

U.S. Commodities Markets

Invasion of Ukraine Threatens to Create Global Corn Supply Shocks

Russia's invasion of Ukraine has brought the region's position as a global leader in grains and oilseed production to the front of the global agricultural discourse. Responding to the threat of a wheat and corn supply shock, the "hot money" hastily flowed into global commodities futures markets. French and U.S. wheat were the immediate beneficiaries, on both a relative and fundamental basis, and the price reaction of U.S. corn futures lagged.

The inability of Ukraine to export old crop MY 21/22 corn combined with the uncertainty of the country's ability to produce a MY 22/23 crop can create short and medium-term global corn and food supply shocks. In addition to these emerging global supply shocks, we see increasing global production costs, uncertainty of exportable corn supplies in Argentina and Brazil as additional catalysts to a surge in U.S. prices.

We believe that a Ukrainian driven global food crisis will cause a systemic shift in the global corn export regime, one where the U.S. would emerge as the net beneficiary. In our view, uncertainties about the supply of global feed grains have the potential to price July '22 at \$8.25/bu and December '22 at \$7.50/bu.

Ukraine is the World's Fourth Largest Corn Exporter

Compared to 2010, Ukraine's corn production doubled to 41.9 mmt while exports increased from 12.7 mmt to 27.5 mmt. As Ukraine's prominence in the global corn market expanded, the country's exports displaced U.S. corn in the EU, Middle East, and North and West African countries. Ukraine has also become a key supplier to China as, according to Chinese Customs data, since 2015 Ukraine represented 68% of its annual corn imports. While this figure has compressed since the U.S./China trade deal was signed in 2020, Ukraine remains a key supplier to the country.

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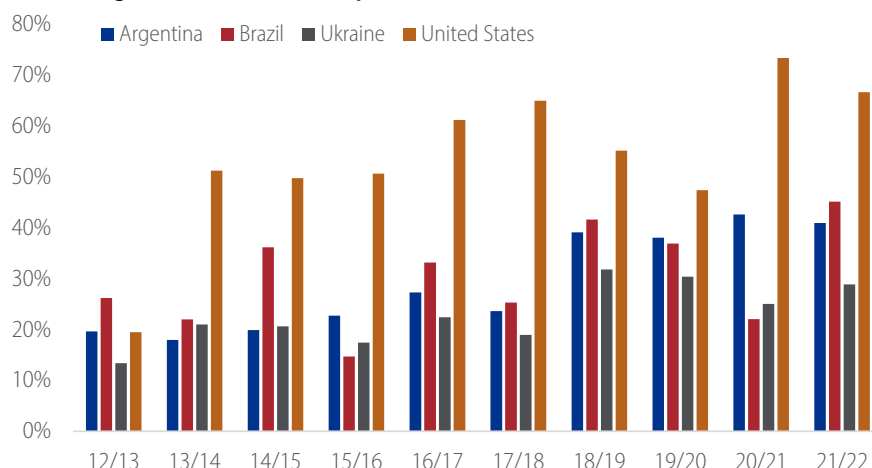
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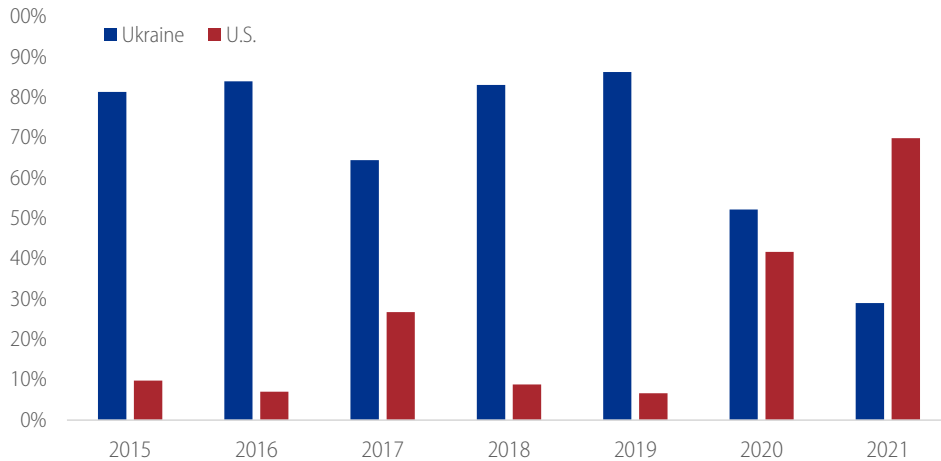
Percentage of Global Corn Exports



Source: USDA

Please see disclosure starting on page 7.

Annual Chinese Corn Imports



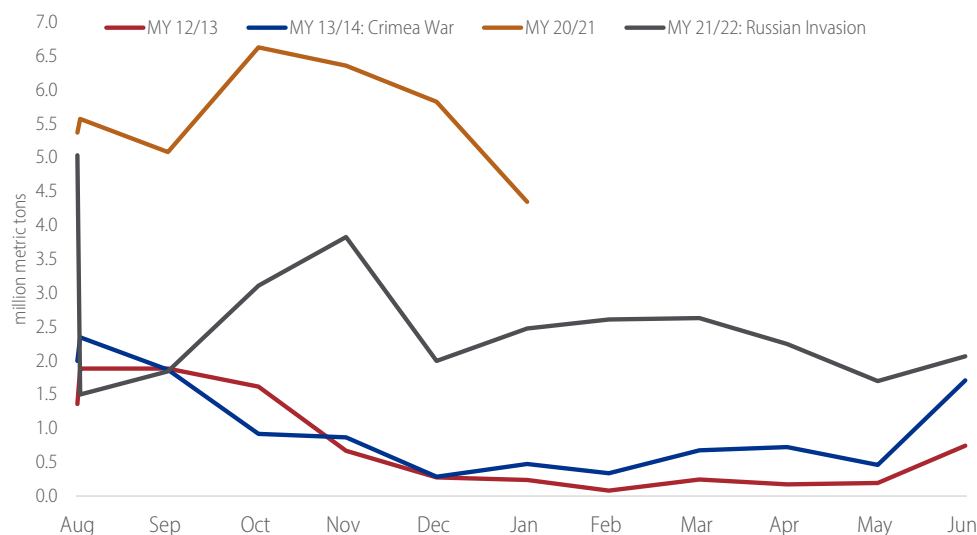
Source: China Customs

Export Disruptions in 2022 will be More Severe Than 2014

2014's events in Crimea are not a good guide for assessing Ukraine's export disruptions this time around. Since the Russian invasion began, fighting has been active in and around key Ukraine agricultural ports that include: Chornomorsk, Mikolayiv, Odessa, Kherson and Yuzhny. Responding to the armed conflicts, the Ukraine government closed the ports to all commercial maritime activity. The lack of Ukraine export activity during 2022 is a stark departure from 2014 when Russia annexed Crimea. In 2014 the military conflict also occurred during February and March. While the scope in 2014 was narrower than the current campaign, data from UkrAgroConsult shows that despite the military activity, Ukraine's agricultural export program during Q1-14 was +84% YoY while total H2-14 agricultural exports were +145% YoY.

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Monthly Total Ukraine Grain Exports



Source: Bloomberg

Acute Domestic Supply Chain Disruptions

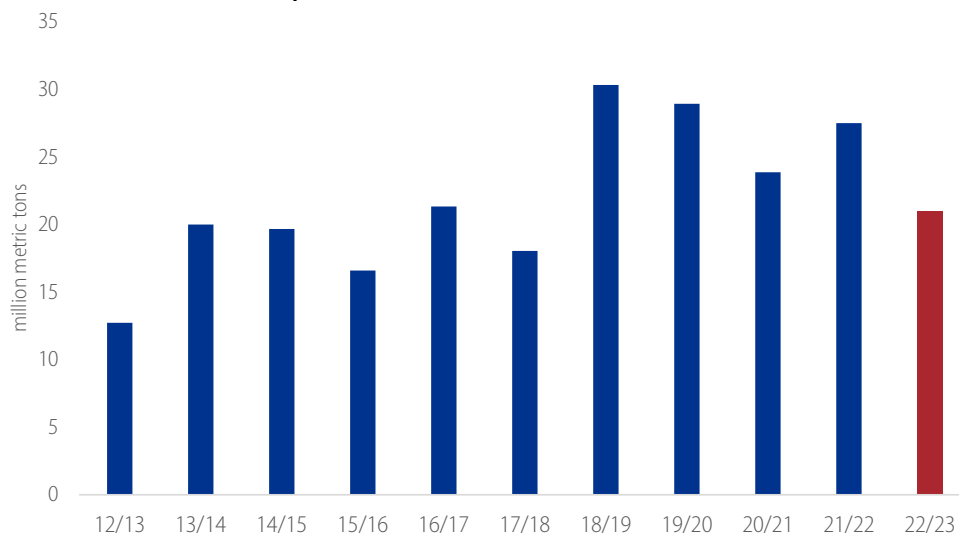
Ukraine's domestic agrisupply chain is experiencing acute disruptions which has stopped the flow of agricultural commodities. To reduce the risk of human casualties, multinational agriprocessors including ADM, Cargill along with locally owned grain merchandizer and exporter Kernal Holding SA have closed upstream elevators and midstream grain exporting operations with unknown reopening dates. Reports from Bloomberg have mentioned that portions of the domestic rail infrastructures leading to major cities and port terminals have been destroyed by the Russian army. These agrisupply chain closures are creating the early-stage global feed grain and corn supply shock which is pushing global FOB prices higher and forcing a realignment of export originations.

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Lack of Fertilizers Will Exacerbate Ukraine's Production Challenges

Russia is a major global and local supplier of the three primary fertilizer inputs: Nitrogen (N), Phosphate (P), and Potassium (K), (NPK). In the absence of trade between Russia and Ukraine, a material contraction in Ukraine's MY 22/23 corn yield is to be expected. Add below trend corn yields to a contraction in planted/harvested acres and we find SovEcon's and IMC SA's production estimates to be credible. If corn production falls to 27.7-21.0 mmt exports can decline to 13.6-18.0 mmt.

Annual Ukraine Corn Exports



Source: USDA

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Ukraine's MY 22/23 Grain Output will Reshape Global Trade

Ukraine's MY 22/23 grain production is a critical question that can reshape the global corn trade. To date, the armed conflict between Ukraine and Russia is taking place in the key Ukraine corn producing states of Chernihivska, Sumska, Kyivska, Kharkivska and Polatavksa. According to USDA's FAS, these regions produce 44% of the country's corn crop. While the military battles appear to be confined to urban areas, and around other strategic targets, we believe that logistical disruptions to the domestic agrisupply chain combined with labor shortage, dangerous working conditions, farmland that is occupied by the Russian army, tight diesel fuel supplies and a lack of inputs (fertilizers and pesticides) will severely limit the country's MY 22/23 agricultural production potential.

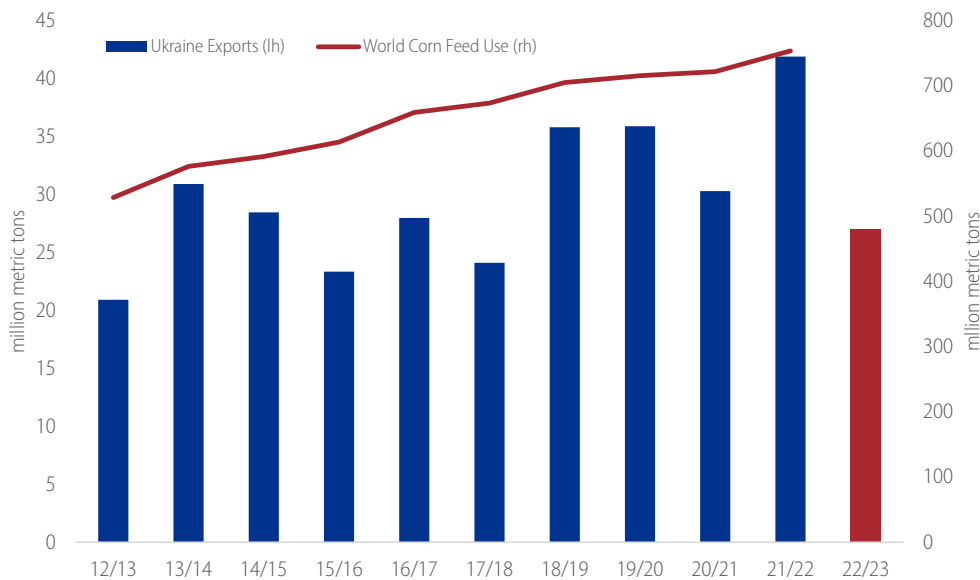
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Ukraine's Corn Production and Exports Will Fall Precipitously

The United Nations estimates that 20-30% of fields used to plant corn, winter wheat and sunflower will go unplanted in MY 22/23. On March 12, 2022 the CEO of Ukrainian agribusiness IMC SA mentioned in Bloomberg "[that] summer crops such as corn could be affected more severely with only about half of the normal acres planted." SovEcon, a leading regional agriconsulting firm, estimates that Ukraine's MY 22/23 corn production could fall to 27.7 mmt from 42.0 mmt, -34% YoY. Ukraine's war-time policies are emphasizing domestic food security. More corn at home for feed use translates to less corn for export. The International Grains Council (IGC) estimates that Ukraine's exports at 21.0 mmt down from 31.9 mmt, -46% YoY.

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Annual Ukraine Corn Exports and World Corn Feed Use



Source: USDA

Increasing global corn demand when exports are falling can realign the global export regime and translate to increased U.S. exports.

La Nina Poses Challenges to Argentina's and Brazil's Corn Crops

Because the southern hemisphere is experiencing a second consecutive La Nina pattern, questions about the region's corn crop and export programs have been present in the global market for months. In the March WASDE, the WAOB estimates that Argentina and Brazil will produce record corn crops, 53.0 mmt and 114.0 mmt respectively. At 39.0 mmt Argentina's corn exports are expected to fall short of MY's 20/21 record 40.6 mmt. Brazil is estimated to export a record 43.0 mmt. We view these figures with reserved incredulity. In Argentina, the Rosario Grains Exchange is estimating corn production at 47.7 mmt, -5.3 mmt from WAOB and the Buenos Aires Grain Exchange is estimating 51.0 mmt, -2 mmt from USDA. In Brazil, CONAB is estimating a 122.8 mmt, -4.2 mmt from USDA. Because the local production estimates consistently point to smaller corn crops, we view the USDA's numbers as potentially overstated.

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Realigning 10-14 MMT of Global Corn Exports will Support U.S. Corn

Realigning 10-14 mmt of global corn exports capabilities is realistic and supportive for U.S. corn. We estimate that Argentine corn exports can decline to 36.0 mmt and Brazilian exports can fall to 38.0 mmt. The removal of an estimated 4 mmt of corn exports from Argentina and Brazil combined with 10 mmt of lost exports from Ukraine will shock global feed grain supplies. In the March WASDE, the WAOB's data shows expanding YoY and MoM global corn for feed use. Using increasing global corn demand when exports are falling can realign the global export regime and translate to increased U.S. exports, which should stimulate disappearance and support both cash and futures prices.

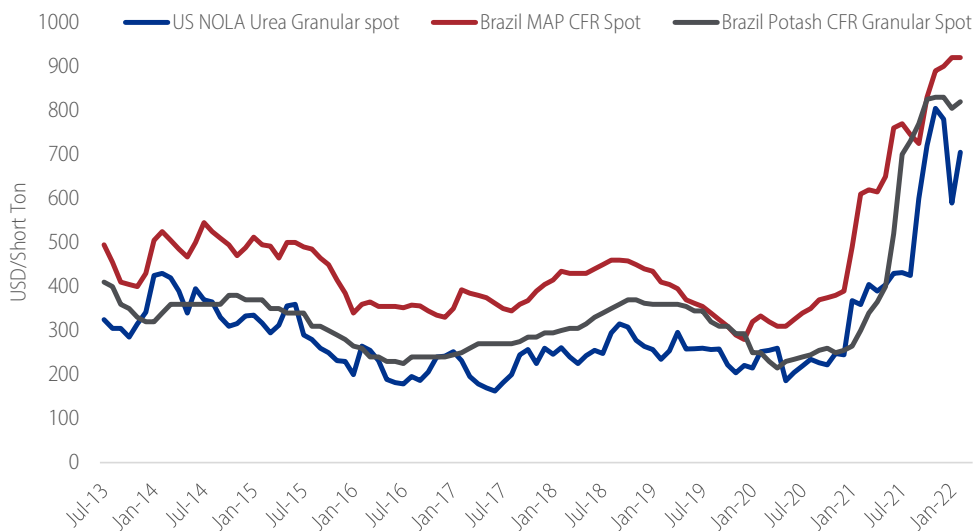
The combination of record high European natural gas prices in 2021, various trade complications and broad supply chain tightness have pushed global fertilizer prices to or close to record levels.

U.S. and Global Farm Inflation is at Record Levels

High NPK and diesel prices have pushed farm inflation to record levels. The combination of record high European natural gas prices in 2021, various trade complications and broad supply chain tightness have pushed global fertilizer prices to or close to record levels. FOB New Orleans (NOLA) prices for urea, DAP and potash have been trading at record levels. Because corn is a resource intensive crop, we believe that the rising cost structure will result in high farm gate prices and possibly lower yields. Referencing Iowa State's corn production model, NPK prices in central Iowa are +111%, +59% and +87% YoY. The estimated per bushel production cost for MY 22/23 is estimated at \$4.68, +23% YoY. We believe that the growing regions north and west of the Mississippi river and areas without river access will experience the largest NPK supply deficits, the highest cost of production and potentially the highest farmgate prices. These areas have the greatest risk for limited use and the greatest yield/production risks.

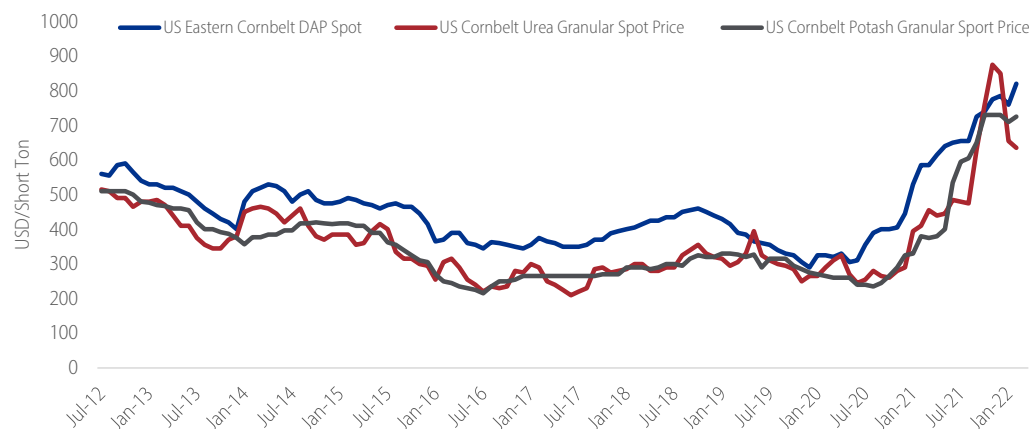
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International & Coastal Fertilizer Prices



Source: Bloomberg and HilltopSecurities

U.S. Inland Dealer Fertilizer Prices



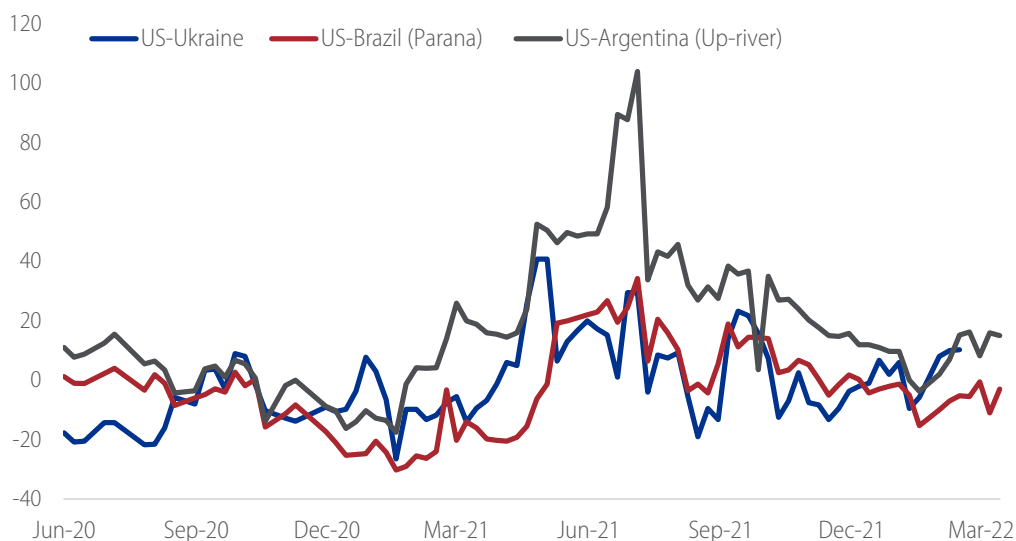
Source: Bloomberg and HilltopSecurities

U.S. is Best Poised to Capture the Bulk of the Realigning Corn Exports

Using the most current data, we identify emerging “green shoots” that support increasing U.S. corn exports. First, in the March WASDE report the WAOB acknowledged the increased uncertainty “of agricultural supply and demand conditions” in the Black Sea region. This resulted in MY 21/22 Ukraine exports declining by 6 mmt, U.S. corn exports rising by 1.9 mmt. Argentine and Brazilian export were unchanged. Second, the USDA’s net export corn sales have been rising since the invasion began. On March 10, the USDA reported weekly corn sales of 2.1 mmt. This was the largest sales volume of MY 21/22. 1.8 mmt was for MY 22/23 which makes us believe that global end users are concerned about the future. While two data points do not establish a trend, we believe that the global market is actively searching to secure feed inputs. Third, FOB spreads illustrate that U.S. corn exported from the Gulf is priced for business versus Prana, Brazil. Given the quality, quantity and reliability of U.S. corn we believe that the U.S. is properly positioned to service the world’s corn import needs.

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Global U.S. FOB Gulf Corn Spreads



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Source: Bloomberg and HilltopSecurities

Global Uncertainty is Supportive U.S. Corn But Challenges Remain

Uncertainty about global corn supplies and export flows can support U.S. corn demand and prices but challenges are present. A Russian/Ukrainian ceasefire, the potential for record planted U.S. corn acres, an outperforming Brazilian second corn crop, and increased supplies of corn substitutes like Indian and Australian wheat can create headwinds. We view the global market as possessing too many unknowns. While a ceasefire agreement could provide some price relief, we believe that the inherent fragility of such an agreement would still cause uncertainty. Despite the lofty price levels following the headlines, we reiterate our conviction in owning old crop U.S. corn, May '22, July '22 and new crop December '22. We also like owning old crop/new corn time spreads.

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