

MESSENGER-INQUIRER



March 25, 2023

Sensitivity of USDA's 2023 Ag Outlook Forum Projections to Yield

At Ag Expo in January, I was excited to introduce Dr. Grant Gardner Assistant Extension Professor in the Department of Agricultural Economics. His primary focus will be in grain marketing, crop insurance, and government programs. The following article was written by Dr. Gardner discussing information provided at the 2023 USDA Ag Outlook Forum held at the end of February in Arlington, Virginia.

Stocks to use is the ratio of end-of-year commodity stocks over total commodity use. The USDA releases estimates on commodity supply, demand, exports, and imports, all of which are accounted for in the stocks-to-use ratio. As yield projections have a large margin of error in February, trendlines estimate future yield, which typically result in a higher yield projection than the previous year. Results indicate that soybean stocks-to-use ratios are extremely sensitive to changes in yield which may indicate soybean price volatility.

One limitation of this analysis is that we assume the USDA projections for harvested acres are correct, meaning the changes in production levels only come from missed yield projections. Change in harvested acres could offset yield-driven production changes. The

MESSENGER-INQUIRER

analysis also does not consider potential changes in use that may occur as market conditions evolve.

The stocks-to-use ratio is typically given as a percentage and uses a simple calculation to quantify the estimated level of stocks at the end of the market year and the total crop demand. Stocks-to-use is a crucial measure in commodity marketing, providing some perspective on supply and demand for the commodity of interest. Higher stocks-to-use ratio levels suggest that the market has more cushion to absorb supply shocks, while lower stocks-to-use indicates that there is very little room for the market to handle decreases in production. Lower stocks-to-use ratio levels also mean that commodity prices are more sensitive to demand shocks.

For the 2023 projections, a one-bushel change in U.S. average yield for corn and soybeans would change the stocks-to-use ratio by 0.57% and 1.94%, respectively. These results show that USDA projections are much more sensitive to changes in soybean yield than corn yield. Soybean stock-to-use ratio is more sensitive because of historically low projections for soybean ending stock levels. Additionally, a one-bushel change in soybean yield results in a much larger percentage of missed bushels due to soybeans producing fewer bushels per acre than corn.

The current USDA projection for 2023 average corn yield is 181.5 bushels/acre, which results in a projected stocks-to-use ratio of 13% and a price forecast of \$5.60/bushel. Over-estimation of yields by the USDA could indicate stocks-to-use and prices closer to 2021 or 2022, depending on how many bushels the actual average yield is under the projection. If actual yield exceeds USDA projections, the stocks-to-use ratio would increase, likely causing prices to fall under \$5.60/bushel.

MESSENGER-INQUIRER

Analysis of soybean yield tells a more exciting story. The USDA is projecting an average soybean yield of 52 bushels/acre, stocks-to-use of 6.44%, and an average price of \$12.90/bushel for 2023. If the average soybean yield is just one bushel short, and harvested soybean acres projections are accurate, the stocks-to-use ratio falls to 4.5%, which has not occurred since 2012, when the drought caused supply shortages and soybean prices of \$14.40/bushel. Further thinning of soybean yield could push soybean prices closer to 2012 levels.

In conclusion, USDA Ag Outlook Forum projections indicate that the soybean stocks-to-use ratio is more sensitive to over projection of yield than corn. These results may show a possible upside to soybean prices if planted and harvested acres are correct, but the average yield is over-projected, or vice versa. USDA planted acre projections will become more accurate as spring planting progresses, giving additional insight into how yield misses could affect stocks-to-use for corn and soybeans. Outlook Forum Projections can be found at <https://www.usda.gov/oce/ag-outlook-forum/commodity-outlooks>.

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate based on race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, or physical or mental disability. UNIVERSITY OF KENTUCKY, KENTUCKY STATE UNIVERSITY, U.S. DEPARTMENT OF AGRICULTURE, AND KENTUCKY COUNTIES, COOPERATING