Crops Marketing and Management Update

Grains and Forage Center of Excellence

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Topics in this Month's Update:

Topic 1. December *WASDE* Report: Markets Wait for January Reports

USDA does not conduct a crop production survey in December. As a result, the December *WASDE* receives little attention from the market. Instead, analysts and traders wait for the final production and quarterly stocks estimates released in January.

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

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Area (million)	94.0	90.2	89.1	89.9	+0.8
Harvested Area (million)	86.7	82.7	81.7	81.8	+0.1
Yield (bushels/acre)	174.6	176.6	176.4	167.0	-9.4
	---------- Million Bushels ----------				
Beginning Stocks	1,737	2,293	2,140	2,114	-26
Production	15,148	14,609	14,420	13,661	-759
Imports	57	36	28	50	+22
Total Supply	16,942	16,939	16,588	15,825	-763
Feed and Residual	5,472	5,304	5,618	5,275	-343
Food, Seed & Industrial	6,883	7,056	6,791	6,790	-1
Ethanol and by-products	5,432	5,605	5,376	5,375	-1
Exports	2,293	2,438	2,065	1,850	-215
Total Use	14,649	14,799	14,474	13,915	-559
Ending Stocks	2,293	2,140	2,114	1,910	-204
Stocks/Use	15.7%	14.5%	14.6%	13.7%	-0.9%
Days of Stocks	57	53	53	50	-3
U.S. Marketing-Year Average Price ($/bu)	$3.36	$3.36	$3.61	$3.85	+$0.24

Source:December 2019 WASDE - USDA: WAOB.

For example, USDA did not adjust the old-crop and new-crop corn supply and demand projections (Table 1). USDA projects the 2019 corn crop at 13.6 billion bushels with a carry-out of 1.9 billion bushels (Table 1). Since stocks are projected to decline from the 2018 marketing year, the U.S. marketing year average (MYA) farm price is currently projected at $3.85/bushel.

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

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Area (million)	83.4	90.2	89.2	76.5	-12.7
Harvested Area (million)	82.7	89.5	87.6	75.6	-12.0
Yield (bushels/acre)	52	49.3	50.6	46.9	-3.7
	---------- Million Bushels ----------				
Beginning Stocks	197	302	438	913	+475
Production	4,296	4,412	4,428	3,550	-878
Imports	22	22	14	20	+6
Total Supply	4,515	4,735	4,880	4,483	-397
Crushings	1,901	2,055	2,092	2,105	+13
Exports	2,174	2,129	1,748	1,775	+27
Seed	105	104	89	96	+7
Residual	34	9	39	32	-7
Total Use	4,213	4,297	3,967	4,008	+41
Ending Stocks	302	438	913	475	-438
Stocks/Use	7.2%	10.2%	23.0%	11.9%	-11.2%
Days of Stocks	26	37	84	43	-40.7
U.S. Marketing-Year Average Price ($/bu)	$9.47	$9.33	$8.48	$8.85	+$0.37

Similarly, USDA made no changes to the old-crop and new-crop soybean supply and demand tables in the December report (Table 2). The only adjustment USDA made was to reduce the 2019-20 U.S. MYA price by $0.15/bushel to a projected $8.85/bushel (Table 2). If realized, the 2019 soybean crop is 878 million bushels smaller than last year's crop, and the 2019-20 ending stocks would be reduced by almost half from 2018 to 475 million bushels (Table 2).

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

	2016-17	2017-18	2018-19 Estimated	2019-20 Projected	Change from 18-19
Planted Acres (million)	50.1	46.1	47.8	45.2	-2.6
Harvested Acres (million)	43.9	37.6	39.6	37.2	-2.4
Yield (bushels/acre)	52.7	46.4	47.6	51.7	+4.1
	---------- Million Bushels ----------				
Beginning Stocks	976	1,181	1,099	1,080	-19
Production	2,309	1,741	1,885	1,920	+35
Imports	118	157	135	105	-30
Total Supply	3,402	3,079	3,119	3,105	-14
Food	949	964	955	955	+0
Seed	61	63	59	61	+2
Feed and Residual	156	51	90	140	+50
Exports	1,055	901	936	975	+39
Total Use	2,222	1,980	2,039	2,131	+92
Ending Stocks	1,181	1,099	1,080	974	-106
Stocks/Use	53.2%	55.5%	53.0%	45.7%	-7.3%
Days of Stocks	194	203	193	167	-27
U.S. Marketing-Year Average Price ($/bu)	$3.89	$4.72	$5.16	$4.55	-$0.610

Source:December 2019 WASDE - USDA: WAOB.

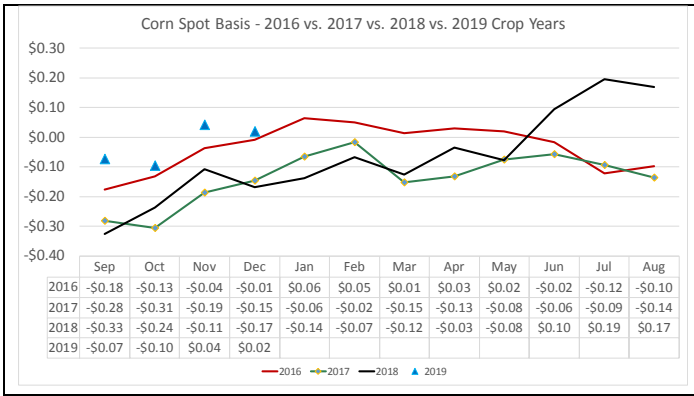
USDA did not adjust the old-crop wheat balance sheet in the December report. USDA increased new-crop exports by 25 million bushels to a projected 975 million bushels and reduced imports by 15 million bushels. The net effect is a 40 million bushel reduction in ending stocks from the November report (Table 3). If realized, wheat stocks would decline by 106 million bushels from 2018. The U.S. MYA wheat price would decline from 2018 to $4.55/bushel due to a lack of a harvest-time risk premium bid into wheat prices in 2019.

Topic 2. 2019 Corn, Soybean and Wheat Basis vs. Previous Years

Figure 1, Figure 2, and Figure 3 show the monthly average corn, soybean, and wheat spot basis, respectively, for twelve Western Kentucky markets. For each figure, the red line is the basis for the 2016 crop. The green line is the 2017 basis, while the black line represents the 2018 basis. The blue triangles represent the 2019 basis.

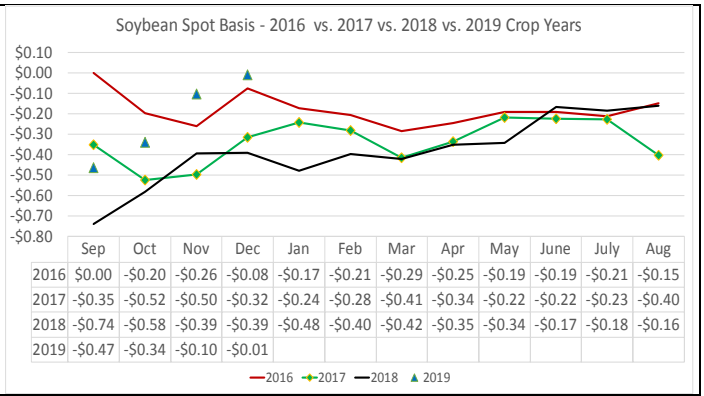
The corn basis is $0.02/bushel above the March corn contract, which is a $0.19/bushel increase from the 2018 basis in December. Last year, the corn basis appreciated from October to February by $0.17/bushel, which was $0.12/bushel less than the amount of appreciation in basis for the 2017 corn crop from harvest to February (Figure 1).

The average soybean basis, as of December 27, 2019, was -$0.01/bushel under the January 2020 soybean contract. The basis is $0.38 per bushel narrower than the 2018 basis in December, and $0.31 per bushel narrower than the 2017 basis (Figure 2). Last year, the basis appreciated $0.18/bushel from October to February, but the 2017 crop's basis appreciated $0.24/bushel from harvest to February. For the 2019 crop, the appreciation from October is $0.33.



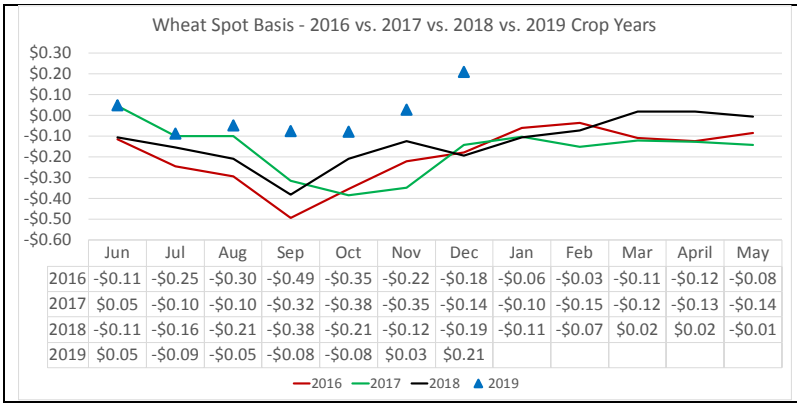
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
2016	-$0.18	-$0.13	-$0.04	-$0.01	$0.06	$0.05	$0.01	$0.03	$0.02	-$0.02	-$0.12	-$0.10
2017	-$0.28	-$0.31	-$0.19	-$0.15	-$0.06	-$0.02	-$0.15	-$0.13	-$0.08	-$0.06	-$0.09	-$0.14
2018	-$0.33	-$0.24	-$0.11	-$0.17	-$0.14	-$0.07	-$0.12	-$0.03	-$0.08	$0.10	$0.19	$0.17
2019	-$0.07	-$0.10	$0.04	$0.02								

Figure 1. Western Kentucky Corn Spot Market Basis Appreciation from September to August for the 2016 to 2019 Crop Years.
Basis Calculated on December 27, 2019



	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
2016	$0.00	-$0.20	-$0.26	-$0.08	-$0.17	-$0.21	-$0.29	-$0.25	-$0.19	-$0.19	-$0.21	-$0.15
2017	-$0.35	-$0.52	-$0.50	-$0.32	-$0.24	-$0.28	-$0.41	-$0.34	-$0.22	-$0.22	-$0.23	-$0.40
2018	-$0.74	-$0.58	-$0.39	-$0.39	-$0.48	-$0.40	-$0.42	-$0.35	-$0.34	-$0.17	-$0.18	-$0.16
2019	-$0.47	-$0.34	-$0.10	-$0.01								

Figure 2. Western Kentucky Soybean Spot Market Basis Appreciation from September to August for the 2016 to 2019 Crop Years.
Basis Calculated on December 27, 2019



	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May
2016	-$0.11	-$0.25	-$0.30	-$0.49	-$0.35	-$0.22	-$0.18	-$0.06	-$0.03	-$0.11	-$0.12	-$0.08
2017	$0.05	-$0.10	-$0.10	-$0.32	-$0.38	-$0.35	-$0.14	-$0.10	-$0.15	-$0.12	-$0.13	-$0.14
2018	-$0.11	-$0.16	-$0.21	-$0.38	-$0.21	-$0.12	-$0.19	-$0.11	-$0.07	$0.02	$0.02	-$0.01
2019	$0.05	-$0.09	-$0.05	-$0.08	-$0.08	$0.03	$0.21					

Figure 3. Western Kentucky Wheat Spot Market Basis Appreciation from June to May for the 2016 to 2019 Crop Years.
Basis Calculated on December 27, 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 since March 2018 and is much stronger than the basis for the 2016 wheat crop.

The 2019 wheat basis is $0.21/bushel above the March futures contract. The basis is the strongest of the three previous years. Managers should monitor the basis for new-crop wheat to take advantage of the strong wheat basis.

Topic 3. Projected Corn, Soybean, and Wheat Futures Trading Ranges to July 2020

Figures 4–6 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.

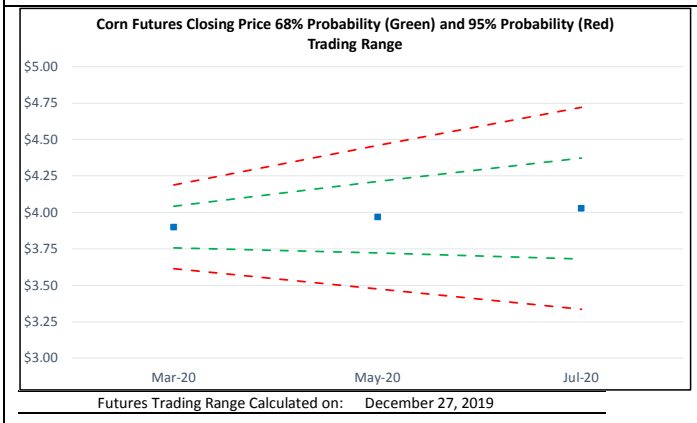
Figure 4 provides the probabilistic trading range for the corn futures contracts from March 2020 to July 2020. There is a 68% probability that the March 2020 corn contract will trade between $3.76 and $4.04 and a 95% probability that the March 2020 corn contract will trade between $3.61 and $4.19. The July 2020 corn contract has a 68% probability of trading between $3.68 and $4.37 per bushel, which reflects the volatility in the corn futures contracts for the deferred months (Figure 4).

Figure 5 provides the probabilistic trading range for soybean futures contracts from January 2020 to July 2020. 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 $9.23 and $9.60 per bushel. The July 2020 soybean contract has a 68% probability of trading between $9.21 and $10.12 per bushel (Figure 5).

Figure 6 provides the probabilistic trading range for the wheat futures contract from March 2020 to July 2020 contracts. The March 2020 wheat contract has a 68% chance of trading between $5.15 and $5.97/bushel, which should be monitored for managing 2019 wheat that is planned to be stored. The July 2020 Futures contract has a 68%

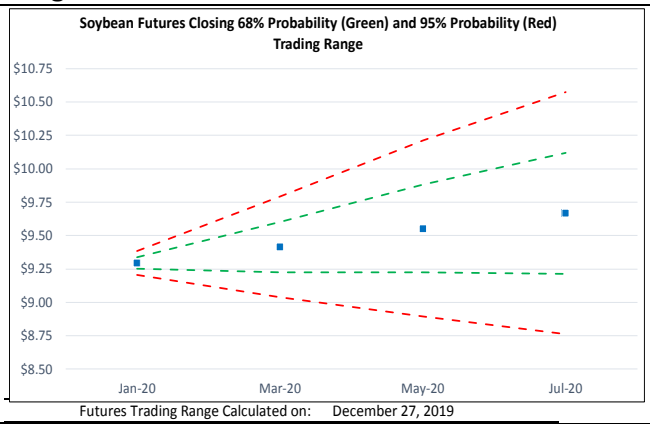
probability of trading between $4.97 and $6.22 per bushel and should be considered as a tool to manage price risk for producers growing wheat for 2020 (Figure 6).

Figure 4. Corn Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



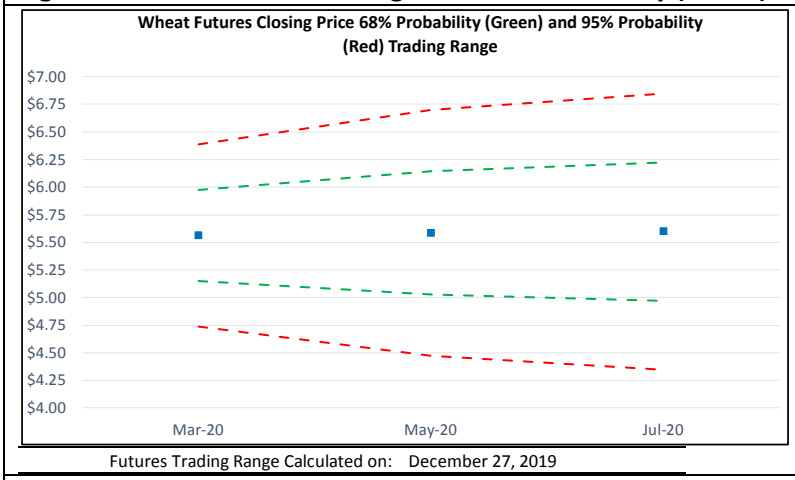
Trading range calculated on December 27, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on December 27, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 5. Soybean Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on December 27, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on December 27, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Figure 6. Wheat Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.



Trading range calculated on December 27, 2019, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on December 27, 2019, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Topic 4. Pre-Harvest 2020 Corn, Soybean, Wheat and Double-Crop Soybean Risk Management Opportunities

Tables 4-7 analyze the effectiveness of using hedging with futures, forward contracts, and put options in protecting revenue that covers total input costs, cash rent, overhead, and family living for corn, soybeans, and double-crop soybeans in 2020. Managers should monitor the futures market for opportunities because sometimes the best pricing opportunities occur several weeks before planting. These examples are provided to help raise awareness of risk management opportunities available now for managers planning their 2020 production. I am using the same costs as 2019 because I do not anticipate input costs or rental rates to decline significantly from 2019.

Table 4 presents risk management alternatives for Western Kentucky corn production for 2020. 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 $3.73/bushel assuming a -$0.30/bushel harvest-time basis. The second alternative is to lock in a cash price through a forward contract at $3.77/bushel. The third alternative is to establish a price floor at $3.45/bushel by buying a put option with a $4.00 strike price that costs $0.246 (Table 4).

Table 4. Risk Management Alternatives for 2020 Western Kentucky Corn for Various Yield Objectives.

Yield	150	160	170	180	190	200
TVC+Rent+Overhead+Family Living ($/acre)	$714	$714	$714	$714	$714	$714
TVC+Rent+Overhead+Family Living ($/bu)	$4.76	$4.46	$4.20	$3.97	$3.76	$3.57
Hedge @ $4.03+ -$0.30 basis = $3.73	-$1.03	-$0.73	-$0.47	-$0.23	-$0.02	+$0.17
Forward Contract at $3.77	-$0.98	-$0.69	-$0.42	-$0.19	+$0.02	+$0.21
Put: $4.00 strike @$0.246 = $3.45 floor	-$1.31	-$1.01	-$0.75	-$0.51	-$0.30	-$0.12
Strategies Evaluated on:	December 27, 2019					

Table 4 demonstrates that risk management opportunities only exist to lock in a profit above total economic costs and family living if yields exceed 190-bushels. If the 2019 corn crop is reduced in future reports and stocks decline, the December 2020 corn futures contract may increase to a price level that provides profitable risk management opportunities for lower expected yields.

Table 5 illustrates the risk management potential for full-season soybeans in 2020. Current prices are providing an opportunity to lock in a return over total economic costs plus family living of $0.52/bushel for yields of 60 bushels/acre or greater using forward contracts.

Table 5. Risk Management Alternatives for 2020 Western Kentucky Soybeans for Various Yield Objectives.

Yield	45	50	55	60	65
TVC+Rent+Overhead+Family Living ($/acre)	$532	$532	$532	$532	$532
TVC+Rent+Overhead+Family Living ($/bu)	$11.82	$10.64	$9.67	$8.87	$8.18
Hedge @ $9.70 + -$0.40 basis = $9.30	-$2.52	-$1.34	-$0.38	+$0.43	+$1.11
Forward Contract at $9.38	-$2.44	-$1.26	-$0.29	+$0.52	+$1.20
Put: $9.60 strike @$0.454 = $8.75 floor	-$3.08	-$1.89	-$0.93	-$0.12	+$0.56
Strategies Evaluated on:	December 27, 2019				

Table 6. Risk Management Alternatives for 2020 Western Kentucky Wheat for Various Yield Objectives.

Yield	80	85	90	95	100
TVC+50% Rent+Overhead+Family Living ($/acre)	$470	$470	$470	$470	$470
TVC+50% Rent+Overhead+Family Living ($/bu)	$5.88	$5.53	$5.22	$4.95	$4.70
Hedge @ $5.60 - $0.05 basis = $5.55	-$0.33	+$0.02	+$0.33	+$0.60	+$0.85
Forward Contract at $5.73	-$0.15	+$0.20	+$0.51	+$0.78	+$1.03
Put: $5.60 strike @$0.351 = $5.11 floor	-$0.68	-$0.33	-$0.02	+$0.25	+$0.50
Strategies Evaluated on:	December 27, 2019				

Table 6 illustrates the risk management potential for wheat in 2020. The costs in Table 6 assume that rent and family living expenses are split evenly between wheat and double-crop soybeans. Current prices are providing an opportunity to lock in a return over total economic costs plus family living for yields of 85 bushels/acre or larger. Some managers have been able to harvest yields of 90 bushels or better, which suggests an opportunity may exist to manage risk by using cash forward contracts.

The market is providing an opportunity to protect double-crop soybean risk for those that typically harvest 45-bushel double-crop soybeans or better. The November 2020 soybean futures could rally further if the size of the 2019 crop declines and if there is some resolution to the trade uncertainty with China (Table 7). Similarly, the market has rallied over rumors of positive trade negotiations only to find the rumors were not true, and the market may slip lower. Managers should monitor pricing opportunities throughout the fall to reduce risk for double-crop soybeans.

Table 7. Risk Management Alternatives for 2020 Western Kentucky Double-Crop Soybeans for Various Yield Objectives.

Yield	35	40	45	50	55
TVC+Rent+Overhead+Family Living ($/acre)	$380	$380	$380	$380	$380
TVC+Rent+Overhead+Family Living ($/bu)	$10.86	$9.50	$8.44	$7.60	$6.91
Hedge @ $9.70+ -$0.40 basis = $9.30	-$1.56	-$0.20	+$0.85	+$1.70	+$2.39
Forward Contract at $9.38	-$1.47	-$0.12	+$0.94	+$1.78	+$2.48
Put: $9.60 strike @$0.454 = $8.75 floor	-$2.11	-$0.75	+$0.30	+$1.15	+$1.84
Strategies Evaluated on:	December 27, 2019				

Topic 5. 2019 Projected Return to Storage for Corn and Soybeans

Table 8 provides projected returns to on-farm and commercial corn storage from harvest to the following June. 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 $3.63 per bushel. The annual interest rate is 5%, which gives a monthly interest cost of $0.015/bushel for corn. The corn futures complex closing prices on December 27, 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 +$0.11/bushel in February 2020. The combination of an optimistic basis appreciation and carry in the futures market provides even larger projected returns to on-farm storage into spring 2020 (Table 8).

Table 8. Projected Return to Storage for On-Farm and Commercial for Corn.

Harvest Cash Price	$3.63						
	DEC	JAN	FEB	MAR	APR	MAY	JUNE
On-Farm Storage Cost ($/bu)	$0.16	$0.17	$0.19	$0.20	$0.22	$0.23	$0.25
Commercial Storage ($/bu)	$0.23	$0.25	$0.31	$0.38	$0.44	$0.51	$0.57
Most Likely Spot Price Forecast ($/bu)	$3.83	$3.89	$3.92	$3.95	$3.98	$4.04	$4.08
Conservative Spot Forecast ($/bu)	$3.73	$3.76	$3.83	$3.82	$3.84	$3.95	$3.97
Optimistic Spot Forecast ($/bu)	$3.97	$4.00	$3.97	$4.06	$4.09	$4.19	$4.17
Returns to On-Farm Storage	+$0.04	+$0.09	+$0.11	+$0.12	+$0.14	+$0.18	+$0.20
Conservative	-$0.05	-$0.03	+$0.02	-$0.01	-$0.01	+$0.09	+$0.10
Optimistic	+$0.18	+$0.20	+$0.16	+$0.23	+$0.25	+$0.33	+$0.30
Returns to Commercial Storage	-$0.03	+$0.02	-$0.02	-$0.05	-$0.08	-$0.09	-$0.12
Conservative	-$0.12	-$0.11	-$0.10	-$0.18	-$0.23	-$0.18	-$0.23
Optimistic	+$0.11	+$0.13	+$0.04	+$0.06	+$0.03	+$0.06	-$0.02

Projected on December 27, 2019.

Table 9. Projected Return to Storage for On-Farm and Commercial for Soybeans.

Harvest Cash Price	$8.83						
	DEC	JAN	FEB	MAR	APR	MAY	JUNE
On-Farm Storage Cost ($/bu)	$0.20	$0.24	$0.27	$0.31	$0.35	$0.38	$0.42
Commercial Storage ($/bu)	$0.37	$0.41	$0.50	$0.53	$0.57	$0.61	$0.64
Most Likely Spot Price Forecast ($/bu)	$9.20	$9.30	$9.30	$9.35	$9.38	$9.53	$9.58
Conservative Spot Forecast ($/bu)	$8.90	$8.94	$9.02	$9.13	$9.20	$9.32	$9.44
Optimistic Spot Forecast ($/bu)	$9.46	$9.60	$9.63	$9.71	$9.70	$9.91	$9.90
Returns to On-Farm Storage	+$0.17	+$0.23	+$0.19	+$0.21	+$0.20	+$0.31	+$0.34
Conservative	-$0.13	-$0.13	-$0.08	-$0.01	+$0.02	+$0.11	+$0.19
Optimistic	+$0.43	+$0.53	+$0.52	+$0.57	+$0.53	+$0.69	+$0.65
Returns to Commercial Storage	-$0.00	+$0.06	-$0.03	-$0.01	-$0.02	+$0.09	+$0.11
Conservative	-$0.30	-$0.30	-$0.31	-$0.23	-$0.20	-$0.11	-$0.03
Optimistic	+$0.25	+$0.36	+$0.30	+$0.34	+$0.30	+$0.47	+$0.43

Projected on December 27, 2019.

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 +$0.02/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 storage for corn to March 2020 is +$0.23/bushel. The optimistic commercial storage return in January is +0.13/bushel (Table 8).

The projected on-farm and commercial storage returns for soybeans are presented in Table 9. The harvest price for soybeans is projected at $8.83 per bushel, with a monthly interest cost of $0.037/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 +$0.23/bushel in January 2020 (Table 9). 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 -$0.13/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 9 suggest a +$0.06/bushel return to commercial storage in January for the most likely basis assumption, but a -$0.30/bushel return for the conservative basis (Table 9).

Topic 6. 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 10 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. Those farms that produced more than 190-bushel corn in 2019 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 to cover all budgeted costs (Table 10).

Table 10. Western Kentucky Corn Storage Risk Management to February 2020 for Various Yield Objectives.

Storage Hedge: Feb 2020	**Corn**			
Yield	170	180	190	200
TVC+Rent+Overhead+Family Living ($/acre)	$714	$714	$714	$714
TVC+Rent+Overhead+Family Living ($/bu)	$4.20	$3.97	$3.76	$3.57
TVC+Rent+OH+Family+$0.21 storage ($/bu)	$4.41	$4.18	$3.97	$3.78
Hedge @ $3.90+$+0.05 basis = $3.95	-$0.46	-$0.23	-$0.02	+$0.17
Forward Contract at $4.05	-$0.36	-$0.12	+$0.09	+$0.27
Put: $3.90 strike @$0.106 = $3.84 floor	-$0.57	-$0.33	-$0.12	+$0.06
Strategies Evaluated on:	December 27, 2019			

Table 11. Western Kentucky Soybean Storage Risk Management to February 2019 for Various Yield Objectives.

Storage Hedge: Feb 2020	**Soybeans**			
Yield	40	50	60	70
TVC+Rent+Overhead+Family Living ($/acre)	$532	$532	$532	$532
TVC+Rent+Overhead+Family Living ($/bu)	$13.30	$10.64	$8.87	$7.60
TVC+Rent+OH+Family+$0.27 storage ($/bu)	$13.57	$10.96	$9.19	$7.92
Hedge @ $9.42 + -$0.10 basis = $9.32	-$4.26	-$1.65	+$0.13	+$1.40
Forward Contract at $9.42	-$4.15	-$1.54	+$0.24	+$1.50
Put: $9.40 strike @$0.19 = $9.11 floor	-$4.46	-$1.85	-$0.08	+$1.19
Strategies Evaluated on:	December 27, 2019			

Table 11 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.

The example illustrates that a yield of 60-bushels is needed to lock in a profit of $0.24/bushel using forward contracts. Table 11 also illustrates that farmers harvesting lower yields will be challenged to find profitability at current prices and the assumed costs.

Topic 7. Potential 2020 Corn and Soybean Acres, Demand Structure, and the Impact on Stocks and Price

USDA's preliminary baseline projections released in November 2019 are for 2020 corn and soybean planted area at 94.5 and 84 million acres, respectively. Since the preliminary projections did not survey farmers, corn and soybean planted area may be greater than USDA's projections. Without a clearly defined resolution to the Chinese trade disruption in soybeans, farmers may view corn as the more profitable and less risky crop to produce in 2020. The

Western Corn Belt tends to have a wider soybean basis than corn basis, and corn yields have been increasing faster than soybeans in that region.

Table 12 considers the 2020 corn area at 94.5 and 96 million acres. Two demand levels are considered. The weak corn demand level assumes exports similar to those in the 2018-19 marketing year, with feed demand increasing to reflect the increased production. The strong demand level assumes exports similar to those for the 2017 marketing year (Table 12). The trend yield of 178.5 bushels/acre is assumed for both acreage and demand scenarios.

Table 12. Potential 2019 Corn Balance Sheet and Price Potential for Changes to 2019 Corn Production.

	Dec 2019	94.5 Mil. Acres	96 Mil. Acres	94.5 Mil. Acres	96 Mil. Acres
		Weak Demand		Stronger Demand	
Planted (million)	89.9	94.5	96.0	94.5	96.0
Harvested (million)	81.8	86.6	88.0	86.6	88.0
Yield (bushels/acre)	167	178.5	178.5	178.5	178.5
		Million Bushels			
Beginning Stocks	2,114	1,910	1,910	1,910	1,910
Production	13,661	15,467	15,712	15,467	15,712
Imports	50	50	50	50	50
Total Supply	15,825	17,427	17,672	17,427	17,672
Feed / Residual	5,275	5,935	6,029	5,935	6,029
FSI	6,790	6,790	6,790	6,790	6,790
Ethanol	5,375	5,375	5,375	5,375	5,375
Exports	1,850	2,000	2,000	2,400	2,400
Total Use	13,915	14,725	14,819	15,125	15,219
Ending Stocks	1,910	2,702	2,853	2,302	2,453
Stocks-to-Use	13.7%	18.35%	19.25%	15.22%	16.12%
Days of Stocks	50	67	70	56	59
MYA Price	$3.85	$3.50	$3.45	$3.75	$3.65

If the 2020 corn planted area is 94.5 million acres with weak demand, stocks could increase to 2.7 billion bushels with the U.S. MYA farm price at $3.50/ bushel. With planted area at 96 million acres and weak demand, corn stocks could increase further to 2.8 billion bushels. In this scenario, the U.S. MYA price would be $3.45/bushel (Table 12).

What are the potential ending stocks and MYA price for corn under a stronger demand for 94.5 and 96 million planted acres? If the 2020 planted area is 94.5 million acres, ending stocks could increase to 2.3 billion bushels with a U.S. MYA price of $3.75/bushel. Planted area of 96 million acres would increase stocks to 2.4 billion bushels with a U.S. MYA price of $3.65/bushel (Table 12).

The message of Table 12 is that the projected increase in corn area will contribute to increased stocks and lower prices for the 2020 marketing year. Stronger demand is needed to keep stocks from growing to a burdensome level and prices from declining below $3.50/bushel. Even with the stronger demand scenario, the U.S. MYA is projected to be less than the 2019 marketing year. This analysis suggests that farmers will continue to experience tight margins and will need to rely on pricing opportunities to protect profitability.

Table 13. Potential 2019 Soybean Balance Sheet and Price Potential for Change to 2019 Soybean Production.

	Dec 19	84 Mil. Acres	86 Mil. Acres	84 Mil. Acres	86 Mil. Acres
		Weak Demand		Stronger Demand	
Planted (million)	76.5	84	86.0	84.0	86.0
Harvested (million)	75.6	83.1	85.0	83.1	85.0
Yield (bushels/acre)	46.9	50	50	50	50
		Million Bushels			
Beginning Stocks	913	475	475	475	475
Production	3,550	4,153	4,252	4,153	4,252
Imports	20	20	20	20	20
Total Supply	4,483	4,648	4,747	4,648	4,747
Crushings	2,105	2,125	2,125	2,125	2,125
Exports	1,775	1,775	1,775	2,125	2,125
Seed	96	96	96	96	96
Residual	32	32	32	32	32
Total Use	4,008	4,028	4,028	4,378	4,378
Ending Stocks	475	620	719	270	369
Stocks/Use	11.9%	15.4%	17.9%	6.2%	8.4%
Days of Stocks	43	56	65	23	31
MYA Price	$8.85	$8.35	$8.00	$10.70	$9.90

Table 13 provides a similar analysis of the soybean market. USDA projects 2020 soybean planted area at 84 million acres. While the market doesn't need additional acres with the weaker demand, the planted area could increase to 86 million acres due to financing constraints forcing farmers to plant soybeans instead of corn. Similarly, the Eastern Corn Belt tends to have a more favorable soybean basis than the Western Corn Belt, which may increase soybean planted areas in those states.

Table 13 assumes soybean planted area of 84 and 86 million acres with a trend-yield of 50 bushels/acre. The weak demand scenario is almost identical to the 2019-20 projected use, except for a slight increase in crushing demand. The strong demand scenario assumes exports increase to a level similar to the 2017-18 marketing year.

If soybean area increases to 84 million acres with weak demand, soybean stocks could increase to 620 million bushels and the U.S. MYA price falling to $8.35/bushel. An acreage increase to 86 million bushels with weak use could potentially increase stocks to over 700 million bushels. The increase in stocks under weak demand could push prices lower to about $8.00/bushel (Table 13).

The stronger demand scenario suggests that the soybean area at 84 million acres would potentially reduce stocks to 270 million bushels. If the soybean stocks-to-use ratio falls to 6.2%, the U.S. MYA price could potentially increase to $10.70/bushels. Even with a planted area at 86 million acres, the ending stocks for the 2020-21 marketing year could be 369 million bushels with a US MYA price of $9.90/bushels (Table 13).

The U.S. and China might be able to complete an agreement that increases soybean demand for the 2020 marketing year. Depending on the timing of Chinese purchases, the 2020 November soybean futures contract may have to "buy" acres and provide pricing opportunities. Since the details have not been released, farmers should monitor the market for pricing opportunities. If the phase-one agreement is approved, then soybeans have the potential for a stronger market in 2020 and possibly 2021.

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

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