

Crops Marketing and Management Update

Grains and Forage Center of Excellence

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Vol. 2019 (4)

April 29, 2019

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Topic 1. Prospective Plantings Report: Corn Area Increases while Soybean and Wheat Declines

USDA released the 2019 *Prospective Plantings* report on March 29 with analysts expecting corn area to increase by 2.1 million acres and soybean planted area to decrease by 3 million acres from last year. The surprise was corn area increasing by 1.6 million acres and soybean area to decrease by 1.6 million acres more than projected by analysts.

Figure 1. Change in U.S. Corn Planted Area from 2018 to 2019 (1,000 Acres) for Selected States.

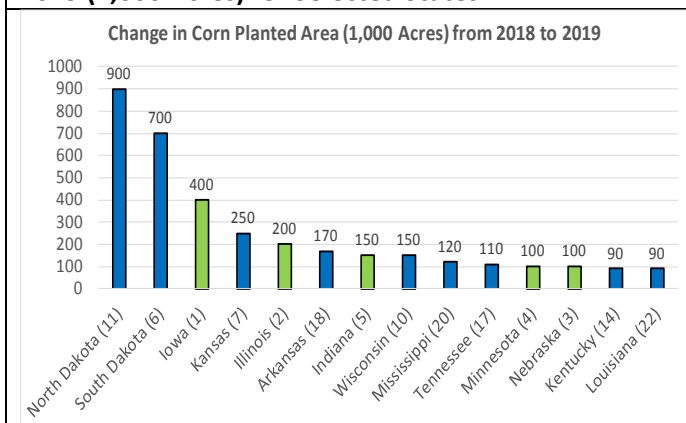


Figure 2. 2019 Corn Trend Yield and % of Iowa's 2019 Trend Yield for Selected States.

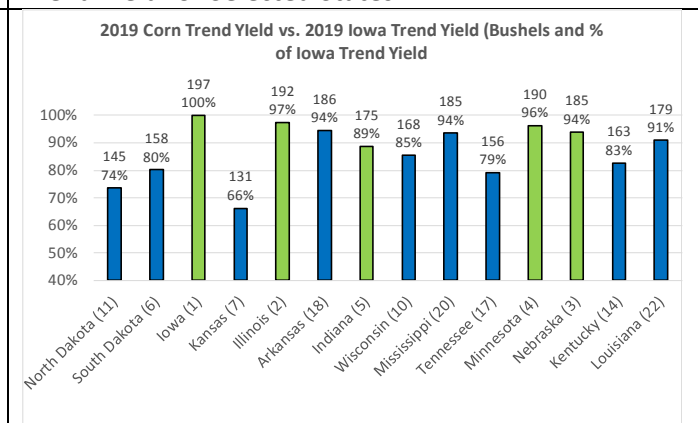
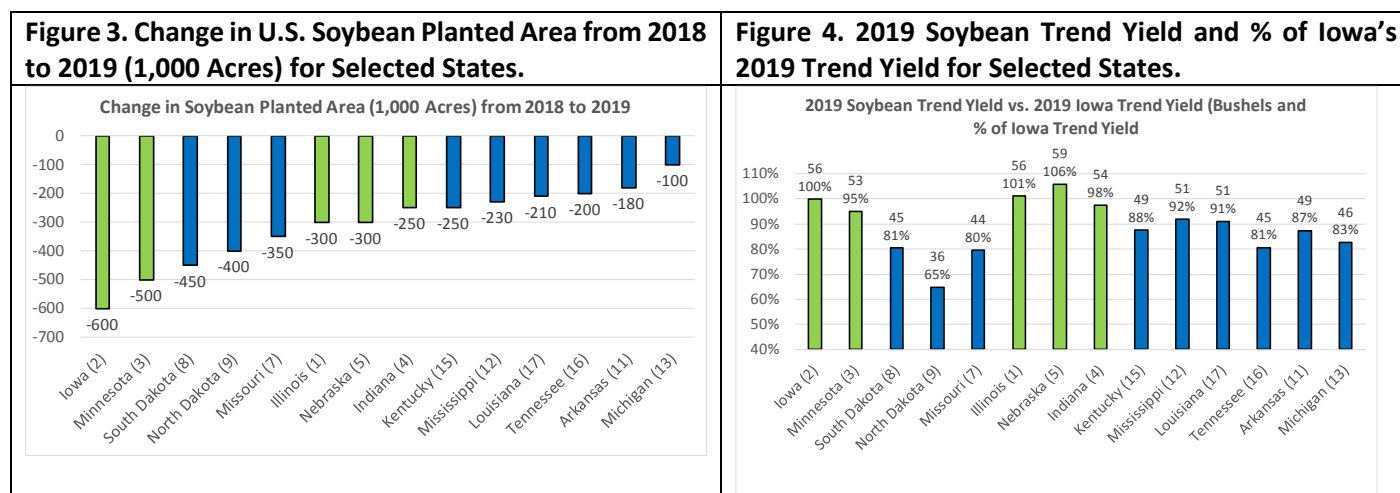


Figure 1 shows the change in projected corn area from 2018 sorted by the largest increase. North Dakota and South Dakota, the 11th and 6th ranked corn-producing states, are expected to increase the planted area by 900 and 700 thousand acres, respectively from last year. The increase in corn area in North Dakota, South Dakota, and Iowa accounts for 54% of the projected area increase. The top-five corn-producing states, shaded green, accounts for 26% of the projected increase in corn area from last year.

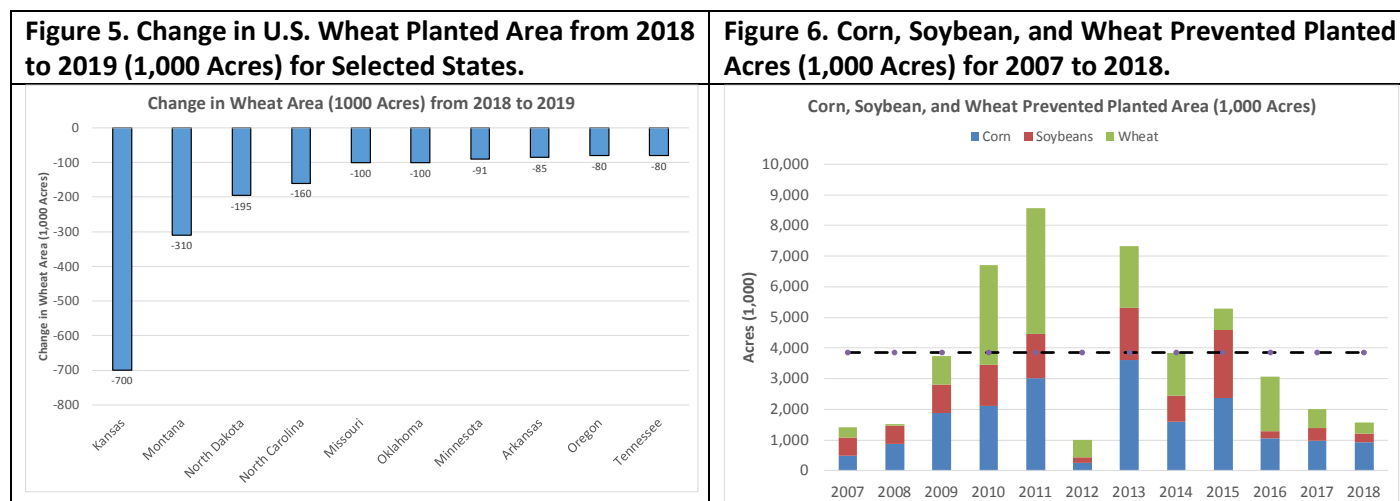
Figure 2 shows the 2019 trend yields and the percentage of each state's trend yield compared to Iowa's trend yield. Figure 2 illustrates that the increase in corn area is mostly occurring in areas with yield potential substantially below that of the core-producing region. This suggests the 2019 U.S. corn yield may not be significantly above trend because of the increase in area in less productive areas unless the growing season is ideal.

Figure 3 shows the change in projected soybean area from 2018 sorted by the largest decrease. Iowa, Minnesota, and South Dakota accounts for 34% of the reduced soybean area. Also, the top-five soybean producing states, shaded green, accounts for 43% of the total decrease in the planted area from 2018. This is in contrast to corn, which had most of the area change in states outside of the core region.

Figure 4 shows the 2019 trend yields and the percentage of each state's trend yield compared to Iowa's yield. Figure 4 illustrates that the decrease in corn area is occurring in a significant area with the greatest yield potential. The market wants reduced production, and Figure 4 illustrates that reducing planted soybean area in the high-yielding states may provide what the market is asking for – a smaller soybean crop.



Analysts surveyed before the report's release expected wheat area to decline by 900 thousand acres from 2018. The report indicates that farmers plan to reduce the total wheat seeded area by 2 million acres from 2018, which would be the smallest planted area on record if realized. The survey projects the largest reduction in wheat area in Kansas, Montana, and North Dakota with a 700, 310, and 195 thousand acre decrease, respectively (Figure 5).



Kentucky farmers indicated that they planned to increase corn area by 90 thousand acres to a projected 1.43 million acres, but planned to reduce soybean area by 250 thousand acres to an expected 1.75 million acres for 2019. Total Kentucky wheat area is expected to be unchanged from 2018 at 450 thousand acres.

As always, Mother Nature will dictate what is planted. Figure 6 illustrates the total corn, soybean, and wheat area prevented from being planted each year for the 2007 to 2018 crops. The average prevented planted area for the three crops is 3.8 million acres for the 2007 to 2018 crops. Of course, the average year does not exist. The amount prevented has been as many as 8.5 million acres in 2011 to as few as 1 million acres in 2012. The area prevented from being planted has been below-average for the last three crop years with the corn and soybean area ranging from 1.2 to 1.4 million acres. For comparison, the corn and soybean prevented area in 2010, 2011, and 2013 was 3.4, 4.5, and 5.3 million acres, respectively. Wet soil conditions may push prevented area closer to those experienced in 2010-2011.

Typically, corn composes 37% of the failed area followed by wheat at 29%, and soybeans at 21% for the 2007 to 2018 crop years. For these years, the largest percentage of prevented acres occurred in North Dakota with 17% of the prevented acres reported to FSA. South Dakota was second with 12% of the prevented acres. Recall that the largest increase in corn plantings is expected in North and South Dakota. Prevented plantings may be an issue that limits the planned expansion in corn in this region.

The market will continue to trade weather, wrestle over the issue of timely planting of corn, and consider if acres will be switched to soybeans or filed as prevented planting. Stay tuned for the *Acreage* survey released on June 29 that will report updated statistics of what farmers planted in 2019.

Topic 2. April WASDE Report Shows Increasing Corn and Wheat Stocks

The April WASDE tends to focus on demand and the size of the South American crops. Analysts surveyed before the report expected corn stocks to increase by 178 million bushels from March and soybean stocks to increase slightly (13 million bushels) from last month's estimates.

As expected USDA increased corn stocks by 200 million bushels from the previous report. USDA reduced corn used in ethanol by 50 million bushels reflecting the slower pace of ethanol crush. Exports were trimmed by 75 million bushels reflecting that U.S. corn is becoming less competitive in the export market due to South American harvest. USDA reduced corn for feed use by 75 million bushels (Table 1)

Ending corn stocks are projected at 2.035 billion bushels (Table 1). If realized, 2018 ending corn stocks will decline by 105 million bushels from 2017. This reduction in inventories will support a higher U.S. marketing-year average (MYA) price of \$3.55 per bushel.

Table 1. U.S. Corn Supply and Use.						Table 2. U.S. Soybeans Supply and Use.					
	2015-16	2016-17	2017-18 Estimated	2018-19 Projected	Change from 17-18		2015-16	2016-17	2017-18 Estimated	2018-19 Projected	Change from 17-18
Planted Area (million)	88.0	94.0	90.2	89.1	-1.1	Planted Area (million)	82.7	83.4	90.2	89.2	-1.0
Harvested Area (million)	80.8	86.7	82.7	81.7	-1.0	Harvested Area (million)	81.7	82.7	89.5	88.1	-1.4
Yield (bushels/acre)	168.4	174.6	176.6	176.4	-0.2	Yield (bushels/acre)	48	52	49.3	51.6	+2.3
----- Million Bushels -----						----- Million Bushels -----					
Beginning Stocks	1,731	1,737	2,293	2,140	-153	Beginning Stocks	191	197	302	438	+136
Production	13,602	15,148	14,609	14,420	-189	Production	3,926	4,296	4,412	4,544	+132
Imports	67	57	36	40	+4	Imports	24	22	22	17	-5
Total Supply	15,401	16,942	16,939	16,600	-339	Total Supply	4,140	4,515	4,735	4,999	+264
Feed and Residual	5,131	5,472	5,304	5,300	-4	Crushings	1,886	1,901	2,055	2,100	+45
Food, Seed & Industrial	6,635	6,883	7,056	6,965	-91	Exports	1,936	2,174	2,129	1,875	-254
Ethanol and by-products	5,206	5,432	5,605	5,500	-105	Seed	97	105	104	98	-6
Exports	1,898	2,293	2,438	2,300	-138	Residual	24	34	9	31	+22
Total Use	13,664	14,649	14,799	14,565	-234	Total Use	3,944	4,213	4,297	4,104	-193
Ending Stocks	1,737	2,293	2,140	2,035	-105	Ending Stocks	197	302	438	895	+457
Stocks/Use	12.7%	15.7%	14.5%	14.0%	-0.5%	Stocks/Use	5.0%	7.2%	10.2%	21.8%	+11.6%
Days of Stocks	46	57	53	51	-2	Days of Stocks	18	26	37	80	+42.4
U.S. Marketing-Year Average Price (\$/bu)	\$3.61	\$3.36	\$3.36	\$3.55	+\$0.19	U.S. Marketing-Year Average Price (\$/bu)	\$8.95	\$9.47	\$9.33	\$8.60	-\$0.73

The April report updated the corn production estimates for Argentina and Brazil. The 2018-planted corn crop is projected at 1.85 and 3.78 billion bushels in Argentina and Brazil, respectively, and is 39 and 59 million bushels larger than the March report. This would be a 590 and 551 million bushel increase over the 2017-corn crop, respectively.

USDA surprised the market by reducing soybean stocks slightly from the March report. USDA reduced projected imports by 3 million bushels and increased seed use by 2 million bushels for a net reduction in stocks by 5 million bushels (Table 2). USDA projects 2018-19 soybean ending stocks at 895 million bushels. USDA did not adjust the U.S. MYA soybean price from the previous month keeping it at \$8.60/bushel. If realized, the 2018-19 MYA price would be \$0.73/bushel less than the 2017-18 MYA price (Table 2).

USDA did not adjust the size of the 2018-planted soybean crop in Argentina from the March report but did increase Brazil's soybean crop by 18 million bushels. USDA projects the Argentine soybean crop at 2 billion bushels and the Brazilian crop at 4.3 billion bushels. If realized, the Argentine crop will be 632 million bushels larger than in 2017 while the Brazilian soybean crop will be 184 million bushels smaller than the 2017 crop.

Table 3. U.S. Wheat Supply and Use.					
	2015-16	2016-17	2017-18	2018-19	Change from
			Estimated	Projected	17-18
Planted Acres (million)	55.0	50.1	46.1	47.8	+1.7
Harvested Acres (million)	47.3	43.9	37.6	39.6	+2.0
Yield (bushels/acre)	43.6	52.7	46.4	47.6	+1.2
----- Million Bushels -----					
Beginning Stocks	752	976	1,181	1,099	-82
Production	2,062	2,309	1,741	1,884	+143
Imports	113	118	157	145	-12
Total Supply	2,927	3,402	3,079	3,128	+49
Food	957	949	964	965	+1
Seed	67	61	63	62	-1
Feed and Residual	152	156	51	70	+19
Exports	775	1,055	901	945	+44
Total Use	1,952	2,222	1,980	2,042	+62
Ending Stocks	976	1,181	1,099	1,087	-12
Stocks/Use	50.0%	53.2%	55.5%	53.2%	-2.3%
Days of Stocks	183	194	203	194	-8
U.S. Marketing-Year Average Price (\$/bu)	\$4.89	\$3.89	\$4.72	\$5.20	+\$0.48

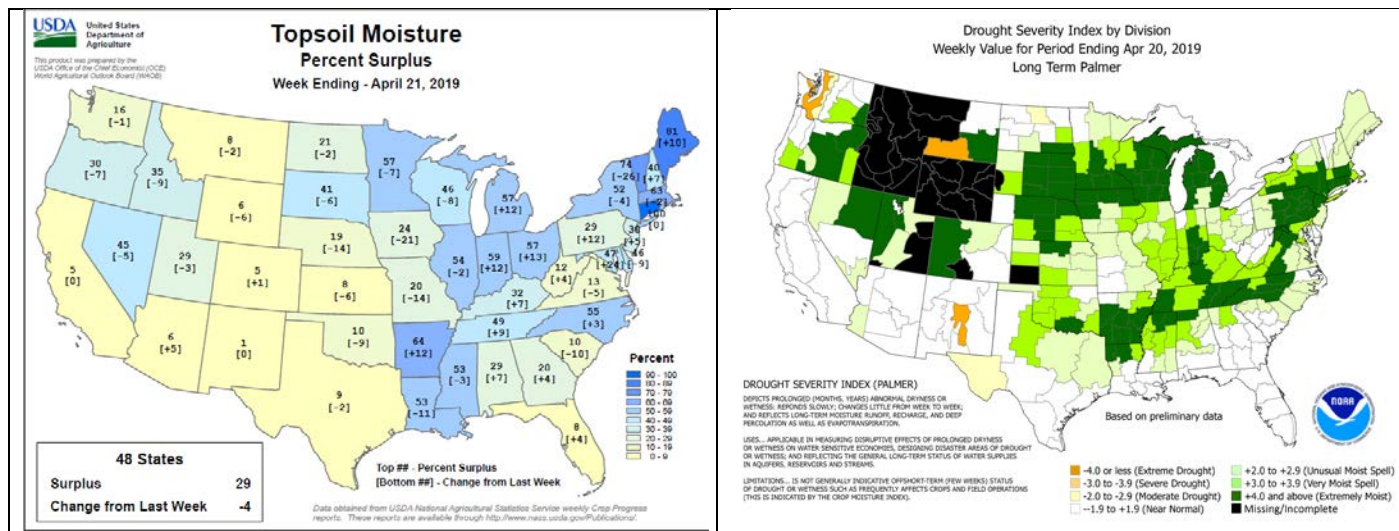
Source: April 2019 WASDE - USDA: WAOB.

USDA made minor adjustments to the wheat supply and demand estimates. USDA decreased seed by 1 million bushels from the previous month. USDA also reduced wheat for food use by 10 million bushels and exports by 20 million bushels. The net impact on stocks is a 32 million bushel increase from the March report.

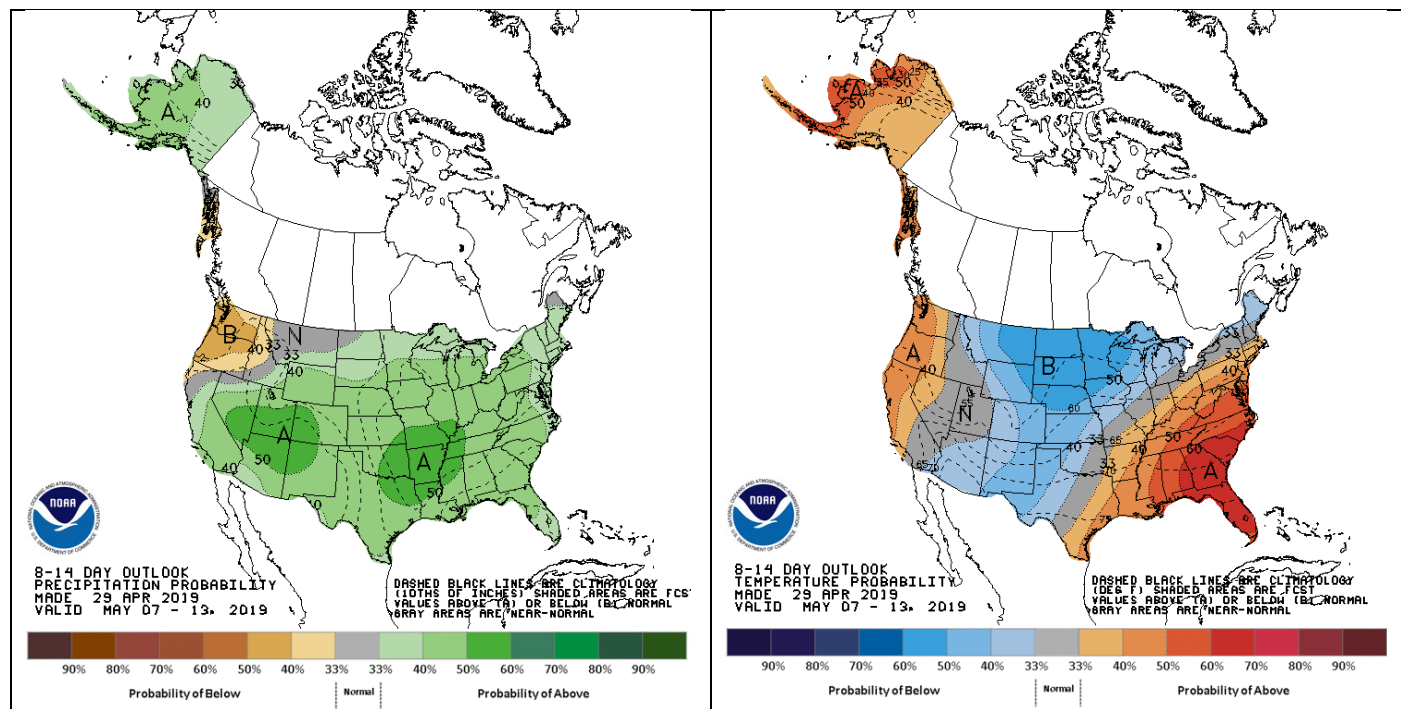
If realized, wheat stocks could shrink by 12 million bushels from last year. The days of stocks are projected at 194 days, which is an 8-day reduction in inventories from last year. The U.S. MYA price is expected to increase by \$0.48/bushel to \$5.20/bushel for 2018-19.

Topic 3. Soil Moisture and Short-Term Precipitation and Temperature Outlook

The market is monitoring planting progress, which is being delayed by excess soil moisture. The percent surplus moisture in the topsoil (left map below) shows that three of the top-five corn states (IL, IN, and MN) have more than 50% of the fields surveyed with excess moisture. Iowa and Nebraska have a lower percentage of excess moisture. The long-term Palmer drought map (right map below) is another way to illustrate the excess moisture in the Corn Belt and Delta regions.



The 8 to 14-day precipitation (below left) and temperature (below right) outlooks suggest a rainy and cool start to May in the core producing states with above-average probabilities of precipitation limiting planting process. As the planting season enters May, the market will pay closer attention to weather events that delay planting and potentially contributes to prevented plantings or switching from corn to soybeans.



Topic 4. 2019 Corn and Soybean Planting Progress and 2019 Wheat Condition

The 18-states surveyed for corn planting progress (Table 4) are all at or running behind the 5-year average process as of the week ending April 29, 2019. Illinois and Minnesota are 34% and 22% behind the 5-year average while Indiana, Ohio, and South Dakota are 15%, 11%, and 11% behind their respective 5-year average planting rate, respectively. The rest of the states are 10% behind or less the average planting rate. The U.S. corn crop is projected to be 12% behind the 5-year average (Table 4).

Table 4. Corn Planting Progress for 2018 Compared to Last Week, Last Year, and the Five-Year Average.

	% April 8		% April 15		% April 22		% 29-Apr		April 29 Average 2014-18
Colorado	0	0	0	0	2	2	8	8	14
Illinois	0	0	0	0	1	1	9	9	43
Indiana	0	1	0	1	1	1	2	2	17
Iowa	0	0	0	0	4	4	21	21	26
Kansas	2	6	0	6	17	17	31	31	36
Kentucky	2	8	0	8	17	17	28	28	31
Michigan	0	0	0	0	0	0	2	2	5
Minnesota	0	0	0	0	0	0	2	2	24
Missouri	2	6	0	6	16	16	45	45	55
Nebraska	0	0	0	0	2	2	16	16	23
North Carolina	5	18	0	18	28	28	53	53	68
North Dakota	0	0	0	0	0	0	1	1	1
Ohio	0	0	0	0	1	1	2	2	13
Pennsylvania	0	0	0	0	0	0	5	5	8
South Dakota	0	0	0	0	0	0	0	0	11
Tennessee	8	16	0	16	24	24	41	41	50
Texas	53	57	0	57	59	59	65	65	65
Wisconsin	0	0	0	0	1	1	4	4	8
18 States	2	3	0	3	6	6	15	15	27

Source: USDA Crop Progress Report, April 29, 2019.

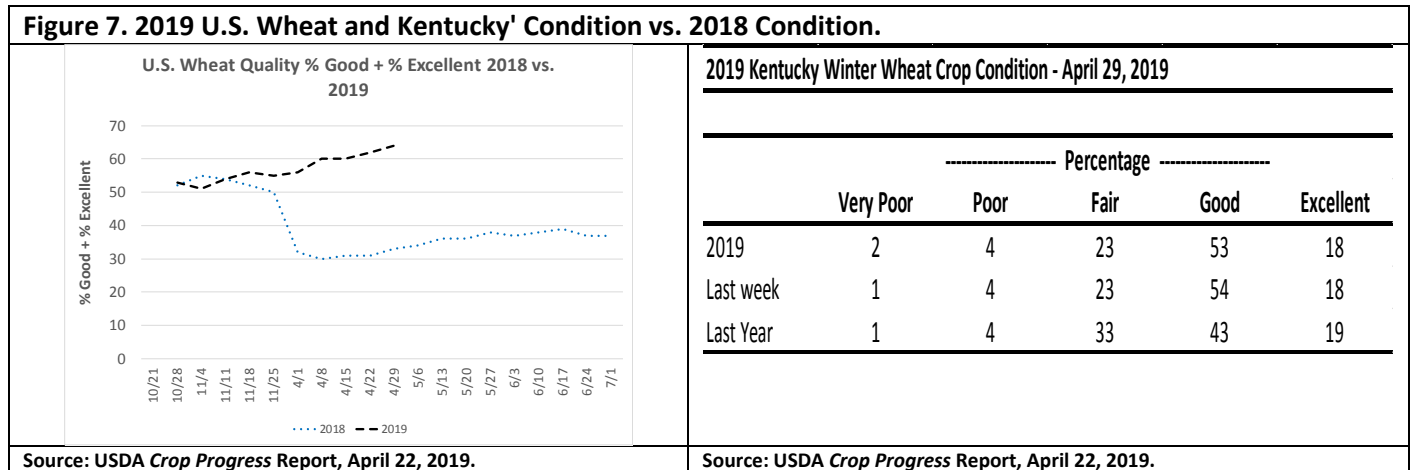
Table 5. Corn Emergence for 2018 Compared to Last Week, Last Year, and the Five-Year Average.

	% April 22		% 29-Apr		April 29 Average 2014-18
Arkansas	6	6	10	10	26
Illinois	0	0	3	3	6
Indiana	0	0	0	0	4
Iowa	0	0	3	3	3
Kansas	0	0	2	2	2
Kentucky	1	1	4	4	2
Louisiana	16	16	24	24	43
Michigan	0	0	2	2	1
Minnesota	0	0	0	0	3
Mississippi	16	16	20	20	41
Missouri	0	0	2	2	4
Nebraska	0	0	3	3	5
North Carolina	0	0	5	5	2
North Dakota	0	0	0	0	1
Ohio	0	0	1	1	3
South Dakota	0	0	0	0	1
Tennessee	1	1	3	3	4
Wisconsin	0	0	0	0	1
18 States	1	1	3	3	6

Source: USDA Crop Progress Report, April 29, 2019.

NASS has just started to survey soybean planting progress for the week ending April 22 and shows a slow start for the 2019 crop (Table 5). Arkansas, Louisiana, and Mississippi are 16%, 19%, and 21% behind their respective five-year average planting progress. Most of the states surveyed are less than 5% behind their average planting progress.

Figure 7 shows the percentage of the U.S. wheat crop rated in good or excellent condition in 2019 as compared to the percentage for 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 condition with 64% rated in good to excellent condition. Kentucky's winter wheat crop is currently rated at 72% good to excellent condition as compared to 66% in 2018.



Topic 5. Suitable Field Days and Statistical U.S. Corn Planting Capacity

The slow start to planting combined with a forecast of wet weather may spark the question of how many suitable field days are needed to plant the U.S. corn crop. Figure 8 shows the average number of field days per week (blue line) for the 18-states surveyed by NASS for the 2014-18 crop years. The gray area is the range in field days for each week. The red line in Figure 8 is the number of suitable field days for 2019. While the corn planting season is just starting, the 2019 season's number of field days was below-average until the week ending April 29.

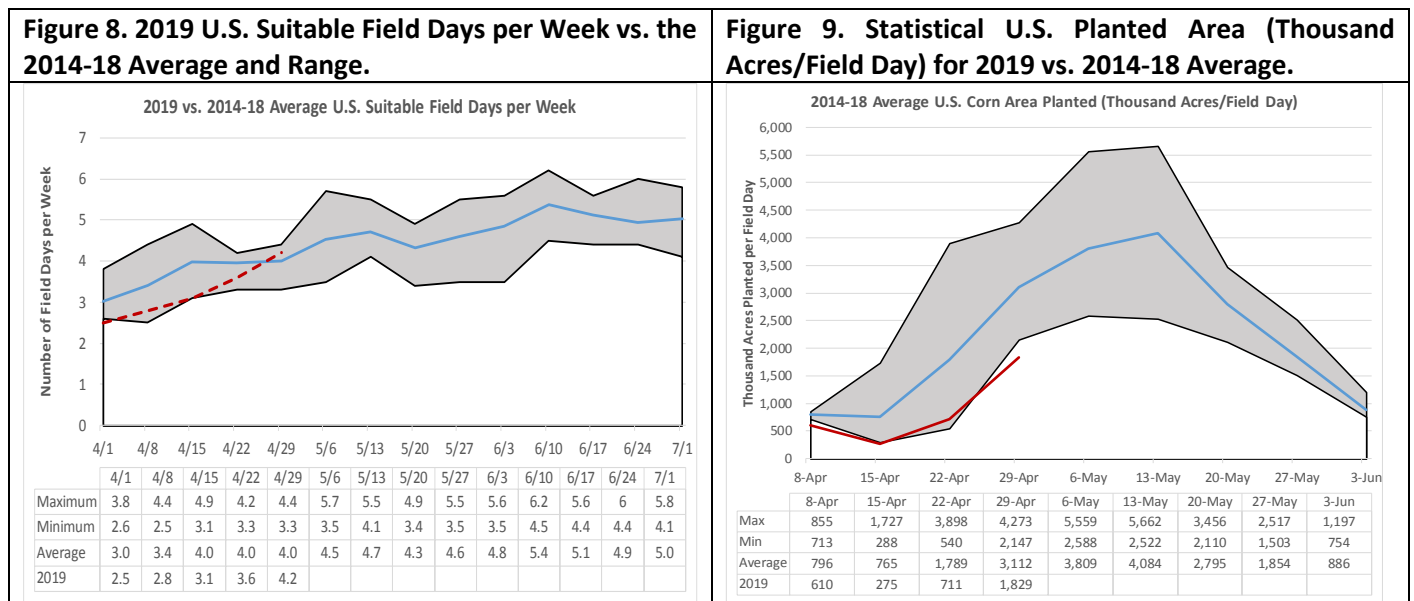


Figure 9 is the calculated corn acres planted per each suitable field day as reported by NASS. The planting rate is calculated using the corn planting progress from NASS and the planted area for each year from 2014-18 to determine the acres planted per week. Then the amount planted per field day is calculated using the suitable field day data in Figure 8. Figure 9 shows that planting capacity ramps up in May to an average of 3.8 million acres per field day for the first week to over 4 million acres per field day by mid-May. The red line in Figure 9 shows planting rates below average

and near the minimum for the 2014-18 crop years. Figure 9 shows the tremendous planting capacity available if the weather improves. However, if planting progress remains below average combined with wet weather forecasts, the market will focus more on prevented planting or switching acreage from corn to soybeans.

Topic 6. 2018 Corn, Soybean, Wheat Basis vs. Previous Years – Implications for Storage

Figure 10, Figure 11, and Figure 12 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 corn basis is $-\$0.04$ /bushel under the May corn contract, which is a $\$0.20$ /bushel increase from harvest in October. Last year, the corn basis appreciated from October to April by $\$0.17$ /bushel, which was a penny higher than the amount of appreciation in basis for the 2016 corn crop (Figure 10).

The average soybean basis, as of April 26, 2019, was $-\$0.36$ /bushel under the May 2019 soybean contract. The basis is $\$0.02$ per bushel wider than 2017 basis and $\$0.11$ per bushel wider than the 2016 basis (Figure 11). Last year, the basis appreciated $\$0.28$ /bushel from October to January, but the 2016 crop's basis had a maximum appreciation in the basis of $\$0.12$ /bushel in December. Basis appreciation will be necessary for positive returns to soybean storage with current appreciation at $\$0.20$ /bushel from October to April (Figure 11).

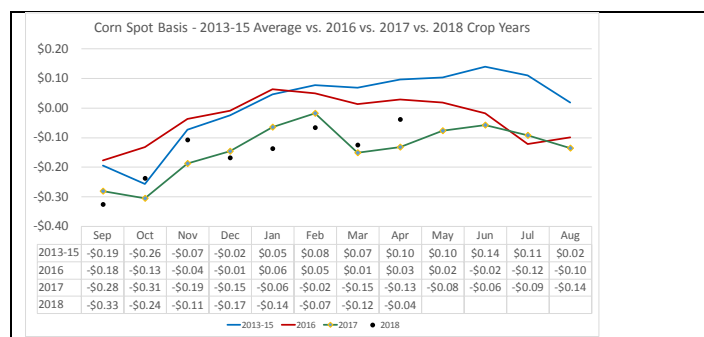


Figure 10. Western Kentucky Corn Spot Market Basis Appreciation from September to August for 2013 to 2018 Crop Years.

Basis Calculated on April 26, 2019

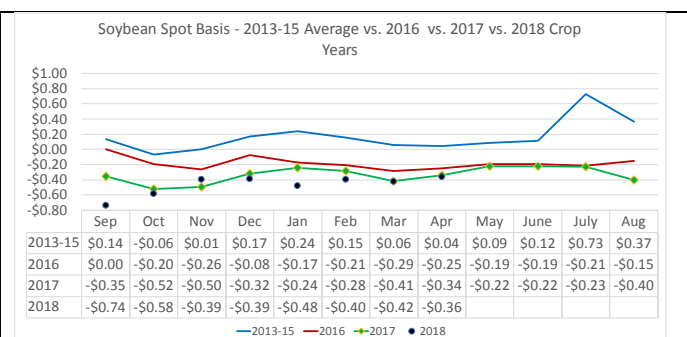


Figure 11. Western Kentucky Soybean Spot Market Basis Appreciation from September to August for 2013 to 2018 Crop Years.

Basis Calculated on April 26, 2019

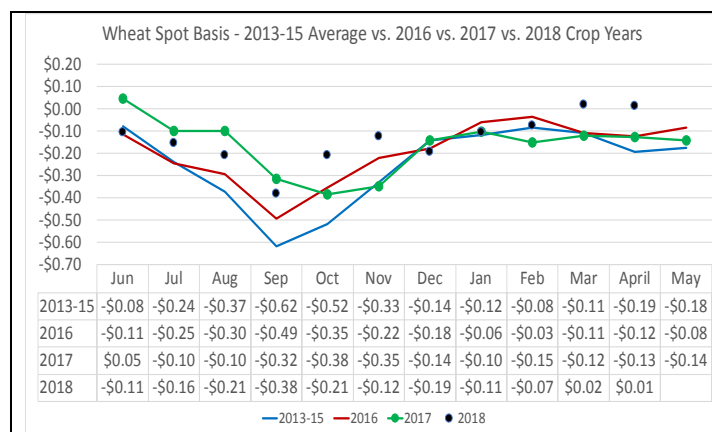


Figure 12. Western Kentucky Wheat Spot Market Basis Appreciation from June to May for 2013 to 2018 Crop Years.

Basis Calculated on April 26, 2019

The average appreciation in wheat basis was $\$0.15$ /bushel from harvest to February for the 2013-15 crop years. The average appreciation in the basis for the 2016 crop year was $\$0.21$ /bushel from harvest to February. Maximum appreciation was $\$0.00$ /bushel in January for the 2017 crop (Figure 12).

The 2018 wheat basis is currently at $+\$0.01$ / bushel above the May contract. The spot basis is stronger than the most recent years. Basis should be monitored for opportunities to lock in a strong basis for wheat being stored.

Topic 7. Projected Corn, Soybean, and Wheat Futures Trading Ranges to December 2019

Figures 13–15 provide the projected futures price trading range, by futures contract month, based on the contracts' volatility for the previous 21-day period. The green lines represent the range that describes the 68% probability of the projected trading range with the red line representing 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 13. Corn Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.

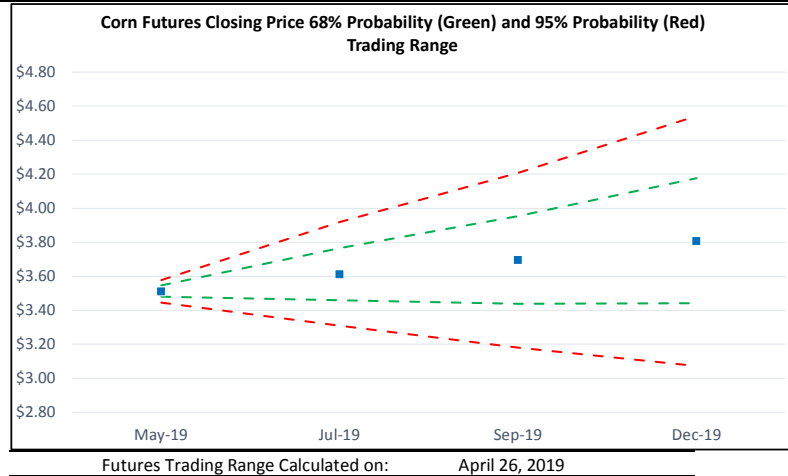
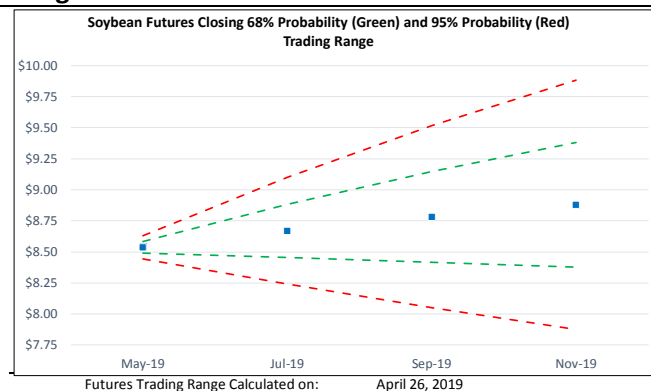


Figure 13 provides the probabilistic trading range for the corn futures contracts from May 2019 to December 2019. There is a 68% probability that the May 2019 corn contract will trade between \$3.48 and \$3.55 and a 95% probability that the May 2019 corn contract will trade between \$3.45 and \$3.58 (Figure 13). 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 \$3.44 and \$4.17 per bushel.

Trading range calculated on April 26, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on April 26, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

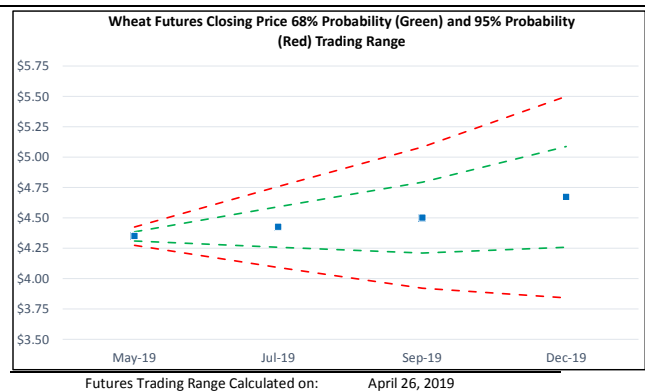
Figure 14 provides the probabilistic trading range for soybean futures contracts from May 2019 to November 2019. The May 2019 soybean futures have a 68% probability of trading between \$8.49 to \$8.58 with a 95% likelihood of trading between \$8.44 and \$8.63. The November 2019 futures contract has a 68% probability of trading between \$8.38 and \$9.38 per bushel (Figure 14). The increased volatility in the soybean market contributes to this wide range in possible soybean prices for the new-crop soybean futures contracts.

Figure 14. Soybean Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on April 26, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on April 26, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 15. Wheat Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on April 26, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on April 26, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 15 provides the probabilistic trading range for wheat futures contract from May 2019 to December 2019 contracts. The July 2019 wheat futures contract has a 68% probability of trading between \$4.26 and \$4.59 per bushel with a 95% chance of trading between \$4.09 and \$4.76/bushel (Figure 15). The December 2019 wheat contract has a

68% chance of trading between \$4.26 and \$5.09/bushel, which should be monitored for managing 2019 wheat that is planned to be stored. Similarly, the July 2020 Futures contract closed at \$4.97 on April 26 and should be considered as a tool to manage price risk for producers planning on seeding wheat for 2020.

Topic 8. Pre-Harvest 2019 Corn, Soybean, and Wheat Risk Management Opportunities

Tables 6-9 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, wheat, and double-crop soybeans in 2019.

Table 6 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 \$3.51/bushel assuming a -\$0.30/bushel harvest-time basis. The second is to lock in a cash price with a forward contract at \$3.58/bushel. The third alternative is to establish a price floor at \$3.27/bushel by buying a put option with a \$3.80 strike price that costs \$0.227.

Yield	160	170	180	190	200	210	The corn market currently offers risk management opportunities for the 2019 crop if the farm routinely harvests corn yields above 200 bushels, as hedging with futures or cash forward contracts may lock in a positive return over input costs, rent, overhead, and family living.
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 @ \$3.8125+ -\$0.30 basis = \$3.51	-\$0.68	-\$0.43	-\$0.21	-\$0.01	+\$0.16	+\$0.32	
Forward Contract at \$3.58	-\$0.61	-\$0.36	-\$0.14	+\$0.05	+\$0.23	+\$0.39	
Put: \$3.80 strike @\$0.227 = \$3.27 floor	-\$0.91	-\$0.67	-\$0.45	-\$0.25	-\$0.08	+\$0.08	
Strategies Evaluated on:	April 29, 2019						

Table 7 illustrates the potential of using risk management products to lock in a profitable return on input costs, cash rent, overhead and family living for 2019 soybeans if managers routinely obtain yields of 65 bushels/acre or more. Managers that are comfortable with hedging with futures or using HTA contracts may be able to lock in a profit of \$0.18/bushel assuming a harvest-time basis of -\$0.50/bushel under the November 2019 contract. A forward contract could lock in a return of \$0.20/bushel for a yield of 65 bushels/acre (Table 7).

Yield	45	50	55	60	65	The soybean market is not offering risk management opportunities for yields of less than 65 bushels/acre. Given the uncertainty in the soybean market, managers should monitor opportunities to manage risk when they are available.
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 @ \$8.8075 + -\$0.50 basis = \$8.31	-\$3.43	-\$2.25	-\$1.29	-\$0.49	+\$0.18	
Forward Contract at \$8.32	-\$3.41	-\$2.24	-\$1.28	-\$0.48	+\$0.20	
Put: \$8.80 strike @\$0.403 = \$7.90 floor	-\$3.84	-\$2.66	-\$1.70	-\$0.90	-\$0.23	
Strategies Evaluated on:	April 29, 2019					

Yield	60	70	80	90	100	Table 8 reports the potential of using risk management to lock in a profitable return on inputs, one-half of cash rent, overhead, and family living expense for 2019 winter wheat. The decline in the July 2019 futures contract has removed any potential of using risk management tools to protect positive returns on a percentage of production.
TVC+50% Rent+Overhead+Family Living (\$/acre)	\$476	\$476	\$476	\$476	\$476	
TVC+50% Rent+Overhead+Family Living (\$/bu)	\$7.93	\$6.80	\$5.95	\$5.29	\$4.76	
Hedge @ \$4.3525 - \$0.10 basis = \$4.25	-\$3.68	-\$2.55	-\$1.70	-\$1.04	-\$0.51	
Forward Contract at \$4.35	-\$3.63	-\$2.50	-\$1.65	-\$0.99	-\$0.46	
Put: \$4.35 strike @\$0.165 = \$4.08 floor	-\$3.85	-\$2.72	-\$1.87	-\$1.20	-\$0.68	
Strategies Evaluated on:	April 29, 2019					

Table 9. Risk Management Alternatives for 2019 Western Kentucky Double-Crop Soybeans for Various Yield Objectives.

Yield	35	40	45	50	55	The soybean market is offering risk management opportunities for double-crop yields of 50 bushels/acre or larger. Given the uncertainty in the soybean market, managers should monitor opportunities to manage risk when they are available.
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 @ \$8.8075 + -\$0.50 basis = \$8.31	-\$2.91	-\$1.51	-\$0.41	+\$0.46	+\$1.17	
Forward Contract at \$8.32	-\$2.89	-\$1.49	-\$0.40	+\$0.47	+\$1.18	
Put: \$8.80 strike @ \$0.403 = \$7.90 floor	-\$3.32	-\$1.92	-\$0.83	+\$0.05	+\$0.76	
Strategies Evaluated on:	April 29, 2019					

Topic 9. Comparison of Hedging Corn and Soybeans in May for Fall Delivery.

The January 2019 newsletter discussed the seasonality of the December corn and November soybeans future contracts and when the contracts tended to trade in the top 1/3 and bottom 1/3 of each year's trading range. While there is no silver bullet marketing strategy, both contracts tended to trade in the top 1/3 about 55% of the days for corn and 49% of the days for soybeans in May. This article discusses how the December corn and November soybean contracts change from the average May price to the harvest-time price in October for the 2000 to 2018 crop years.

Table 10. Change in the December Corn Futures from the May Average to the October Average Price for the 2000 to 2018 Crops.

Year	\$/Bushel Change from May to Harvest	% Change from May to Harvest	Summary Statistics for Change in December Corn Futures from May to Harvest		
				\$/bushel	% Change
2000	-\$0.53	-21%	Average	-\$0.24	-6%
2001	-\$0.10	-5%	Maximum	\$2.27	44%
2002	\$0.28	12%	Minimum	-\$2.13	-34%
2003	-\$0.18	-7%	% of Years Change is Less than Zero	74%	74%
2004	-\$0.90	-31%	Average when less than Zero	-\$0.64	-15%
2005	-\$0.28	-12%	% of Years Change is Greater than Zero	26%	26%
2006	\$0.29	11%	Average when Greater than Zero	\$0.90	22%
2007	-\$0.17	-5%			
2008	-\$2.13	-34%			
2009	-\$0.70	-16%			
2010	\$1.60	42%			
2011	-\$0.25	-4%			
2012	\$2.27	44%			
2013	-\$1.01	-19%			
2014	-\$1.36	-28%			
2015	\$0.05	1%			
2016	-\$0.47	-12%			
2017	-\$0.39	-10%			
2018	-\$0.51	-12%			

The left side of Table 10 shows the dollar per bushel change in price from May to October as well as the percentage change. The years where price declines from May planting to fall harvest are shaded green indicating that hedging would have provided price protection as compared to doing nothing. The summary statistics are provided in the right side of the table. The average change is -\$0.24/bushel (-6%) and prices tend to decline for about 74% of the years. The average price change when the price declines is -\$0.64/bushel (-15%). The price increased from May to October occurred for 26% of the years. The average increase in price for those years is \$0.90/bushel (+22%). The summary statistics include two extreme price events. The largest increase of \$2.27/bushel (+44%) occurred during the 2012 drought. The largest price decrease of -\$2.13/bushel occurred during the 2008 financial crisis.

Table 11 provides a similar analysis for the November soybean futures contract for the 2000 to 2018 crop years. The years where prices were lower in October than in May are highlighted in green and represent years when hedging would have been effective in protecting price. The average price change from May to October was -\$0.26/bushel (-

2%). Soybeans had a lower price at harvest 58% of the years analyzed. The average price change for the years with lower prices was $-\$1.33/\text{bushel}$ (-13%). The average change in price for the years when the price increased from May to October was $+\$1.20/\text{bushel}$ (+15%). The largest increase in the futures contract price was $+\$2.36/\text{bushel}$ (+30%) which occurred during the 2010 crop year. The largest decrease of $-\$3.79/\text{bushel}$ (-29%) and occurred during the 2008 financial crisis (Table 11).

Table 11. Change in the November Futures from the May Average to the October Average Price for the 2000 to 2018 Crops.

Year	\$/Bushel Change from May to Harvest	% Change from May to Harvest	Summary Statistics for Change in November Soybean Futures from May to Harvest		
				\$/bushel	% Change
2000	$-\\$0.90$	-16%	Average	$-\$0.26$	-2%
2001	$\$0.06$	1%	Maximum	$\$2.36$	30%
2002	$\$0.78$	17%	Minimum	$-\$3.79$	-29%
2003	$\$1.70$	30%	% of Years Change is Less than Zero	58%	58%
2004	$-\\$1.99$	-27%	Average when less than Zero	$-\$1.33$	-13%
2005	$-\\$0.59$	-9%	% of Years Change is Greater than Zero	42%	42%
2006	$-\\$0.26$	-4%	Average when Greater than Zero	$\$1.20$	15%
2007	$\$1.70$	21%			
2008	$-\\$3.79$	-29%			
2009	$-\\$0.34$	-3%			
2010	$\$2.36$	26%			
2011	$-\\$1.26$	-9%			
2012	$\$2.22$	17%			
2013	$\$0.54$	4%			
2014	$-\\$2.68$	-22%			
2015	$-\\$0.40$	-4%			
2016	$-\\$0.67$	-6%			
2017	$\$0.20$	2%			
2018	$-\\$1.72$	-17%			

Tables 10 and 11 do not consider the impact of margin calls. The years with large price increases where hedging would not have worked would have been accompanied by margin calls. These margin calls may impact a farm's cash resources and ability to cash flow farm business expenses during the growing season. Farmers considering hedging should talk with their lenders to discuss the lender's ability and willingness to finance margin calls for bona fide risk management hedges.

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

USDA provides the first supply and demand estimates for the 2019-20 marketing-year in May. Previous projections were based on computer models that did not include any survey information from farmers. The May projections will use the *Prospective Plantings* information and possibly, while unlikely, adjust the trend-yields based on planting progress. This article will discuss potential supply and demand balance sheets for corn, soybeans, and wheat along with the effect of reduced corn area, increased soybean area, or reduced wheat demand on price potential.

The projected 2019-20 U.S. corn balance sheet provided in Table 12 assumes a planted area of 92.8 million acres. The trend-yield is assumed to be 176 bushels/acre, with lower and higher yields included to show the impact of a 6-bushel lower or higher yield (Table 12). Total use is projected at 14.7 billion bushels and is based on April 2019 *FAPRI* projections. The *FAPRI* computer model projects corn use to increase by 200 million bushels from the 2018-19 marketing-year.

If farmers can plant 92.8 million acres and the trend-yield of 176 bushels per acre is achieved, then corn stocks are projected to increase by 268 million bushels. The projected stocks-to-use ratio would be 15.6%, and the U.S. marketing-year average (MYA) farm price would decline to $\$3.45$ per bushel (Table 12). A yield of 182 bushels/acre would cause stocks to increase to 2.8 billion bushels and push the U.S. MYA price lower to $\$3.28/\text{bushel}$. In contrast, a lower yield of 170-bushels would allow stocks to decline to 1.8 billion bushels with a stocks-to-use ratio to 12.1%. In this scenario, the U.S. MYA price would increase to $\$3.67/\text{bushel}$ (Table 12).

Table 12. Projected 2019-20 U.S. Corn Balance Sheet for Projected and Reduced Planted Area.

	Prospective Plantings			Weather Prevents Corn Area		
	2019-20	2019-20	2019-20	2019-20	2019-20	2019-20
Planted Area	92.8	92.8	92.8	90.5	90.5	90.5
Harvested Area	85.2	85.2	85.2	83.1	83.1	83.1
2019 Yield	170.0	176.0	182.0	170.0	176.0	182.0
	Million Bushels			Million Bushels		
Beginning Stocks	2,035			2,035		
Production	14,482	14,993	15,504	14,125	14,623	15,122
Imports	40			40		
Total Supply	16,557	17,068	17,579	16,200	16,698	17,197
Total Domestic	12,501					
Export	2,264					
Total Use	14,765	14,765	14,765	14,765	14,765	14,765
Ending	1,792	2,303	2,814	1,435	1,933	2,432
S/U	12.1%	15.6%	19.1%	9.7%	13.1%	16.5%
MYA Price	\$3.67	\$3.45	\$3.28	\$3.87	\$3.61	\$3.41

If weather prevents 2.3 million acres from being planted and yields are 176-bushels, then corn stocks could decline to 1.9 billion bushels. The U.S. MYA price would be \$3.61/bushel. If the U.S. yield is below-trend, then stocks could decline to 1.4 billion bushels and would support a price of \$3.87/bushel. For the combination of a reduced area but a larger yield, stocks could increase to 2.4 billion bushels with a U.S. MYA price of \$3.41/bushel.

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

Table 12 serves as a reminder that lower area doesn't automatically translate into lower stocks as a trend or above trend yields could keep stocks at the 2018-19 levels or larger. Lower yields and reduced acreage will provide fundamental support for a higher price. Also, the futures market might provide pricing opportunities if there is a perception of yield loss.

The projected 2019-20 U.S. soybean balance sheet is provided in Table 13 and compares the *Prospective Plantings* soybean area to the potential of even greater soybean area due to intended corn area switching to soybeans.

Table 13. Projected 2019-20 U.S. Soybean Balance Sheet for Projected and Increased Planted Area.

	2019-20	2019-20	2019-20	2019-20	2019-20	2019-20
	Prospective Plantings			Weather Causes Increased Soybean Area		
Planted Area	84.6	84.6	84.6	86.7	86.7	86.7
Harvested Area	83.9	83.9	83.9	85.9	85.9	85.9
2019 Yield	47.0	49.5	52.0	47.0	49.5	52.0
	Million Bushels			Million Bushels		
Beginning Stocks	895			895		
Production	3,948	4,155	4,363	4,040	4,253	4,466
Imports	20			20		
Total Supply	4,863	5,070	5,278	4,955	5,168	5,381
Total Domestic	2,253			2,253		
Export	1,966			1,966		
Total Use	4,219	4,219	4,219	4,219	4,219	4,219
Ending	644	851	1,059	736	949	1,162
S/U	15.3%	20.2%	25.1%	17.5%	22.5%	27.5%
MYA Price	\$9.20	\$8.73	\$8.36	\$8.98	\$8.55	\$8.21

If the U.S. plants 84.6 million acres and harvests the trend-yield of 49.5-bushels, the total supply will exceed 5 billion bushels. Assuming *FAPRI's* projected soybean use of 4.2 billion bushels, an increase of 115 million bushels over 2018-19, soybean stocks would decline by 44 million bushels to 851 million. The stocks-to-use ratio of 20.2% suggests a U.S. MYA price of \$8.73/bushel. A larger yield of 52-bushels would increase stocks to over 1 billion bushels and causes prices to decline to \$8.36/bushel.

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

Table 13 suggests that even with increased use from 2018-19, ending stocks could increase to over 1 billion bushels even with the reduced planted area. If weather causes 2.1 million acres to switch from corn to soybeans, then trend or above-trend yields would cause stocks to increase to 949 million or 1.1 billion bushels, respectively (Table 13). If stocks were to exceed 1 billion bushels, then farmers should expect the U.S. MYA to decline to the below \$8.40 per bushel or even below \$8.25 per bushel depending on the stocks-to-use ratio (Table 13).

The wheat marketing-year ends in May, so the appropriate sensitivity analysis is for total wheat use for the 2019-20 marketing-year. USDA projects total wheat area at 45.8 million acres, which is the smallest area on record for the last 100 years. If a trend-yield of 48-bushels is harvested, then the 2019 wheat crop would be 1.86 billion bushels, and total wheat supply would exceed 3 billion bushels (Table 14).

Projected wheat use of 2.1 billion bushels is marginally larger (58 million bushels) than last year's use. At a yield of 48 bushels/acre, wheat stocks would decline by 95 million bushels to 960 million bushels. The projected U.S. MYA farm price would be \$5.28 per bushel. A lower yield of 44-bushels would allow stocks to fall by 250 million bushels to 805 million bushels. The U.S. MYA price for this scenario would be \$5.47 per bushel. In contrast, a larger yield of 52-

bushels would cause stocks to increase by 60 million bushels to 1.1 billion bushels (Table 14). The increased stocks would push the U.S. MYA farm price to \$5.11 per bushel.

Table 14. Projected 2019-20 U.S. Wheat Balance Sheet for Projected Use and Reduced Use.

	Prospective Plantings			Weaker Use		
	2019-20	2019-20	2019-20	2019-20	2019-20	2019-20
Planted Area	45.8	45.8	45.8	45.8	45.8	45.8
Harvested Area	38.7	38.7	38.7	38.7	38.7	38.7
2019 Yield	44.0	48.0	52.0	44.0	48.0	52.0
	Million Bushels			Million Bushels		
Beginning Stocks	1,055			1,055		
Production	1,705	1,860	2,015	1,705	1,860	2,015
Imports	145			145		
Total Supply	2,905	3,060	3,215	2,905	3,060	3,215
Total Domestic	1,151	1,151	1,151			
Export	949	949	949			
Total Use	2,100	2,100	2,100	1,980	1,980	1,980
Ending	805	960	1,115	925	1,080	1,235
S/U	38.3%	45.7%	53.1%	46.7%	54.5%	62.4%
MYA Price	\$5.47	\$5.28	\$5.11	\$5.25	\$5.08	\$4.93

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

Table 14 considers the impact of stagnant use, like the total demand for the 2017-18 marketing-year of 1.98 billion bushels. The habitual problem in the wheat market is exports, so this sensitivity analysis illustrates the potential impact of weak demand.

At the trend-yield, wheat stocks could increase to 1.08 billion bushels, and the U.S. MYA price would be \$5.08 per bushel.

Table 14 serves as a reminder that a weaker than expected demand for U.S. wheat could cause stocks to increase and pressure prices lower. The impact of harvesting above-trend yields with weak demand could push the U.S. MYA price below \$5/bushel (Table 14).

Is there any fodder to feed the corn market bull? A weather event that reduces corn planted area and may also keep yields tempered at the trend or below-trend would provide the fundamental support for higher prices. Unfortunately, this production impact will not be fully measured until combines roll in the fall. The fear of reduced production could provide hedging opportunities as the market bids in a risk premium, so managers should pay attention for marketing opportunities.


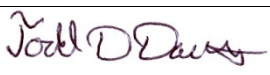

The fodder to feed the soybean market bull requires a trade agreement with China coupled with reduced production. The outbreak of African Swine Fever in China has cut their demand for soybeans and soybean meal, so the large volume of stocks created in the 2018-19 marketing-year may take years to unwind. Especially if weather shifts intended corn acres to soybeans and yields are trend or above-trend.

Any fodder for the wheat market's bull will require a production problem in a competing exporting country that will shift exports to the United States. A below-trend yield will also help keep prices from tanking. The wheat market may not become a raging bull – more like a feisty steer.

Marketing opportunities often occur when you are busy trying to plant corn, soybeans and harvest wheat. Take time to monitor the market for pricing opportunities. Know your production costs to develop pricing points for your crops to market at profitable levels.

Topic 8. 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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