

Crops Marketing and Management Update

Grains and Forage Center of Excellence

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Topic 1. February *WASDE*: USDA Makes Minor Adjustments

The February *WASDE* does not have a reputation of providing significant changes to the corn, soybean, or wheat balance sheet because USDA does not update production estimates. The report focuses on changes in use.

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	88.9	89.7	+0.8
Harvested Area (million)	86.7	82.7	81.3	81.5	+0.2
Yield (bushels/acre)	174.6	176.6	176.4	168.0	-8.4
----- Million Bushels -----					
Beginning Stocks	1,737	2,293	2,140	2,221	+81
Production	15,148	14,609	14,340	13,692	-648
Imports	57	36	28	50	+22
Total Supply	16,942	16,939	16,509	15,962	-547
Feed and Residual	5,472	5,304	5,432	5,525	+93
Food, Seed & Industrial	6,883	7,056	6,791	6,820	+29
Ethanol and by-products	5,432	5,605	5,376	5,425	+49
Exports	2,293	2,438	2,065	1,725	-340
Total Use	14,649	14,799	14,288	14,070	-218
Ending Stocks	2,293	2,140	2,221	1,892	-329
Stocks/Use	15.7%	14.5%	15.5%	13.4%	-2.1%
Days of Stocks	57	53	57	49	-8
U.S. Marketing-Year Average Price (\$/bu)	\$3.36	\$3.36	\$3.61	\$3.85	+\$0.24

Source: February 2020 *WASDE* - USDA: WAOB.

Analysts surveyed before the report's release expected corn stocks to be reduced by 36 million bushels from the January estimate. USDA increased ethanol use by 50 million bushels but reduced projected exports by 50 million bushels from the January estimates. These offsetting adjustments mean that stocks were not adjusted and are projected at 1.89 billion bushels (Table 1). The U.S. MYA farm price remains a projected \$3.85/bushel, which is a \$0.24/bushel increase from the 2018 price (Table 1).

USDA did not adjust projected corn production in Argentina and Brazil from the January report. Analysts expected USDA to trim the size of the crop in each country by 8 million bushels from the January report. If realized, the Argentine and Brazilian corn crop would be 1.9 and 4.6 billion bushels, respectively. The Argentine corn crop would be 85 million bushels smaller than the previous year's crop. In contrast, the Brazilian corn crop would be 294 million bushels larger than last year's crop.

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	76.1	-13.1
Harvested Area (million)	82.7	89.5	87.6	75.0	-12.6
Yield (bushels/acre)	52	49.3	50.6	47.4	-3.2
----- Million Bushels -----					
Beginning Stocks	197	302	438	909	+471
Production	4,296	4,412	4,428	3,558	-870
Imports	<u>22</u>	<u>22</u>	<u>14</u>	<u>15</u>	<u>+1</u>
Total Supply	4,515	4,735	4,880	4,482	-398
Crushings	1,901	2,055	2,092	2,105	+13
Exports	2,174	2,129	1,748	1,825	+77
Seed	105	104	89	96	+7
Residual	<u>34</u>	<u>9</u>	<u>43</u>	<u>32</u>	<u>-11</u>
Total Use	4,213	4,297	3,971	4,058	+87
Ending Stocks	302	438	909	425	-484
Stocks/Use	7.2%	10.2%	22.9%	10.5%	-12.4%
Days of Stocks	26	37	84	38	-45.3
U.S. Marketing-Year Average Price (\$/bu)	\$9.47	\$9.33	\$8.48	\$8.75	+\$0.27

Source: February 2020 WASDE - USDA: WAOB.

Analysts expected USDA to reduce soybean stocks by 27 million bushels from the January report. USDA did reduce projected soybean stocks by a greater than expected amount. USDA trimmed soybean stocks by 51 million bushels from last month's estimates.

USDA increased soybean exports by 50 million bushels from the January report to a projected 1.8 billion bushels. If realized, 2019 soybean exports would be 77 million bushels greater than last year's exports. While this is an improvement, soybean exports are projected to be 304 million bushels less than the 2017-18 marketing year exports before the trade disruptions started with China. The other adjustment to the soybean balance sheet is a \$0.25/bushel reduction in the U.S. MYA price to \$8.75/bushel (Table 2).

USDA did not adjust the size of the Argentine soybean crop, which is projected at 1.9 billion bushels. USDA did increase the size of the Brazilian soybean crop by 73 million bushels to a projected 4.59 billion bushels. The Brazilian soybean crop is projected to be 294 million bushels larger than last year's crop, while the Argentina soybean crop is projected to be 85 million bushels smaller than last year's crop.

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	<u>118</u>	<u>157</u>	<u>135</u>	<u>105</u>	<u>-30</u>
Total Supply	3,402	3,079	3,119	3,105	-14
Food	949	964	955	955	+0
Seed	61	63	59	60	+1
Feed and Residual	156	51	90	150	+60
Exports	<u>1,055</u>	<u>901</u>	<u>936</u>	<u>1,000</u>	<u>+64</u>
Total Use	2,222	1,980	2,039	2,165	+126
Ending Stocks	1,181	1,099	1,080	940	-140
Stocks/Use	53.2%	55.5%	53.0%	43.4%	-9.5%
Days of Stocks	194	203	193	158	-35
U.S. Marketing-Year Average Price (\$/bu)	\$3.89	\$4.72	\$5.16	\$4.55	-\$0.61

Source: February 2020 WASDE - USDA: WAOB.

Analysts expected USDA to reduce wheat stocks by 12 million bushels from the January report. USDA did reduce wheat stocks, but by a larger than expected amount. USDA increased wheat exports by 25 million bushels to a projected 1 billion bushels. If realized, wheat exports would be the largest amount since the 2016-17 marketing year (Table 3). USDA did not adjust the 2019-20 U.S. MYA price from the January report, which remains at a projected \$4.55/bushel.

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.

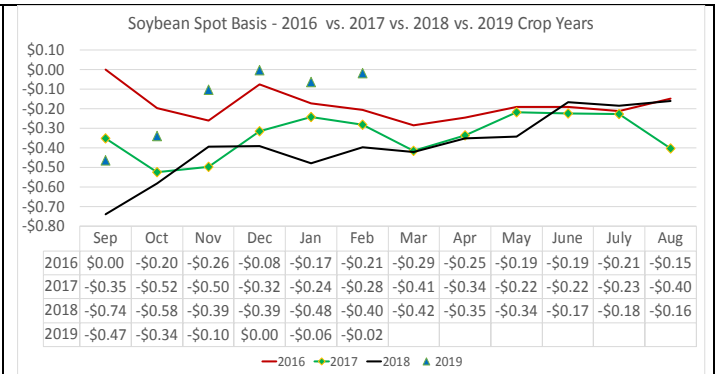
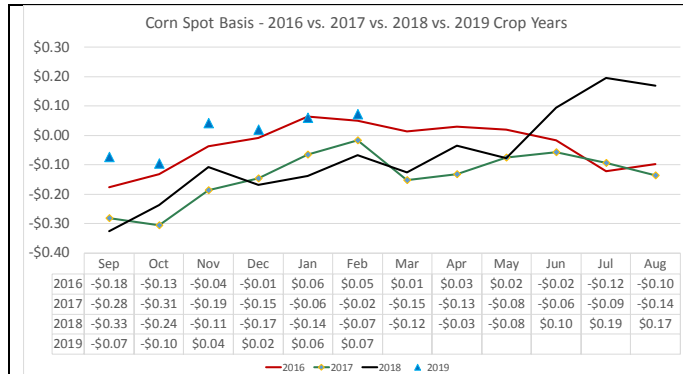
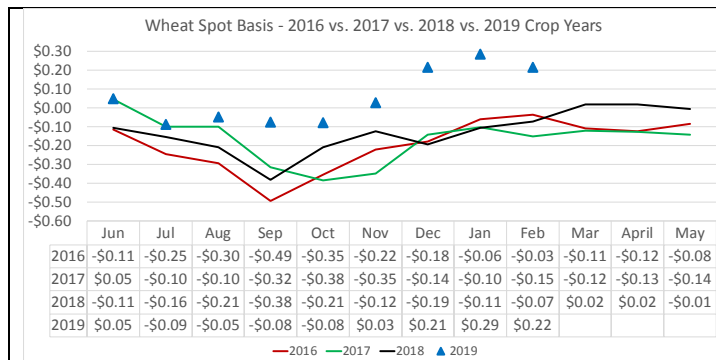


Figure 1. Western Kentucky Corn Spot Market Basis Appreciation from September to August for the 2016 to 2019 Crop Years.
Basis Calculated on February 14, 2020

Figure 2. Western Kentucky Soybean Spot Market Basis Appreciation from September to August for the 2016 to 2019 Crop Years.
Basis Calculated on February 14, 2020

The corn basis is \$0.07/bushel above the March corn contract, which is a \$0.14/bushel increase from the 2018 basis in February. 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 the basis for the 2017 corn crop from harvest to February. The current corn basis appreciation from October for the 2019 corn crop is \$0.17/bushel (Figure 1).

The average soybean basis, as of February 14, 2020, was -\$0.02/bushel under the March 2020 soybean contract. The basis is \$0.38 per bushel narrower than the 2018 basis in February (Figure 2). Last year, the basis appreciated \$0.18/bushel from October to February, but the 2017 crop's basis appreciated \$0.22/bushel from harvest to February. For the 2019 crop, the appreciation from October is \$0.32 (Figure 2).



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 +\$0.22/bushel above the March futures contract. The 2019-wheat basis is still narrower than the basis for 2018, 2017, and 2016 crops in February. Managers using HTA contracts for 2020 July wheat should monitor the basis for opportunities to fix the basis at stronger levels than previous crop year's basis.

Figure 3. Western Kentucky Wheat Spot Market Basis Appreciation from June to May for the 2016 to 2019 Crop Years.
Basis Calculated on February 14, 2020

Topic 3. 2019 Projected Return to Storage for Corn and Soybeans

Table 4 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 February 14, 2020, 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 an optimistic basis, is +\$0.09/bushel in March 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, with a potential return of \$0.16/bushel in May 2020 (Table 4).

Table 4. Projected Return to Storage for On-Farm and Commercial for Corn.						Table 5. Projected Return to Storage for On-Farm and Commercial for Soybeans.					
Harvest Cash Price	\$3.63					Harvest Cash Price	\$8.83				
	FEB	MAR	APR	MAY	JUNE		FEB	MAR	APR	MAY	JUNE
On-Farm Storage Cost (\$/bu)	\$0.19	\$0.20	\$0.22	\$0.23	\$0.25	On-Farm Storage Cost (\$/bu)	\$0.27	\$0.31	\$0.35	\$0.38	\$0.42
Commercial Storage (\$/bu)	\$0.31	\$0.38	\$0.44	\$0.51	\$0.57	Commercial Storage (\$/bu)	\$0.50	\$0.53	\$0.57	\$0.61	\$0.64
Most Likely Spot Price Forecast (\$/bu)	\$3.80	\$3.80	\$3.83	\$3.87	\$3.90	Most Likely Spot Price Forecast (\$/bu)	\$8.82	\$8.83	\$8.86	\$9.01	\$9.07
Conservative Spot Forecast (\$/bu)	\$3.71	\$3.67	\$3.69	\$3.78	\$3.80	Conservative Spot Forecast (\$/bu)	\$8.54	\$8.61	\$8.68	\$8.81	\$8.93
Optimistic Spot Forecast (\$/bu)	\$3.85	\$3.91	\$3.95	\$4.01	\$4.00	Optimistic Spot Forecast (\$/bu)	\$9.15	\$9.19	\$9.18	\$9.40	\$9.39
Returns to On-Farm Storage						Returns to On-Farm Storage					
Conservative	-\$0.02	-\$0.03	-\$0.01	+\$0.01	+\$0.03	Conservative	-\$0.28	-\$0.31	-\$0.32	-\$0.20	-\$0.18
Optimistic	-\$0.10	-\$0.16	-\$0.15	-\$0.08	-\$0.08	Optimistic	-\$0.56	-\$0.53	-\$0.50	-\$0.40	-\$0.32
	+\$0.04	+\$0.09	+\$0.10	+\$0.16	+\$0.13		+\$0.05	+\$0.05	+\$0.01	+\$0.18	+\$0.14
Returns to Commercial Storage						Returns to Commercial Storage					
Conservative	-\$0.14	-\$0.20	-\$0.23	-\$0.26	-\$0.29	Conservative	-\$0.51	-\$0.53	-\$0.54	-\$0.42	-\$0.40
Optimistic	-\$0.23	-\$0.33	-\$0.38	-\$0.35	-\$0.40	Optimistic	-\$0.78	-\$0.75	-\$0.72	-\$0.62	-\$0.54
	-\$0.08	-\$0.09	-\$0.12	-\$0.12	-\$0.20		-\$0.18	-\$0.18	-\$0.22	-\$0.04	-\$0.08
Projected on February 14, 2020.						Projected on February 14, 2020.					

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 -\$0.08/bushel in February, assuming the optimistic basis and the current carry in the futures market. Commercial storage returns remain negative partially due to the additional monthly charge beginning in February (Table 4).

The projected on-farm and commercial storage returns for soybeans are presented in Table 5. 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 -\$0.28/bushel in February 2020 (Table 5). 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 -\$0.56/bushel in February. 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 5 suggest a -\$0.51/bushel return to commercial storage in February 2020 for the most likely basis assumption (Table 5).

Topic 4. Post-Harvest 2019 Corn and Soybean Risk Management Opportunities

Managers storing corn and soybeans to May 2020 may want to consider if the futures or options markets are providing opportunities to protect prices at profitable levels.

Table 6 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 6).

Table 6. Western Kentucky Corn Storage Risk Management to February 2020 for Various Yield Objectives.

Storage Hedge: May 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 @ \$3.86+\$+0.05 basis = \$3.91		-\$0.51	-\$0.27	-\$0.06	+\$0.13
Forward Contract at \$3.97		-\$0.44	-\$0.21	-\$0.00	+\$0.19
Put: \$3.90 strike @\$0.185 = \$3.76 floor		-\$0.65	-\$0.41	-\$0.20	-\$0.02
Strategies Evaluated on:		February 14, 2020			

Table 7. Western Kentucky Soybean Storage Risk Management to February 2019 for Various Yield Objectives.

Storage Hedge: May 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 @ \$9.16 + -\$0.15 basis = \$9.01		-\$4.57	-\$1.96	-\$0.18	+\$1.09
Forward Contract at \$9.08		-\$4.49	-\$1.88	-\$0.11	+\$1.16
Put: \$9.20 strike @\$0.312 = \$8.74 floor		-\$4.83	-\$2.22	-\$0.45	+\$0.82
Strategies Evaluated on:		February 14, 2020			

Table 7 presents risk management alternatives for storing soybeans from harvest to May 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 soybean yield greater than 60-bushels is needed to lock in a profit using forward contracts. Table 7 also demonstrates that farmers harvesting lower yields will be challenged to find profitability at current prices and the assumed costs.

Topic 5. Projected Corn, Soybean, and Wheat Futures Trading Ranges to Harvest 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. Corn Futures Closing Price 68% Probability (Green) and 95% Probability (Red) Trading Range.

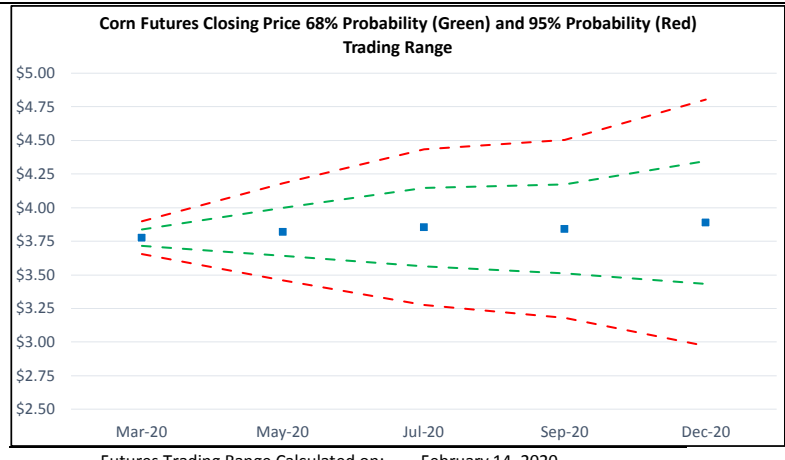


Figure 4 provides the probabilistic trading range for the corn futures contracts from March 2020 to December 2020. There is a 68% probability that the July 2020 corn contract will trade between \$3.57 and \$4.14 and a 95% probability that the July 2020 corn contract will trade between \$3.28 and \$4.43. Managers considering managing price risk for the 2020 crop should monitor the December 2020 contract, which has a 68% probability of trading between \$3.43 and \$4.34 per bushel. The December 2020 corn contract has a 95% probability of trading between \$2.97 and \$4.80 per bushel, which reflects the volatility in the corn futures contracts for the deferred months (Figure 4).

Trading range calculated on February 14, 2020, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 14, 2020, 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.

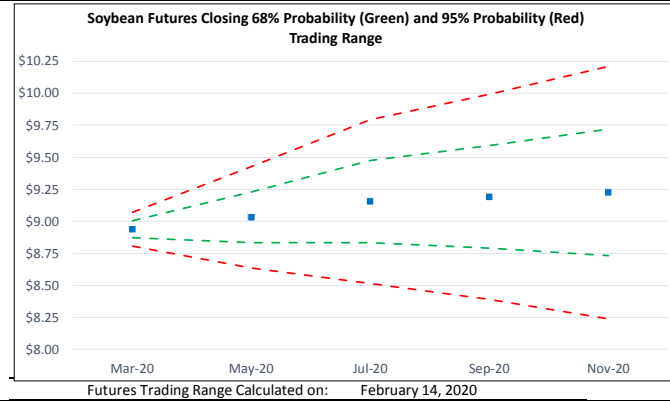


Figure 5 provides the probabilistic trading range for soybean futures contracts from March 2020 to November 2020. Managers planning to store soybeans into late spring should monitor the July 2020 soybean contract. The July 2020 contract has a 68% probability of trading between \$8.84 and \$9.47 per bushel. The November 2020 soybean contract has a 68% probability of trading between \$8.73 and \$9.72 per bushel (Figure 5).

Trading range calculated on February 14, 2020, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 14, 2020, 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.

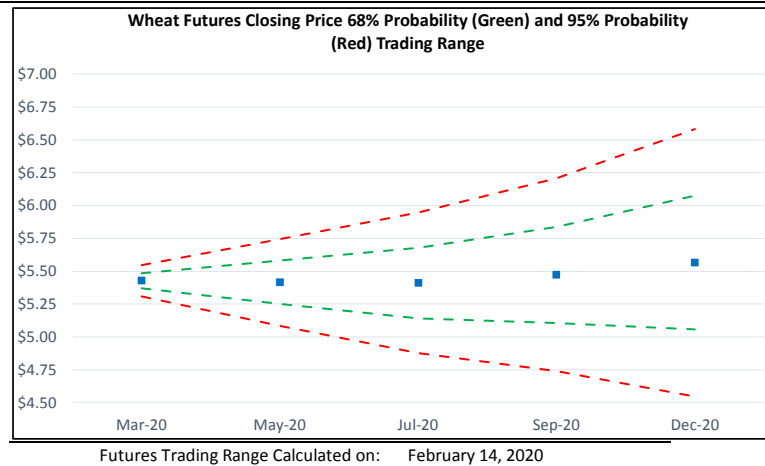


Figure 6 provides the probabilistic trading range for the wheat futures contract from March 2020 to December 2020 contracts. The July 2020 contract has a 68% chance of trading between \$5.14 and \$5.68/bushel. Managers planning to store wheat should monitor the deferred contracts. The December 2020 wheat contract has a 68% probability of trading between \$5.06 and \$6.07/bushel (Figure 6).

Trading range calculated on February 14, 2020, using the average volatility of the previous 21-day period. The 68% probability range is the closing futures price on February 14, 2020, plus and minus one standard deviation. The 95% probability range is the closing price plus and minus two standard deviations.

Topic 6. Pre-Harvest 2020 Corn, Soybean, Wheat and Double-Crop Soybean Risk Management Opportunities

Tables 8-11 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 8. 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 @ \$3.89+ -\$0.30 basis = \$3.59	-\$1.17	-\$0.88	-\$0.61	-\$0.38	-\$0.17	+\$0.02
Forward Contract at \$3.67	-\$1.09	-\$0.79	-\$0.53	-\$0.29	-\$0.09	+\$0.10
Put: \$3.90 strike @\$0.251 = \$3.35 floor	-\$1.41	-\$1.11	-\$0.85	-\$0.62	-\$0.41	-\$0.22
Strategies Evaluated on:	February 14, 2020					

Table 8 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 \$3.59/bushel assuming a -\$0.30/bushel harvest-time basis. The second alternative is to lock in a cash price through a forward contract at \$3.67/bushel. The third alternative is to establish a price floor at \$3.35/bushel by buying a put option with a \$3.90 strike price that costs \$0.251 (Table 8).

Table 8 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 demand increases and continues into the 2020 marketing year, the December 2020 corn futures contract may increase to a price level that provides profitable risk management opportunities for lower expected yields.

Table 9 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 for yields of 60 bushels/acre or greater.

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 @ \$9.23 + -\$0.40 basis = \$8.83	-\$3.00	-\$1.82	-\$0.85	-\$0.04	+\$0.64
Forward Contract at \$8.93	-\$2.90	-\$1.71	-\$0.75	+\$0.06	+\$0.74
Put: \$9.20 strike @\$0.407 = \$8.39 floor	-\$3.43	-\$2.25	-\$1.28	-\$0.47	+\$0.21
Strategies Evaluated on:	February 14, 2020				

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 @ \$5.41 + \$0.15 basis = \$5.56	-\$0.32	+\$0.03	+\$0.34	+\$0.61	+\$0.86
Forward Contract at \$5.63	-\$0.25	+\$0.10	+\$0.40	+\$0.68	+\$0.93
Put: \$5.40 strike @\$0.285 = \$5.27 floor	-\$0.61	-\$0.26	+\$0.04	+\$0.32	+\$0.57
Strategies Evaluated on:	February 14, 2020				

Table 10 illustrates the risk management potential for wheat in 2020. The costs in Table 10 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 to lock in a better return.

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 @ \$9.23+ -\$0.40 basis = \$8.83	-\$2.03	-\$0.68	+\$0.38	+\$1.23	+\$1.92
Forward Contract at \$8.93	-\$1.93	-\$0.57	+\$0.48	+\$1.33	+\$2.02
Put: \$9.20 strike @\$0.407 = \$8.39 floor	-\$2.46	-\$1.11	-\$0.05	+\$0.79	+\$1.48
Strategies Evaluated on:	February 14, 2020				

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 China follows through with their Phase 1 commitment to increase imports of agricultural goods (Table 11).1

Topic 7. 2020 Potential RP Projected Prices and Revenue Guarantees for Corn and Soybeans

The projected prices for revenue protection (RP) insurance for corn and soybeans are currently being determined. RP insurance initial price guarantee is the average of the closing prices for the December and November futures contracts for corn and soybeans, respectively, in February. As of February 14, 2020, the average prices are \$3.92 and \$9.20 for corn and soybeans, respectively. The APH yields in the examples are 185-bushels for corn and 55-bushels for soybeans.

Figure 7 illustrates the potential revenue guarantee from crop insurance, net of the producer paid insurance premium, compared to the corn crop's budgeted cash costs. In this example, inputs are budgeted at \$426 per acre, and cash rent is budgeted at \$185/acre assuming 75% of the land base is rented for a per acre cash cost of \$139/acre. Cash overhead costs are budgeted at \$14/acre for total cash costs of \$579/acre (Figure 7). Managers should remember that the budgets do not include the family living expenses covered by the crop farm. Similarly, the budgets do not provide a return for machinery replacement and may not accurately reflect the annual principal and interest due on intermediate or long-term debt. Figure 7 serves as a reminder that RP insurance can help mitigate liquidity risk and limit reductions in working capital needed to cash flow the farm business.

RP insurance at the 70% level has a deficit of \$76/acre, while the 80% coverage level has a deficit of \$14/acre. The 85% coverage level may cover total budgeted cash costs and would provide the greatest liquidity protection for corn. The best coverage level depends on the farm's working capital availability and the manager's risk tolerance. Those managers that are more risk-averse may prefer the higher coverage level (Figure 7).

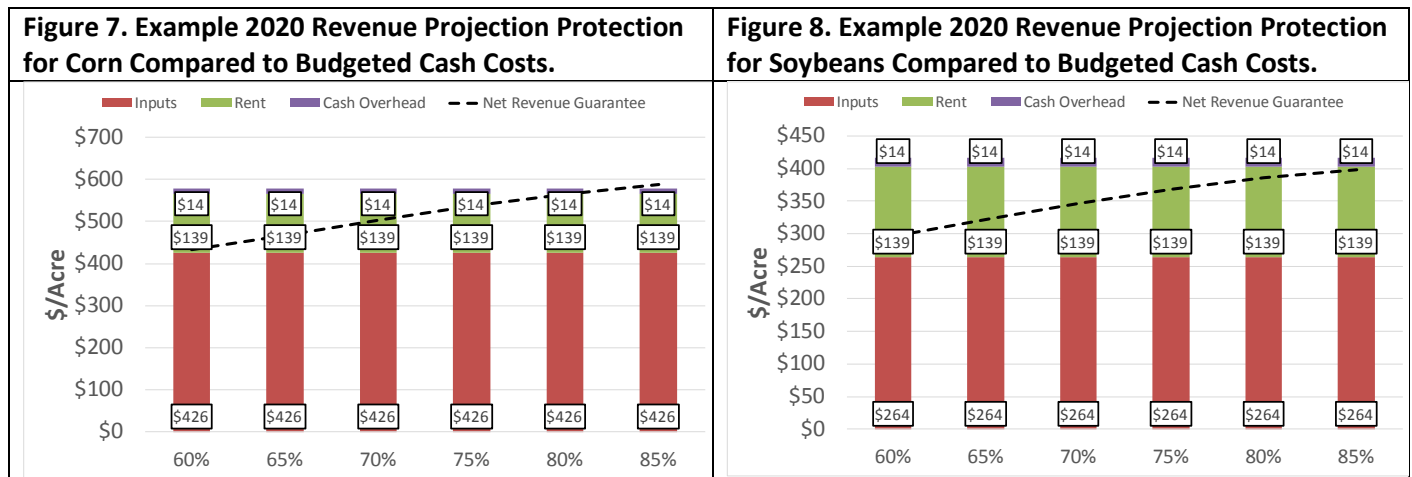


Figure 8 illustrates the risk protection provided by RP insurance for soybeans. Total cash inputs are budgeted at \$264/acre, cash rent of \$185/acre paid on 75% of the land base is budgeted at \$139/acre, and the cash overhead costs are budgeted at \$14/acre for total cash costs of \$417/acre. RP insurance at the 70% coverage level has a deficit of \$71/acre below budgeted cash costs. The deficit at the 85% coverage level is \$19/acre (Figure 8).

Managers that are liquidity constrained may want to consider how RP insurance can limit revenue risk and the impact on cash flow. Managers should continue to preserve working capital as tight profit margins are projected for the 2020 corn and soybean crops.

Topic 8. Combining Crop Insurance and Forward Contracts to Reduce Revenue Risk: Example Game Plans for 2020 Corn, Soybeans, and Wheat

This topic evaluates the potential risk protection provided by combining crop insurance with forward contracts to manage revenue risk for corn (Figure 9), full-season soybeans (Figure 10), wheat (Figure 11), and double-crop soybeans (Figure 12). The examples assume managers only consider the cash costs with farming. For instance, managers plan on covering 100% of inputs at \$426/acre, and 100% of cash overhead costs at \$14/acre. The Kentucky Farm Business Management reports indicate the average grain farm owns 25% of their land base, so these examples assume that managers only pay cash rent of \$185/acre on 75% of the land farmed. Any grain not sold through the forward contract is assumed to be stored and sold after capturing a \$0.25/bushel price appreciation.

The RP crop insurance projected price is assumed to be \$3.92 per bushel and coverage at the 75% level. The marketing plan is to forward contract 50% of expected production (assuming the expected yield of 185-bushels) at \$3.70 per bushel. At a harvested yield of 185-bushel (Figure 9 – green line), the return over budgeted costs is a minimum of \$41/acre at a DEC 20 futures price of \$3.14/bushel (\$2.84/bushel cash). If there is a 10% yield loss (Figure 9 – blue line), the maximum loss is \$6/acre at the DEC 20 futures price of \$3.14/bushel (\$2.84/bushel cash). The lines form a “V-shape” which reflects crop insurance indemnities paid from lower prices or yields. The gold-line reflects a 20% yield loss with the lowest return at \$29/acre at a DEC 20 futures price of \$3.92/bushel (\$3.62/bushel cash) (Figure 9). Because these examples ignore the economic costs that contribute to family living costs or other debt payments, a 20% yield loss would create liquidity problems and likely reduce working capital or increase debt.

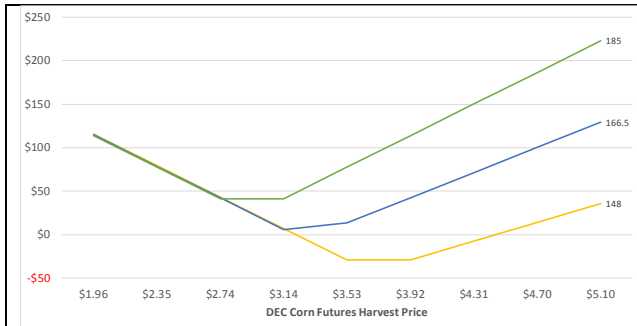


Figure 9. Return over Total Inputs, Land, and Overhead Costs for 2019 Western Kentucky Corn.

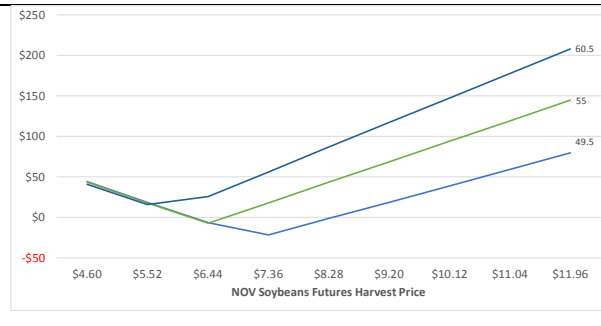


Figure 10. Return over Total Inputs, Land, and Overhead Costs for 2019 Western Kentucky Full Season Soybeans.

The return over total budgeted soybean costs for full-season soybeans is shown in Figure 10. The cost assumptions for the corn examples are applied for full-season soybeans. Total variable costs are budgeted at \$264/acre with rent and overhead the same as for corn. The risk management plan is to purchase RP insurance at the 70% coverage level at a projected price of \$9.20/bushel. The marketing plan is to forward contract 50% of expected production (assuming an expected yield of 55 bushels) at a cash price of \$8.90 per bushel. Assuming a -\$0.40/bushel basis, the November 2019 futures price would be \$9.30/bushel to fulfill this marketing objective.

For the planned yield of 55 bushels/acre (Figure 10 -- green line), the minimum return over budgeted costs is -\$7/acre at a futures price of \$6.44/bushel (\$6.04/bushel cash). If the yield is 60.5 bushels (10% higher), the minimum return of \$16/acre is at a \$5.52/bushel futures price (\$5.12/bushel cash). If yields are 10% lower at 49.5 bushels/acre (Figure 10 – light blue), then returns are negative for a future price of \$8.28/bushel.

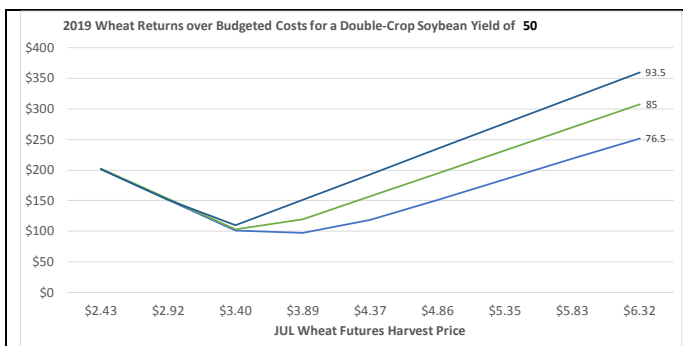


Figure 11. Return over Total Inputs, Land, and Overhead Costs for 2019 Western Kentucky Wheat-DC Soybeans for a Double-Crop Soybean Yield of 50 bushels/acre.

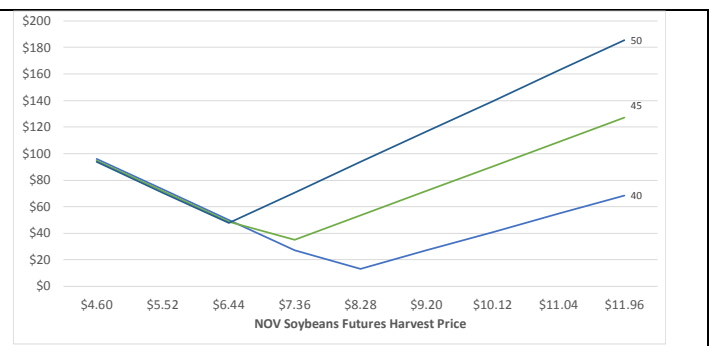


Figure 12. Return over Total Inputs, Land, and Overhead Costs for 2019 Western Kentucky Double-Crop Soybeans.

The risk management plan for wheat presented in Figure 11 assumes RP crop insurance was purchased at the 75% coverage level at the projected price of \$4.86/bushel. The returns over budgeted costs in Figure 11 assume a return for the wheat / double-crop soybean enterprise, assuming a double-crop soybean yield of 50-bushels. The cost assumptions include covering the cash overhead costs and cash rent on the land base that is rented. The return in

Figure 11 is net of the total input costs for wheat and double-crop soybeans. Because wheat prices have been better than typical for the last for crop years, the plan is to forward contract 65% of expected production at \$5.60/bushel. The rest is stored for an expected storage gain of \$0.35/bushel.

The graph of the wheat enterprise returns over budgeted costs also includes the revenue from the double-crop soybeans at a yield of 50 bushels/acre. Double-crop soybean revenues are included in the graph to demonstrate how soybean revenue reinforces wheat profitability. For the planned yield of 85-bushels or larger, the wheat/double-crop soybeans enterprise is profitable with the minimum return of \$103/acre at a JUL 20 wheat price of \$3.40/bushel. Even with a 10% yield loss for wheat (76.5 bushels/acre), the enterprise is profitable with the minimum return over total costs of \$98/acre at a \$3.89 JUL 20 price (Figure 11)




Figure 12 shows the full-season soybean risk management plan applied to the double-crop soybean enterprise. The double-crop soybean plan assumes the same RP coverage level as full-season soybeans, and the same percentage forward contracted at the same price as full-season soybeans. Because of the lower cost structure, locking in a large percentage of expected production at \$8.90/bushel in the spot market buoys the wheat enterprise. Figure 12 is shown to remind managers of the importance of locking in favorable margins when they exist.

The purpose of this article is to demonstrate how risk management tools can be combined to protect revenue. Unfortunately, there is not a silver bullet cure to provide 100 percent risk protection. Managers should calculate how much working capital is available and gauge how much risk can be absorbed by the farm business. The risk that cannot be absorbed by the farm business should be passed to the insurance market and price risk tools.

Also, remember the seasonality of the corn and soybean market and consider that sometimes better pricing opportunities have occurred in February with the potential of another chance due to production risk from May to July. I encourage you not to pass up a good opportunity now in hopes of something better in the future, especially if liquidity is a problem with your farm business.

Topic 9. 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 U.K. 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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