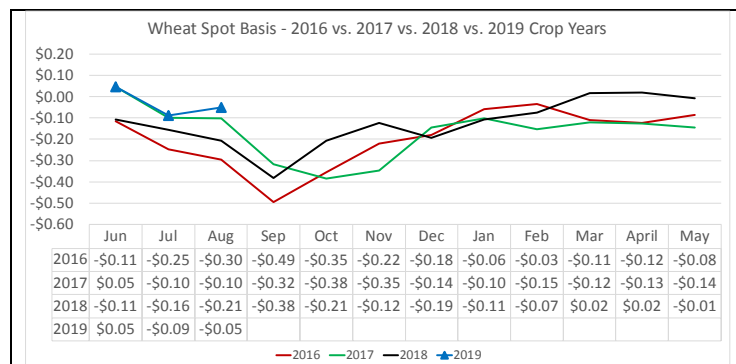
**Figure 7. Western Kentucky Corn Spot Market Basis Appreciation from September to August for the 2013 to 2018 Crop Years.**

Basis Calculated on August 23, 2019



**Figure 8. Western Kentucky Soybean Spot Market Basis Appreciation from September to August for the 2013 to 2018 Crop Years.**

Basis Calculated on August 23, 2019



**Figure 9. Western Kentucky Wheat Spot Market Basis Appreciation from June to May for the 2016 to 2019 Crop Years.**

Basis Calculated on August 23, 2019

The average wheat spot basis has been strengthening since January 2019. The average basis for the 2018 crop (black line) has been narrower than the 2017 crop and is stronger than the basis for the 2016 wheat crop.

The 2019 wheat basis is  $-\$0.05$ /bushel below the September futures contract. Seasonality suggests that basis will widen into the fall. However, the stronger basis than previous years might limit the extent of basis depreciation into the fall.

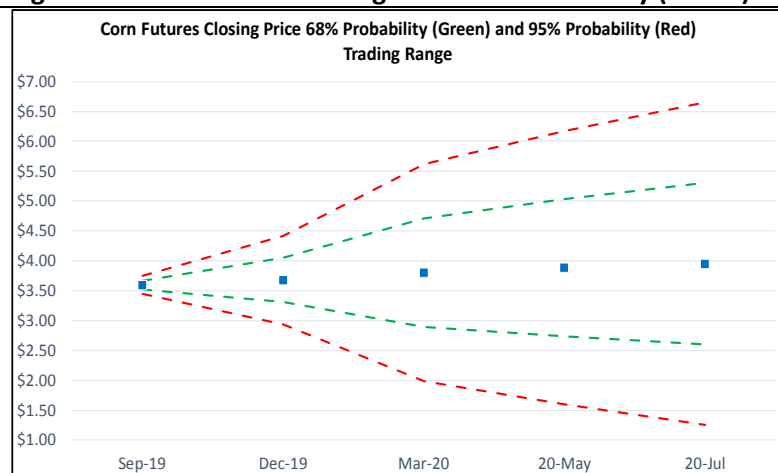
## Topic 6. Projected Corn, Soybean, and Wheat Futures Trading Ranges to July 2020

Figures 10–12 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 2020. That is because there is more time until the contract's expiration; thus, there is a wider potential trading range for these deferred futures contracts.

Figure 10 provides the probabilistic trading range for the corn futures contracts from September 2019 to July 2020. There is a 68% probability that the December 2019 corn contract will trade between  $\$3.31$  and  $\$4.05$  and a 95% probability that the December 2019 corn contract will trade between  $\$2.94$  and  $\$4.42$ . Managers considering storing corn into 2020 should monitor the March 2020 contract, which has a 68% probability of trading between  $\$2.89$  and  $\$4.71$  per bushel. The July 2020 corn contract has a 68% probability of trading between  $\$2.60$  and  $\$5.30$  per bushel (Figure 10).



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

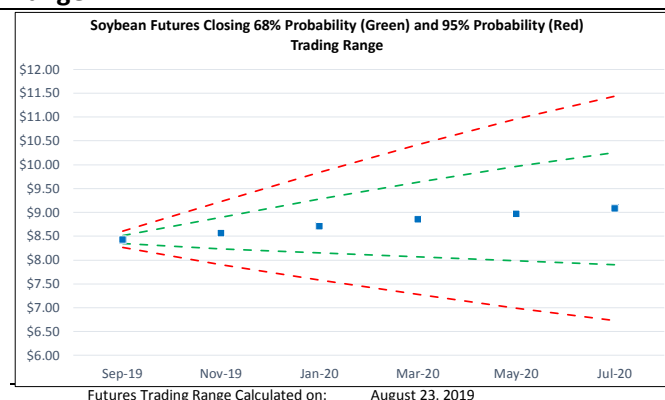


Futures Trading Range Calculated on: August 23, 2019

Trading range calculated on August 23, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on August 23, 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 soybean futures contracts from September 2019 to July 2020. The November 2019 futures contract has a 68% probability of trading between \$8.23 and \$8.90 per bushel (Figure 11). The increased volatility in the soybean market contributes to this wide range in possible soybean prices for the new-crop soybean futures contracts. Managers planning to store soybeans into the new-year should monitor the March 2020 soybean contract. The March 2020 contract has a 68% probability of trading between \$8.07 and \$9.64 per bushel. The July 2020 soybean contract has a 68% probability of trading between \$7.91 and \$10.26 per bushel (Figure 11).

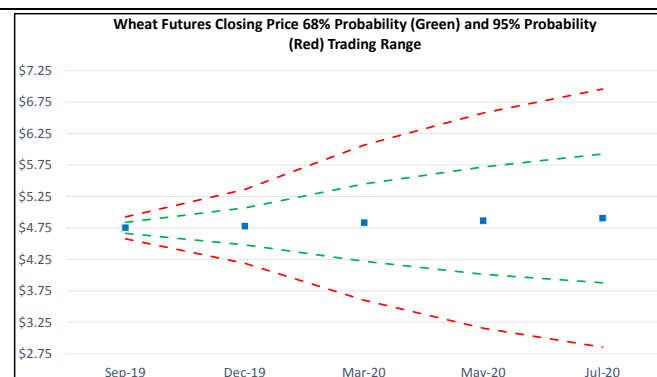
**Figure 11. Soybean Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.**



Futures Trading Range Calculated on: August 23, 2019

Trading range calculated on August 23, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on August 23, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

**Figure 12. Wheat Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.**



Futures Trading Range Calculated on: August 23, 2019

Trading range calculated on August 23, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on August 23, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 12 provides the probabilistic trading range for wheat futures contract from September 2019 to July 2020 contracts. The September 2019 wheat contract has a 68% chance of trading between \$4.67 and \$4.84. Similarly, the December 2019 wheat contract has a 68% chance of trading between \$4.48 and \$5.07/bushel, which should be monitored for managing 2019 wheat that is planned to be stored. The July 2020 Futures contract has a 68% probability of trading between \$3.88 and \$5.93 per bushel and should be considered as a tool to manage price risk for producers planning on seeding wheat for 2020 (Figure 12).

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

Tables 9-11 analyze the effectiveness of using hedging with futures, put options, and cash forward contracts in protecting revenue that covers total input costs, cash rent, overhead and family living for corn, soybeans, and double-crop soybeans in 2019.

Table 9 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 \$3.68/bushel assuming a \$0.00/bushel harvest-time basis. The second is to lock in a cash price with a forward contract at \$3.69/bushel. The third alternative is to establish a price floor at \$3.54/bushel by buying a put option with a \$3.70 strike price that costs \$0.157.

Yield	150	160	170	180	190	200
TVC+Rent+Overhead+Family Living (\$/acre)	\$704	\$704	\$704	\$704	\$704	\$704
TVC+Rent+Overhead+Family Living (\$/bu)	\$4.69	\$4.40	\$4.14	\$3.91	\$3.71	\$3.52
Hedge @ \$3.68+ -\$0.00 basis = \$3.68	-\$1.02	-\$0.72	-\$0.46	-\$0.23	-\$0.03	+\$0.16
Forward Contract at \$3.69	-\$1.01	-\$0.71	-\$0.46	-\$0.23	-\$0.02	+\$0.17
Put: \$3.70 strike @ \$0.157 = \$3.54 floor	-\$1.15	-\$0.86	-\$0.60	-\$0.37	-\$0.16	+\$0.02
Strategies Evaluated on:	August 23, 2019					

Table 9 demonstrates that risk management opportunities have waned as the crop approaches maturity and harvest. If managers are trying to lock in a profit above total economic costs and family living, yields will have to exceed 190-bushels (Table 9).

Table 10 illustrates the risk management potential for full-season soybeans. The November 2019 soybean contract has been trading lower by \$0.73/bushel since June 2019. Current prices are not providing an opportunity to lock in a return over total economic costs plus family living for yields less than 65 bushels/acre. A carry-in of 1 billion bushels will limit pricing opportunities for soybeans to be sold at harvest unless the production loss is much larger than currently estimated.

Yield	45	50	55	60	65
TVC+Rent+Overhead+Family Living (\$/acre)	\$522	\$522	\$522	\$522	\$522
TVC+Rent+Overhead+Family Living (\$/bu)	\$11.60	\$10.44	\$9.49	\$8.70	\$8.03
Hedge @ \$8.57+ -\$0.50 basis = \$8.07	-\$3.54	-\$2.38	-\$1.43	-\$0.64	+\$0.03
Forward Contract at \$8.16	-\$3.44	-\$2.28	-\$1.33	-\$0.54	+\$0.13
Put: \$8.60 strike @ \$0.233 = \$7.87 floor	-\$3.73	-\$2.57	-\$1.62	-\$0.83	-\$0.16
Strategies Evaluated on:	August 23, 2019				

Yield	35	40	45	50	55
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 @ \$8.57+ -\$0.50 basis = \$8.07	-\$3.15	-\$1.75	-\$0.66	+\$0.22	+\$0.93
Forward Contract at \$8.16	-\$3.05	-\$1.65	-\$0.56	+\$0.31	+\$1.02
Put: \$8.60 strike @ \$0.233 = \$7.87 floor	-\$3.35	-\$1.95	-\$0.86	+\$0.02	+\$0.73
Strategies Evaluated on:	August 23, 2019				

The market is providing an opportunity to protect double-crop soybean risk for those that typically harvest 50-bushel double-crop soybeans or better. Given the fundamental weakness for soybeans, managers should consider pricing a percentage of double-crop soybean production that will be sold at harvest as fundamentals are limiting upside price potential (Table 11).

## Topic 8. 2019 Projected Return to Storage for Corn and Soybeans

Table 12 provides projected returns to on-farm and commercial corn storage from harvest to the following August. The return to on-farm storage is calculated as the deferred price less the harvest price less the monthly opportunity cost less the on-farm storage fee. The harvest price for corn is projected at \$3.43 per bushel. The annual interest rate is 5%, which gives a monthly interest cost of \$0.0143/bushel for corn. The corn futures complex closing prices on August 23, 2019, and the five-year average monthly spot basis are used to forecast the most-likely deferred cash prices. The maximum monthly basis is the optimistic basis, and the minimum basis is the pessimistic basis. On-farm storage is charged \$0.127 per bushel, and the return to on-farm storage is the return to the farm's drying and storage system.

The projected return to on-farm corn storage, assuming the most likely basis, is \$0.19/bushel in January 2020. The combination of average basis appreciation and carry in the futures market provides even larger projected returns to on-farm storage into spring 2020 (Table 12).

The return to commercial corn storage is the deferred price less the harvest price, interest costs, and commercial storage fees. Commercial storage is assumed at \$0.20/bushel from harvest to January 31, with an additional \$0.05/bushel per month starting in February. The projected commercial storage return is \$0.12/bushel in January assuming the most-likely basis and the current carry in the futures market. Commercial storage returns decline when the additional monthly charge begins in January.

If the 2019 corn crop is reduced further, basis appreciation may be greater than that modeled by the most likely basis. The optimistic return to on-farm and commercial storage for corn to January 2020 is \$0.30/bushel and \$0.23/bushel, respectively (Table 12).

<b>Table 12. Projected Return to Storage for On-Farm and Commercial for Corn.</b>									
Harvest Cash Price		\$3.43							
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
On-Farm Storage Cost (\$/bu)		\$0.14	\$0.16	\$0.17	\$0.18	\$0.20	\$0.21	\$0.23	\$0.24
Commercial Storage (\$/bu)		\$0.21	\$0.23	\$0.24	\$0.31	\$0.37	\$0.44	\$0.50	\$0.56
Most Likely Spot Price Forecast (\$/bu)		\$3.60	\$3.73	\$3.79	\$3.82	\$3.87	\$3.90	\$3.97	\$4.00
Conservative Spot Forecast (\$/bu)		\$3.49	\$3.63	\$3.66	\$3.73	\$3.73	\$3.75	\$3.87	\$3.90
Optimistic Spot Forecast (\$/bu)		\$3.74	\$3.87	\$3.90	\$3.87	\$3.98	\$4.01	\$4.11	\$4.10
Returns to On-Farm Storage		+\$0.03	+\$0.14	+\$0.19	+\$0.21	+\$0.24	+\$0.26	+\$0.31	+\$0.33
Conservative		-\$0.08	+\$0.05	+\$0.07	+\$0.12	+\$0.11	+\$0.12	+\$0.22	+\$0.23
Optimistic		+\$0.17	+\$0.28	+\$0.30	+\$0.26	+\$0.36	+\$0.37	+\$0.46	+\$0.43
Returns to Commercial Storage		-\$0.04	+\$0.07	+\$0.12	+\$0.09	+\$0.07	+\$0.04	+\$0.04	+\$0.01
Conservative		-\$0.15	-\$0.02	-\$0.01	+\$0.00	-\$0.06	-\$0.11	-\$0.05	-\$0.09
Optimistic		+\$0.10	+\$0.21	+\$0.23	+\$0.14	+\$0.18	+\$0.15	+\$0.19	+\$0.11
<b>Projected on August 23, 2019.</b>									

<b>Table 13. Projected Return to Storage for On-Farm and Commercial for Soybeans.</b>									
Harvest Cash Price		\$8.52							
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
On-Farm Storage Cost (\$/bu)		\$0.16	\$0.20	\$0.23	\$0.27	\$0.30	\$0.34	\$0.38	\$0.41
Commercial Storage (\$/bu)		\$0.34	\$0.37	\$0.41	\$0.49	\$0.53	\$0.56	\$0.60	\$0.63
Most Likely Spot Price Forecast (\$/bu)		\$8.63	\$8.74	\$8.85	\$8.85	\$8.89	\$8.92	\$9.06	\$9.11
Conservative Spot Forecast (\$/bu)		\$8.34	\$8.45	\$8.49	\$8.57	\$8.67	\$8.74	\$8.85	\$8.97
Optimistic Spot Forecast (\$/bu)		\$8.93	\$9.00	\$9.15	\$9.18	\$9.24	\$9.24	\$9.44	\$9.43
Returns to On-Farm Storage		-\$0.05	+\$0.02	+\$0.10	+\$0.06	+\$0.06	+\$0.06	+\$0.16	+\$0.18
Conservative		-\$0.34	-\$0.27	-\$0.26	-\$0.22	-\$0.16	-\$0.12	-\$0.04	+\$0.04
Optimistic		+\$0.25	+\$0.28	+\$0.40	+\$0.39	+\$0.42	+\$0.38	+\$0.54	+\$0.50
Returns to Commercial Storage		-\$0.23	-\$0.15	-\$0.07	-\$0.16	-\$0.16	-\$0.17	-\$0.06	-\$0.04
Conservative		-\$0.51	-\$0.44	-\$0.43	-\$0.44	-\$0.38	-\$0.35	-\$0.26	-\$0.18
Optimistic		+\$0.08	+\$0.11	+\$0.23	+\$0.17	+\$0.20	+\$0.16	+\$0.32	+\$0.28
<b>Projected on August 23, 2019.</b>									

The projected on-farm and commercial storage returns for soybeans are presented in Table 13. The harvest price for soybeans is projected at \$8.52 per bushel, with a monthly interest cost of \$0.0355/bushel. The five-year average monthly spot basis is used to forecast the most-likely deferred cash prices. The maximum monthly basis is the optimistic basis, and the minimum basis is the pessimistic basis. On-farm storage is charged \$0.127 per bushel, and the return to on-farm storage is the return to the farm's storage system.

Assuming the most likely basis and the current carry in the soybean futures market, the return to on-farm storage is \$0.10/bushel in January 2020 (Table 13). Soybean basis has been wider than average for the 2017 and 2018 crops, so the conservative basis suggests a return to on-farm storage of -\$0.26/bushel in January. The optimistic returns might be too optimistic given recent basis appreciation and market fundamentals.

The return to commercial soybean storage is the deferred price less the harvest price, interest costs, and commercial storage fees. Commercial storage is assumed at \$0.30/bushel from harvest to January 31, with an additional \$0.05/bushel per month starting in February. The projections in Table 13 suggest no opportunity for positive returns to commercial storage for the most likely and conservative basis assumptions.

## Topic 9. Post-Harvest 2019 Corn and Soybean Risk Management Opportunities

Managers storing corn and soybeans to February 2020 may want to consider if the futures or options markets are providing opportunities to protect prices at profitable levels. Table 14 compares the potential of using hedging, forward contracts, or put options to lock in a return over total economic costs, family living, and on-farm storage.

Table 14. Western Kentucky Corn Storage Risk Management to February 2020 for Various Yield Objectives.					
Yield	<u>170</u>	<u>180</u>	<u>190</u>	<u>200</u>	Those farms that produced more than 190-bushel corn may be able to lock-in a profit above total budgeted costs. Farms with lower expected yields do not have profitable risk management opportunities at current prices (Table 14).
TVC+Rent+Overhead+Family Living (\$/acre)	\$704	\$704	\$704	\$704	
TVC+Rent+Overhead+Family Living (\$/bu)	\$4.14	\$3.91	\$3.71	\$3.52	
TVC+Rent+OH+Family+\$0.21 storage (\$/bu)	\$4.35	\$4.12	\$3.92	\$3.73	
CFC @ \$3.87	-\$0.49	-\$0.26	-\$0.05	+\$0.14	
Hedge @ \$3.80+\$+0.05 basis = \$3.85	-\$0.50	-\$0.27	-\$0.07	+\$0.12	
Put: \$3.80 strike @\$0.185 = \$3.67 floor	-\$0.69	-\$0.46	-\$0.25	-\$0.07	
Strategies Evaluated on:		August 23, 2019			

Table 15 presents risk management alternatives for storing soybeans from harvest to February 2020. The example varies the harvested yield to illustrate how the break-even price over inputs, rent, overhead, family living, and storage changes with yield.

Table 15. Western Kentucky Soybean Storage Risk Management to February 2019 for Various Yield Objectives.					
Storage Hedge: Feb 2020		Soybeans			
Yield		<u>40</u>	<u>50</u>	<u>60</u>	<u>70</u>
TVC+Rent+Overhead+Family Living (\$/acre)		\$522	\$522	\$522	\$522
TVC+Rent+Overhead+Family Living (\$/bu)		\$13.05	\$10.44	\$8.70	\$7.46
TVC+Rent+OH+Family+\$0.27 storage (\$/bu)		\$13.32	\$10.76	\$9.02	\$7.78
Hedge @ \$8.85 + -\$0.30 basis = \$8.55		-\$4.77	-\$2.21	-\$0.47	+\$0.77
Forward Contract at \$8.70		-\$4.62	-\$2.06	-\$0.32	+\$0.92
Put: \$8.80 strike @\$0.305 = \$8.20 floor		-\$5.13	-\$2.57	-\$0.82	+\$0.42
Strategies Evaluated on:		August 23, 2019			

The example illustrates that a yield of 70-bushels is needed to lock in a profit using the futures market or forward contracts. Table 15 also illustrates that farmers harvesting lower yields will be challenged to find profitability at current prices and the assumed costs.

## Topic 10. Potential 2019-20 Corn and Soybean Stocks-to-Use and Price Potential

The August series of reports released on August 12 did not answer as many questions as anticipated by farmers and analysts. Future reports will adjust the estimated harvested area and yield for both crops. The late-planted corn crop might have a lower test weight, which will affect yield, the feeding efficiency, and ethanol processing efficiency. A crop with lower quality will also affect exports.

Tables 16 and 17 provide a matrix of potential U.S. corn and soybeans ending stocks-to-use ratios, respectively, for varying harvested area and yields. The objective of Tables 16 and 17 are to identify what acreage and yields might support higher corn and soybean U.S. MYA farm prices.

Let us start the discussion with the potential U.S. 2019-20 corn ending stocks in Table 16. Table 16 assumes a harvested area of 82 million acres from the August report with a reduction of 2 million and 3 million harvested acres from the August estimate. The matrix also assumes the August projected yield of 169.5-bushels with lower yields of 165-bushels and 162-bushels.

Table 16 is a matrix of potential ending stocks-to-use ratios for the 2019-20 corn market, assuming carry-in plus imports of 2.41 billion bushels from the August WASDE. Total use is held constant at 14.130 billion bushels, which is the total use from the August WASDE. The 2019-20 stocks-to-use ratio could be 10.5% if the harvested area is 80 million acres, and the yield is 165 bushels/acre. A 10.5% stocks-to-use ratio suggests the U.S. MYA farm price would be \$4.10/bushel, or \$0.50/bushel higher than the August 2019 estimate. A yield of 162 bushels/acre and harvested area of 79 million acres suggests a stocks-to-use ratio of 7.6% and a U.S. MYA farm price of \$4.75/bushel. A stocks-to-use ratio near 5% would increase the corn price to a level where demand would decline and market dynamics would adjust towards a final stock-to-use ratio closer to 7%.

The story from Table 16 is that the futures price could adjust higher if there is some concern of stocks declining steadily. If a price bump occurs, it could be fleeting, and managers should be prepared to take advantage of pricing opportunities. The yield and acreage uncertainty will likely be debated all fall and into the final report in January. Therefore, a pricing opportunity may not materialize for the December 2019 contract, but instead for a deferred contract. Vigilance is necessary to monitor pricing opportunities for the 2019 crops as well as opportunities for the December 2020 corn futures contract.

**Table 16. Projected 2019-20 U.S. Corn Stocks-to-Use Ratios for Varying Harvested Areas and Yields Assumptions.**

Ending Stocks (Million Bushels)				Stocks-to-Use Ratio			
Harvested	Yield (bu/acre)			Harvested	Yield (bu/acre)		
Area (million)	162	165	169.5	Area (million)	162	165	169.5
82	1,564	1,810	2,179	82	11.1%	12.8%	15.4%
80	1,240	1,480	1,840	80	8.8%	10.5%	13.0%
79	1,078	1,315	1,671	79	7.6%	9.3%	11.8%

Source: USDA-World Agricultural Outlook Board and Author's Projections.

**Table 17. Projected 2019-20 U.S. Soybean Stocks-to-Use Ratios for Varying Harvested Areas and Yields Assumptions.**

Ending Stocks (Million Bushels)				Stocks-to-Use Ratio			
Harvested	Yield (bu/acre)			Harvested	Yield (bu/acre)		
Area (million)	44	46	48.5	Area (million)	45	46	48.5
76.5	440	593	784	76.5	11.0%	14.8%	19.5%
75.9	414	565	755	75.9	10.3%	14.1%	18.8%
75.3	387	538	726	75.3	9.6%	13.4%	18.1%

Source: USDA-World Agricultural Outlook Board and Author's Projections.

Table 17 provides a similar analysis for the 2019-20 soybean ending stocks-to-use ratio and potential U.S. MYA farm price. The 75.9 million harvested acres from the August report is adopted along with the area that is 600 thousand acres higher or lower. The matrix uses the projected yield of 48.5 bushels/acre along with yields for 44 and 46 bushels/acre.

Table 17 assumes a carry-in plus imports of 1.09 billion bushels and total soybean use of 4.016 billion bushels. These estimates are from the August WASDE. If the harvested area is 75.9 million acres and the yield is 46 bushels/acre, the stocks-to-use ratio could decrease to 14.1%, which would correspond to a \$9.20/bushel U.S. MYA farm price. For comparison, a farm price of \$9.20 per bushel is \$0.80/bushel higher than the projections from the August report. Any combination of harvested area and yield that reduces the stocks-to-use ratio below 10% will provide the opportunity for \$10/bushel soybeans. However, current fundamentals suggest it is unlikely to reach 10% this year.

The takeaway message from Table 17 is that there could be a more bullish story to tell for soybeans. However, the production loss is not likely to be significant enough to mitigate the impact of a 1.07 billion bushel carry-in. The bearish risk for the soybean market is that production might not decline significantly or even increase slightly from the August estimate.

The soybean market needs a production loss to whittle away at the mountain of stocks. Otherwise, the market will muddle through with lower prices to stimulate use and discourage production. The price dynamics needed to reduce soybean stocks to levels achieved before the trade dispute would require multiple crop years and planted area to decline further from that planted in 2019. Mother Nature might be providing a quicker route to lower stocks and higher soybean prices. However, any solution provided by Mother Nature will only last one year as a trend or above trend crop will increase stocks unless the demand side of the balance sheet is improved.

## Topic 11. Upcoming Grain Outlook and Risk Management Webinars


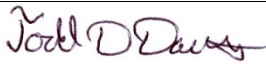

A series of one-hour market outlook and risk management webinars will be held monthly to update managers on the USDA reports and risk management opportunities for corn, soybean, and wheat. The webinars will be delivered via Zoom. Contact your local Extension agent for login information for each month's webinar. The dates and start times are listed below.



- September 19, 2019 — 8:30 am Central
- October 28, 2019 — 8:30 am Central
- November 14, 2019 — 8:30 am Central
- December 17, 2019 — 8:30 am Central

## Topic 12. How Do I Get on the Email Distribution List to Receive this Newsletter?

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