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Recent Disruptions and World Consumption of Corn, Soybeans, and Wheat

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Since President Trump announced his tariff war in early 2018 (*farmdoc daily* July 31, 2018), a series of disruptions have impacted US and world agricultural markets. Besides the tariff war, they include

a major outbreak of African Swine Fever (ASF) in China,

a worldwide COVID-19 pandemic,

a major outbreak of Avian Flu in the US,

Ukrainian-Russian War, and

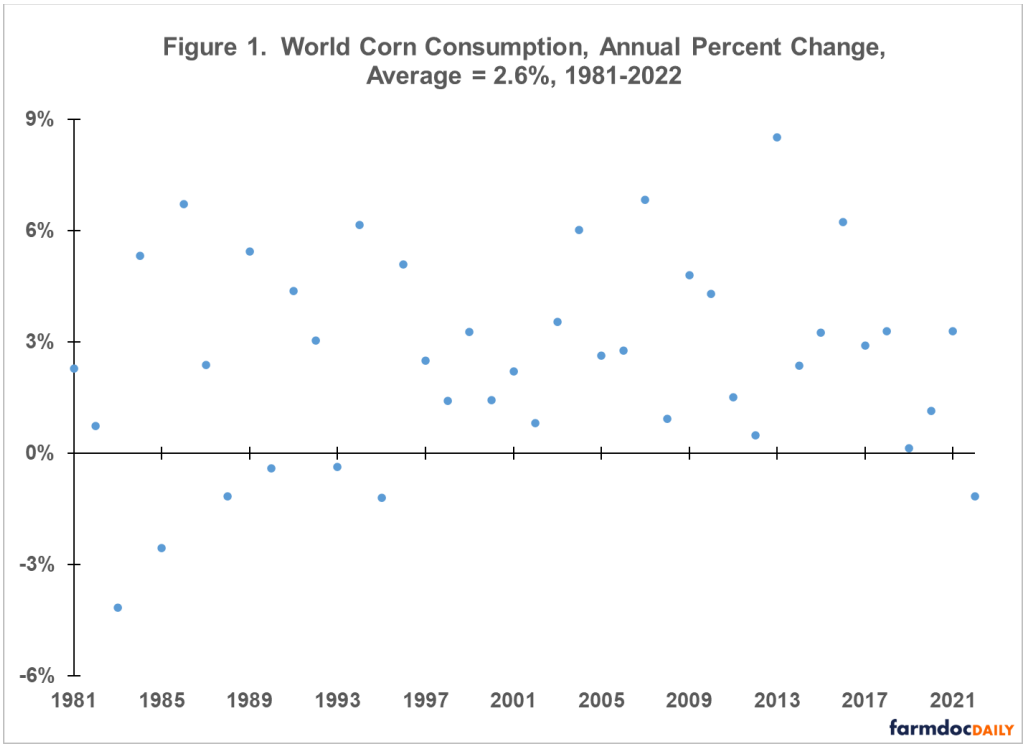
weather events around the globe, including drought, wet planting, and natural disasters.

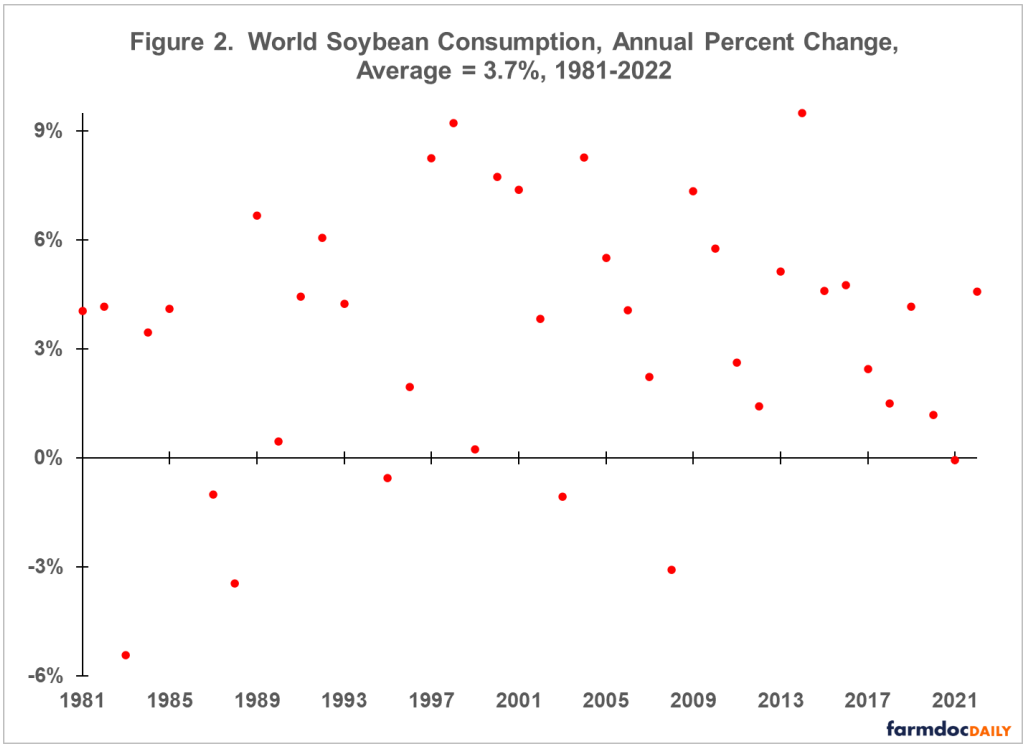
This article examines if world consumption of corn, soybeans, and wheat have deviated from historical trends since 1980 during this era of disruption. So far, recent world consumption is not out of line with the post-1980 period. However, cumulative effects that have not yet materialized cannot be ruled out. In particular, world corn consumption should be monitored.

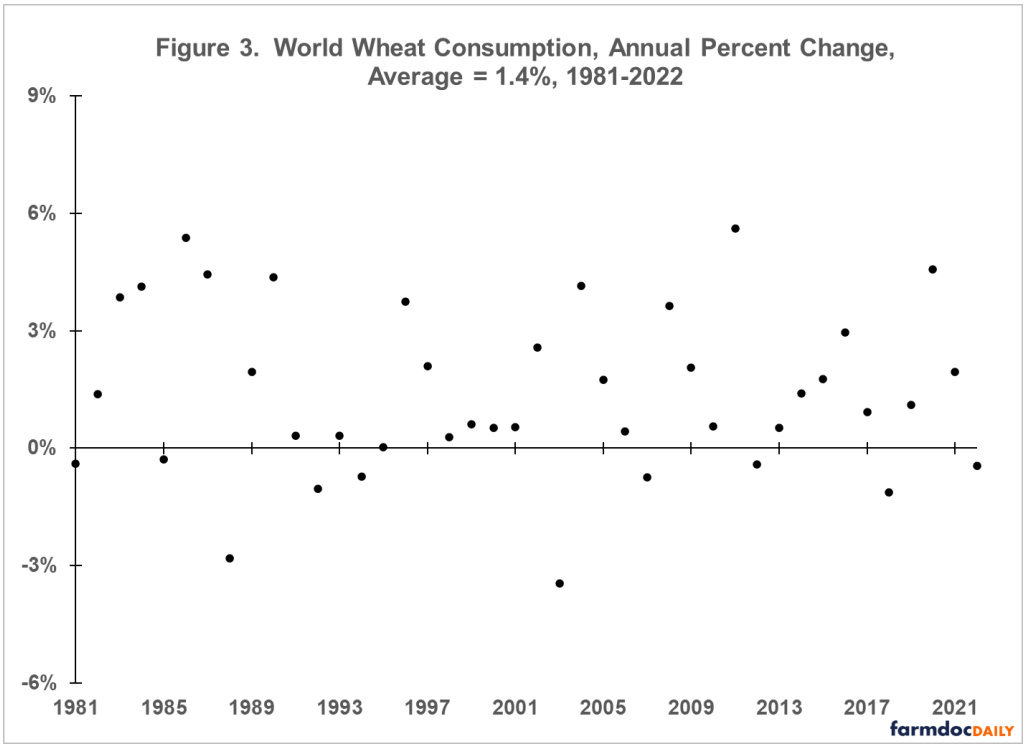
Data: The data in this article are from the US Department of Agriculture, Foreign Agriculture Service website, *Production, Supply, and Distribution Online* (PSD). The analysis begins with the 1981/1982 crop year. This starting point follows the end of the 1970 period of prosperity, a period when price volatility increased due to changes in markets and US farm policy. These changes included increased international trade, lower US price support floors relative to market prices, fewer public stocks, and creation of deficiency payments. Moreover, several countries were added to PSD during the 1970s.

Year-to-Year Percent Change in Consumption: Annual percent growth in world consumption has averaged 2.6% for corn, 3.7% for soybeans, and 1.4% for wheat since 1980 (Figures 1 -3). No trend in annual percent change is evident for any of the three crops. Since the 2016/2017 crop year, world consumption has contracted year-over-year only twice: a -1.1% decline in world wheat consumption in 2018/2019 and a forecasted -1.1% decline in world corn consumption in the current 2022/2023 crop year.

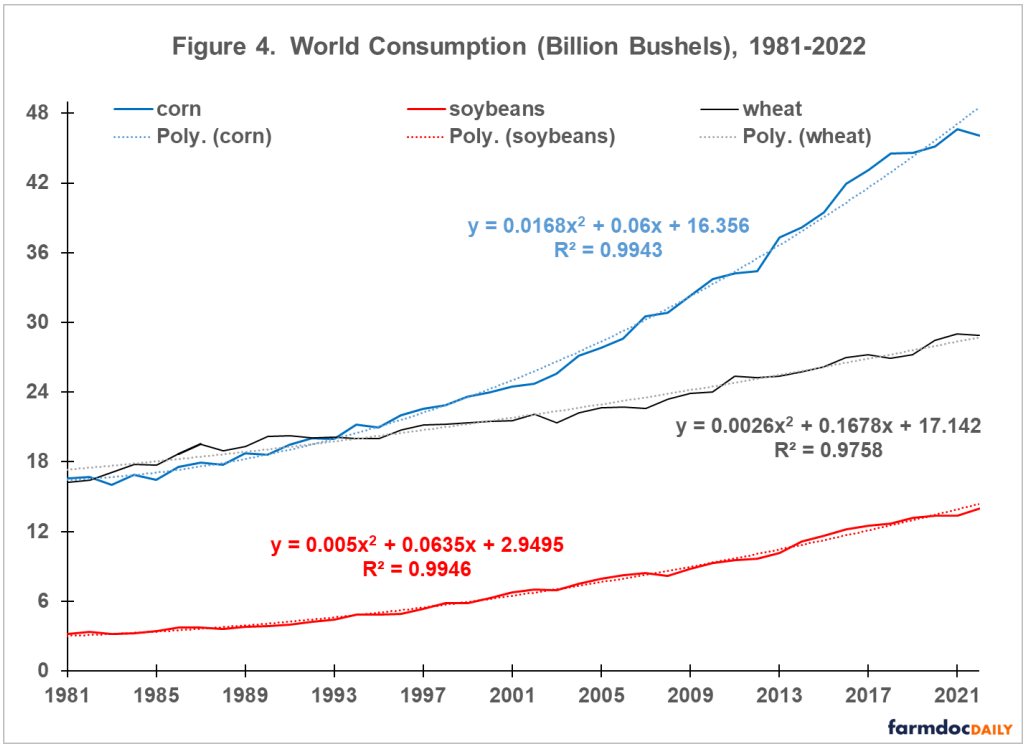
World soybean consumption did not decline in any year post 2016/2017 but did increase only +0.1% in 2019/2020. More broadly, since 1980, world consumption has declined more than -1.5% in only 7 of the 123 crop and year observations. World consumption last declined more than -1.5% in 1985/1986 for corn (-2.6%), 2008/2009 for soybeans (-3.1%), and 2003/2004 for wheat (-3.4%).



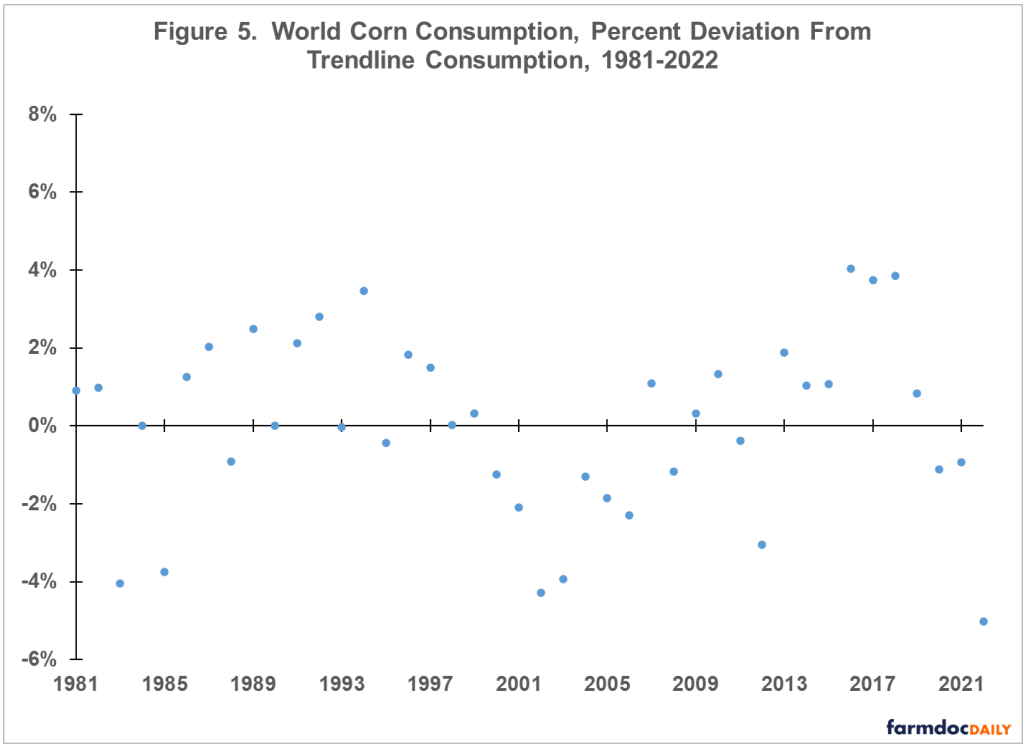


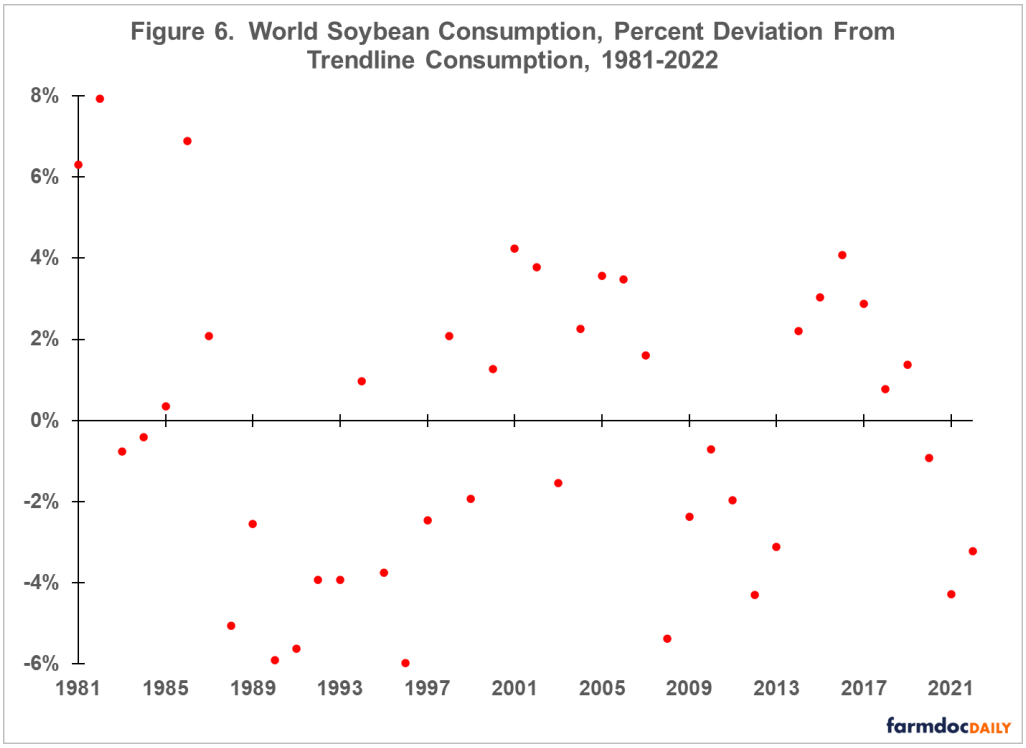


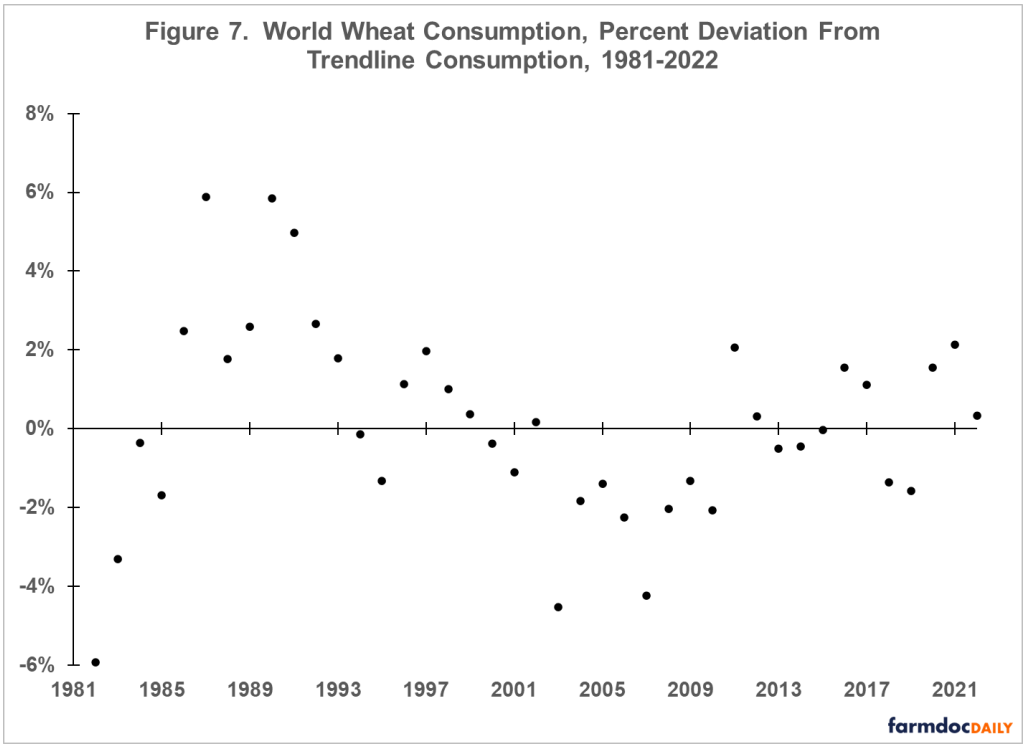
Consumption Trends since 1980: Another perspective on year-to-year variation is deviation from a historical time trend. World consumption of corn, soybeans, and wheat since 1980 has followed a 2nd degree polynomial time trend (i.e. linear and squared time variables) (see Figure 4). Lowest explanatory power is 98% for wheat (100% is a perfect fit). The estimated 2nd degree polynomial time trend for each crop indicates trend consumption, when measured in bushels, has grown each year (linear term is positive) with the amount of growth becoming larger over time (squared term is positive).



Deviation from Trendline: Deviations of world consumption from trendline consumption since 2016 do not appear to be out-of-line with the post-1980 deviations with one possible exception. The possible exception is that world corn consumption will be -5% below trend in the current 2022/2023 crop year. If realized, this would be the largest shortfall in corn consumption relative to trend since 1980. Otherwise, the share of deviations above and below trendline consumption are similar for the entire post 1980 period and the more recent post 2016 period: 51% above and 49% below trendline consumption post 1980 vs. 56% above and 44% below post 2016 (see Figures 5-7). Above and below trend deviations also cluster in both periods. For example, over the 2000/2001 through 2006/2007 crop years, consumption was below trend all 7 years for corn, below trend 6 years for wheat, and above trend 6 years for soybeans. Since 2016, corn and soybean world consumption was above trend the first three crop years but below trend the last three crop years. Wheat consumption was below trend in 2018/2019 and 2019/2020 but above trend the last three crop years.







Summary

World consumption of corn, soybeans, and wheat does not appear to have been disrupted despite a series of major disruptions in world economic and agricultural markets since early 2018.

This finding is a testament to the world-wide nature of agricultural production and its ability to respond to unexpected events by increasing production in non-affected areas and adjusting, even reinventing, logistical supply lines.

Various areas of the world have, however, been harmed by one or more of the major disruptive events.

Cumulative effects on world consumption could become evident moving forward. In particular, world corn consumption should be monitored.

References and Data Sources

Swanson, K., J. Coppess and G. Schnitkey. "Trade Timeline and Corn and Soybean Prices." *farmdoc daily* (8):141, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, July 31, 2018.

US Department of Agriculture, Foreign Agriculture Service. 2022, October. Production, Supply, and Distribution Online. https://apps.fas.usda.gov/psdonline/