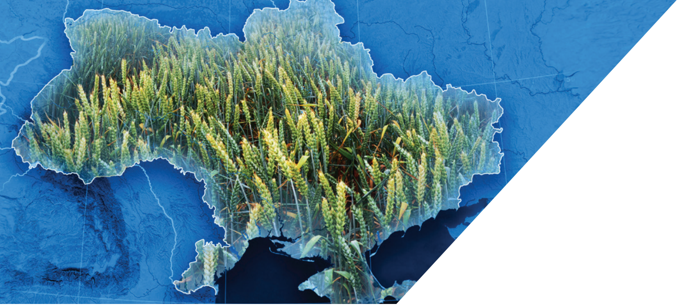

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Ukraine Grain: Tight Stocks, Price Volatility Likely for Years

Kenneth Scott Zuckerberg
Lead Economist,
Grain and Farm Supply

Inside…

Key Points:

- Global grain markets have been managing through a period of extreme price volatility following Russia's military invasion of Ukraine. While markets are somewhat calmer now vs. three weeks ago, CoBank sees tight stocks-to-use and price volatility continuing for at least two growing seasons. This report focuses on two major grain crops that Ukraine exports: corn and wheat.

- Our base case assumes reductions to Ukraine's current year plantings of corn and wheat and a smaller winter wheat harvest in July/August. These assumptions result in a tightening in available stocks-to-use ratios for both commodities. Our forecast calls for corn available stocks/use decreasing from 6.6% in 2021-22 to 4.0% in 2022-23, and wheat decreasing from 15.0% to 10.5%, respectively ("available" stocks exclude Ukraine and China).

- In the near-term, we see India, Europe, and Australia filling some of the expected shortfall in Ukraine's wheat exports to the Middle East and North Africa, while the U.S., Brazil and Argentina should be able to pick up the majority of the corn export slack.[1] We acknowledge that Russian wheat and corn exports could also decline due to trade finance restrictions, but have purposely excluded Russia from this analysis.

- Balancing all factors, grain prices and volatility are both likely to remain elevated (regardless of when the war actually ends) as markets continually assess real and perceived grain supply shortages and re-adjust risk premiums. High fertilizer prices, crop chemical shortages, and ongoing supply chain problems will contribute to the volatility.

- The current and expected volatility in grain trading has immediate financial implications for U.S. grain cooperatives and multi-national grain traders. It will require higher capital levels and excess liquidity to fund the acquisition and storage of grain and cover increased hedging costs.

EXHIBIT 1: Ukraine Planting Calendar

Crop	Planting Month(s)	Harvest Month(s)
Barley	March and April	July and August
Corn	April and May	September to November
Soybean	April and May	August and September
Sunflower Seed	April and May	September and October
Winter Wheat	September and October	July and August

Source: USDA Foreign Agricultural Service

Introduction

Global grain markets have been managing through a period of extreme price volatility following Russia's military invasion of Ukraine, a situation that has reignited the grain rally of 2020-21. The volatility is logical, given the Black Sea region's importance for wheat, corn, and other ag commodities. Fertilizer markets have also been quite volatile, with prices reaching decade-high levels due to Belarus and Russia's large export market shares for nitrogen, phosphate, and potash fertilizers. The war comes at a tenuous time for Ukraine given the normal planting calendar, thus creating a risk for crop production and grain exports. We see the situation negatively impacting global grain flows for at least two crop seasons, due to the following:

- Ukraine plants corn, sunflower, and barley between March and May *(Exhibit 1).* The spring 2022 season will obviously be interrupted as long as the war continues, with a material decline in planted acres. The key questions, currently unknown, are: how much of each crop can be planted, how much can survive, and how much, if any, will be harvested later in 2022 and available for domestic and export purposes.[2]
- Ukraine's winter wheat crop, currently emerging from dormancy, will be difficult to harvest this summer if military activity continues. And should the conflict last more than six months, next year's winter wheat crop may not get fully planted during the September/October planting window.
- Finally, even if a durable peace treaty is signed, there is growing risk that Ukraine's 2022 planted acreage and yields will decline materially with damaged infrastructure, losses of agricultural equipment and machinery, and/or a lack of affordable inputs – most notably, fuel, fertilizer, seed, and crop chemicals.

The war in Ukraine is a fluid, extremely complicated situation that makes broad economic and sector-specific forecasting difficult. Therefore, we have narrowed our focus to assess the likely duration of global grain market disruptions in general, what that means for prices of wheat and corn (two of the world's major crops), and the implications for grain cooperatives, elevators, and merchandisers based in the United States. We will address implications for fertilizer and sunflower oil export disruptions separately in our upcoming quarterly report and in future publications.

Situational Assessment

The Black Sea region is a major global producer and exporter of wheat, sunflower oil, and to a lesser extent, corn *(Exhibit 2).* Russia and Ukraine account 14% of global wheat production and 29% of global wheat exports based on trailing five-year averages. While the two nations produce only 4% of global corn supplies, they account for 17% of corn exports. Russia and Ukraine are also major producers and exporters of sunflower oil, accounting for 58% of total global production and 77% of exports. Although this report does not comment in detail about what potential disruptions in Black Sea sunflower oil exports could mean for global oilseed markets, it is clear that an already tight vegetable oil market will tighten further.

EXHIBIT 2: Comparision of Wheat, Corn and Sunflower Oil Production

	Russia	Ukraine	Russia + Ukraine	United States
WHEAT				
World Production	10.3%	3.7%	14.0%	6.5%
World Exports	19.0%	9.5%	28.5%	13.0%
CORN				
World Production	1.2%	3.0%	4.2%	32.2%
World Exports	2.4%	14.5%	16.9%	33.1%
SUNFLOWER OIL				
World Production	25.7%	32.7%	58.4%	1.0%
World Exports	26.4%	50.2%	76.6%	0.4%

Source: USDA Foreign Agricultural Service

Base Case Analysis

Our base case assumes significant reductions to Ukraine's spring corn crop, a smaller wheat harvest this summer, and smaller wheat plantings in the fall. The result for crop year 2022-23 will be declines in global "available" stocks/use ratios from 6.6% to 4.0% for corn, and from 15.0% to 10.5%. For the purpose of our analysis, we use available stocks, defined as world ending stocks minus Ukraine and China, to better understand the war's impact on the rest of the world (we exclude Ukraine, since it is the subject country, as well as China, the most populous nation on the planet, because its large stocks are held in reserve for the purpose of internal consumption).

The available world stocks/use ratios for both corn and wheat, as well as the underlying assumptions we made that resulted in the estimated stocks/use ratios for the 2021-22 and 2022-23 crop years *(Exhibits 3 and 4)* are as follows:

Corn Assumptions:

- 25% of Ukraine corn produced for the 2021-22 crop year, slated for export, will be lost or destroyed
- Only 50% of the expected Ukraine 2022-23 crop will be planted
- Global corn production excluding Ukraine will increase by 2.9%, equal to the 10-year compound annual growth rate

Wheat Assumptions:

- Only 50% of Ukraine's 2021-22 crop will get harvested during summer 2022
- 75% of Ukraine's expected 2022-23 will be planted in fall 2022
- Global wheat production excluding Ukraine will increase by 1.1%, equal to the 10-year compound annual growth rate

Other Assumptions

- Grain exports out of Ukraine remain choked due to war-related suspensions of commercial Black Sea port loadings and limited rail transportation along the nation's western borders. While the situation could change with a ceasefire, we assume that disruptions will continue over the next six months.

Note: We have excluded potential disruptions to grain production and exports from Russia from the above analysis on purpose, though we recognize there is a high probability that Russian grain exports will decline during 2022 and 2023 due to trade finance restrictions (i.e., sanctions), higher ocean freight insurance requirements, and backlogs that will likely create transportation bottlenecks in the future.

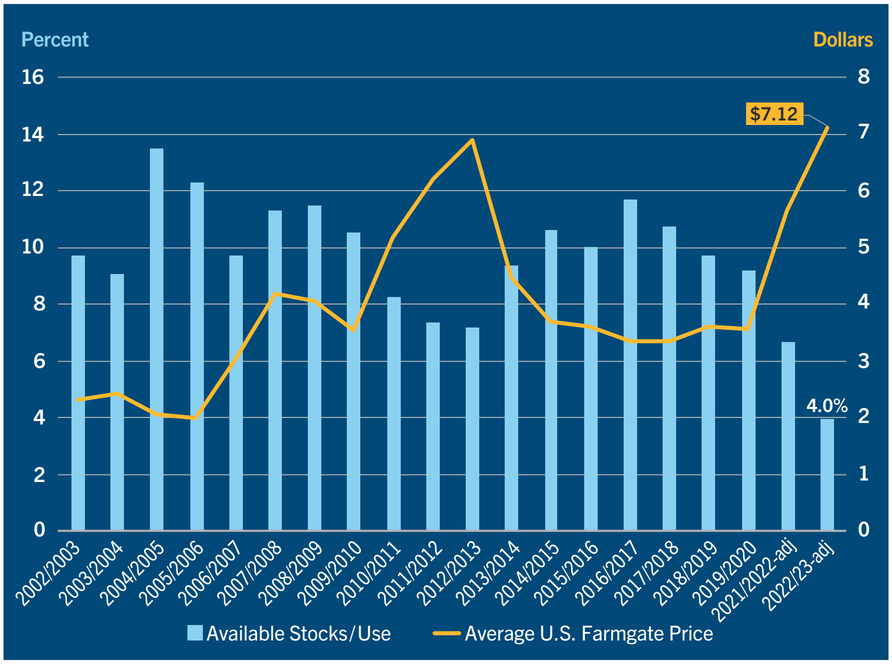
CoBank Customer Implications

As grain prices rise, elevators have opportunities to book profits on owned grain inventories purchased at lower cost-basis. However, higher capital will be required for grain purchasing, storage, and hedging. Similar to what the industry experienced during the 2020-21 grain run, it is critical for grain cooperatives to maintain ample if not excess liquidity to take advantage of short-term

grain buying opportunities and to adequately hedge long positions. Larger multinational grain exporters and traders will also require higher capital levels to fund their operations, but will also need to carefully analyze and manage counterparty credit risk given the likely increase of grain trade with emerging market participants (East Asia, Sudan, Turkey, etc.). This risk could be magnified in the current environment of high inflation, lower global growth, and rising interest rates.

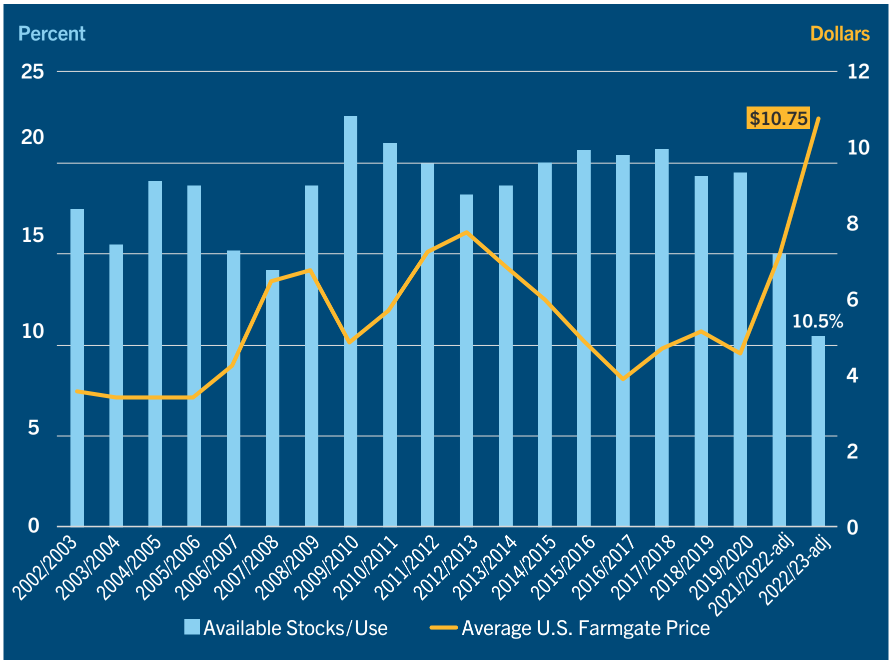
There are additional first, second, and even third order effects (negative and positive) stemming from the shock of recent events that may not be known for several years. Together with COVID, the war in Ukraine serves as a "wake-up call" to grain importing-dependent countries – especially those in the Middle East and North Africa (MENA) – whose food security is severely threatened due to current events. MENA nations will need to reduce their dependence on Russia and Ukraine to manage food insecurity, something that over the long-run should benefit developed grain markets in North and South America, Europe and Australia.[3] Interestingly, it appears that India could benefit the most in the short run. Industry channel checks suggest that India (typically a net importer of grain) could sell some of its excess wheat stocks to countries such as Turkey, Egypt and Tunisia, where Black Sea wheat imports represent 75%, 70% and 52% of each respective country's needs.

EXHIBIT 3: World Corn Impact Analysis



Source: USDA Foreign Agricultural Service.

EXHIBIT 4: World Wheat Impact Analysis



Source: USDA Foreign Agricultural Service.

Conclusions

Russian's military invasion into Ukraine has caused a series of short-term shocks to global commodity markets in general and agricultural commodities in particular given the Black Sea region's importance in wheat, corn, and sunflower oil and fertilizer exports. While impossible to predict the war's duration or conditions for an enduring peace (or at minimum, a standstill), we see the event being highly disruptive to global grain trade for at least two growing seasons, and likely longer.

Our base case assumes major reductions in current plantings of Ukraine corn and wheat, a smaller winter wheat harvest, and lower crop yields, all of which collectively result in a meaningful hit to expected Ukraine grain exports.[4] While the situation is manageable and will sort itself out over time as other crop producing regions respond, our work points to a significant tightening in available stocks-to-use ratios for both corn and wheat. We believe that grain prices will remain elevated and volatile, as markets continually assess commodity supply-demand imbalances, re-adjust risk premiums, and engage in price discovery. Such an environment will require U.S. grain cooperatives and exporters to maintain high levels of capital and excess liquidity to fund both operational and risk management activities.

References

[1] *Hogan, Michael and Trompiz, Gus. "Grain exporters tap EU supplies as war shuts Ukraine ports." Reuters, February 25, 2022.*

[2] *Good, Keith. "Planted Acres in Ukraine Could Fall By Half." Farm Policy News, March 23, 2022.*

[3] *Gelski, Jeff. "FAO leader: Ukraine invasion means countries need new grain sources." World-Grain.com, March 16, 2022. https://www.world-grain.com/articles/16628-fao-leader-ukraine-invasion-means-countries-need-new-grain-sources*

[4] *Good, Keith. "Even if Fighting Stops, Yields Could Suffer as Input Worries Loom." Farm Policy News, March 7, 2022.*

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