

ON POINT

ECONOMIC AND POLICY INSIGHT FROM THE OCC

Could Higher Prices Boost U.S. Grain Farm Income?

The conflict in Ukraine has notable impacts on the agricultural sector. As Russia, Ukraine, and Belarus are important global exporters of wheat, corn, barley, and agricultural fertilizers, anticipated supply disruptions of these commodities caused their prices to skyrocket. For U.S. farmers, this could translate into rising input costs and lower returns. However, less reliance on limited fertilizer imports and higher wheat and corn prices at the onset of the conflict are expected to increase U.S. grain farm revenue to a larger degree than higher fertilizer and fuel costs will increase grain farm expenses, thereby increasing total grain farm net income.¹

The Russia-Ukraine “Breadbasket” Region Holds an Important Role in Commodity Markets

Implications for Wheat, Corn, and Barley

Even though Russia’s and Ukraine’s economies account for less than 2 percent of global gross domestic product (GDP), these countries are large exporters of wheat, corn, and barley. On average between 2017 and 2021, Russia accounted for almost 20 percent of world wheat exports and 17 percent of barley exports, while Ukraine accounted for 15 percent of both corn and barley exports (figure 1). The development of the Russia-Ukraine conflict has largely disrupted agricultural exports from the region and threatens to constrict global supplies. As a result, prices for wheat, corn, and their by-products have already skyrocketed.

Often referred to as the “breadbasket of Europe,” the region’s wheat exports go mainly to the Middle East and Africa (MEA), which account for 90 percent of Russia’s exports and 60 percent of Ukraine’s exports. Wheat exports, however, are projected to drop not only because of Black Sea port closures but also because military action is expected to damage some stored grain, as well as Ukrainian infrastructure, making it more difficult to transport grain.² As a result of these supply disruptions, MEA countries may have to secure more of their wheat and grain supplies

¹ The commodity price growth assumptions used in this article’s analysis are explained in table 1 and the resulting effect on grain farmers’ revenue and net returns are in figure 3.

² Wheat planting season in Ukraine starts in September; so, for now the conflict is not disrupting planting.

from other exporters in the European Union (EU), the Americas, and Australia, especially as the conflict drags on.

Ukraine is also the fourth largest corn exporter in the world. Supply uncertainty from Ukraine, stemming from disruptions during the April planting season, together with weather-related production losses from South America, are causing global corn supplies to be the tightest and prices the highest in more than 10 years. China and the EU, as the primary buyers of Ukrainian corn, may need to increase their imports from the United States and South America if corn deliveries from Ukraine are delayed. While barley exports are also expected to fall, down 0.2 million tons to 5.8 million, the decline is likely to be much smaller than wheat and corn exports. Ukraine has already shipped 95 percent of its projected barley exports since July 2021—the beginning of this crop’s local marketing year in Ukraine—leaving only 0.3 million tons to be shipped later.³ Regardless, disruptions during the March barley planting season that could last until the July harvest, tight barley supplies and strong demand for animal feed are expected to maintain barley prices above \$7 a bushel this year, the highest price since 2015.

Implications for Fertilizers

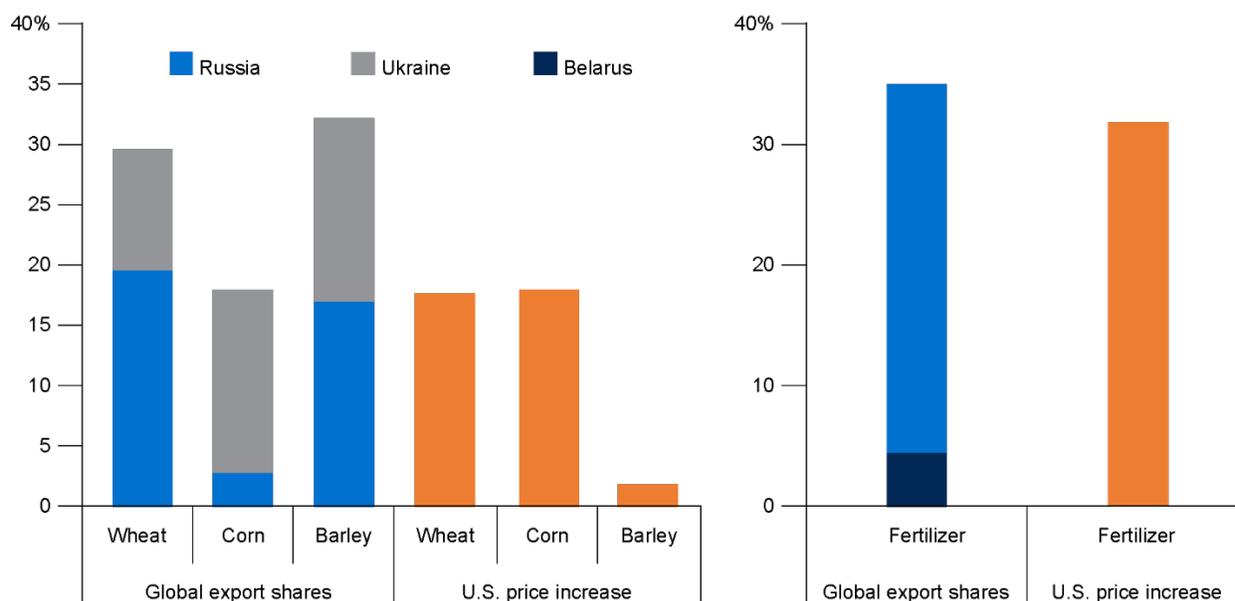
Russia is a primary producer of all three of the main commercial fertilizer inputs: phosphate, nitrogen, and potassium.⁴ It has developed a large fertilizer production sector, allowing it to be self-sufficient for fertilizers and an important global exporter, with nearly a 30 percent share of 2021 global exports. Although no current sanctions have specifically targeted fertilizers,⁵ Russian supply could be affected by other financial sanctions, including banking restrictions, that could make it extremely difficult for trade to take place. For example, payment transfers may be delayed because of sanctions, Russia could ask for payments in currencies other than U.S. dollars despite current agreements to use the dollar, or non-Russian counterparties may be concerned that their businesses could be targeted if they engaged with Russian producers. The resulting anticipated drop in Russian exports has already caused fertilizer prices to rise since January.

³ McConnell, Michael, Olga Liefert, Angelica Williams, Claire Hutchins, and Steven Ramsey, *Feed Outlook: April 2022*, U.S. Department of Agriculture (USDA) Economic Research Service, April 12, 2022.

⁴ Russia exports only nitrogen and potassium, not phosphate, to the United States.

⁵ Pickett, Allan, and Paul Hughes, “Russia-Ukraine: Impact of Escalating Tensions on Global Grains and Fertilizer Markets,” IHS Markit, February 2022.

Figure 1: Russia, Ukraine, and Belarus Global Export Shares and Price Growth by Commodity



Sources: USDA Foreign Agricultural Service (2021); USDA National Agricultural Statistics Service (2022).

Note: Wheat, corn, and barley are the average shares of global exports between 2017 and 2021. Price growth for wheat and corn is measured using growth between the average price in 2021 and the average price in March 2022. Price growth for barley is determined using the growth in the International Grains Council (IGC) barley price index between January 18 and March 8, 2022. Fertilizers are the share of global exports in 2019. Fertilizer price growth is for the period between January 2022 and March 2022.

United States Will Feel Impact Mostly Through Fertilizer Imports

Implications for U.S. Grain Farmers

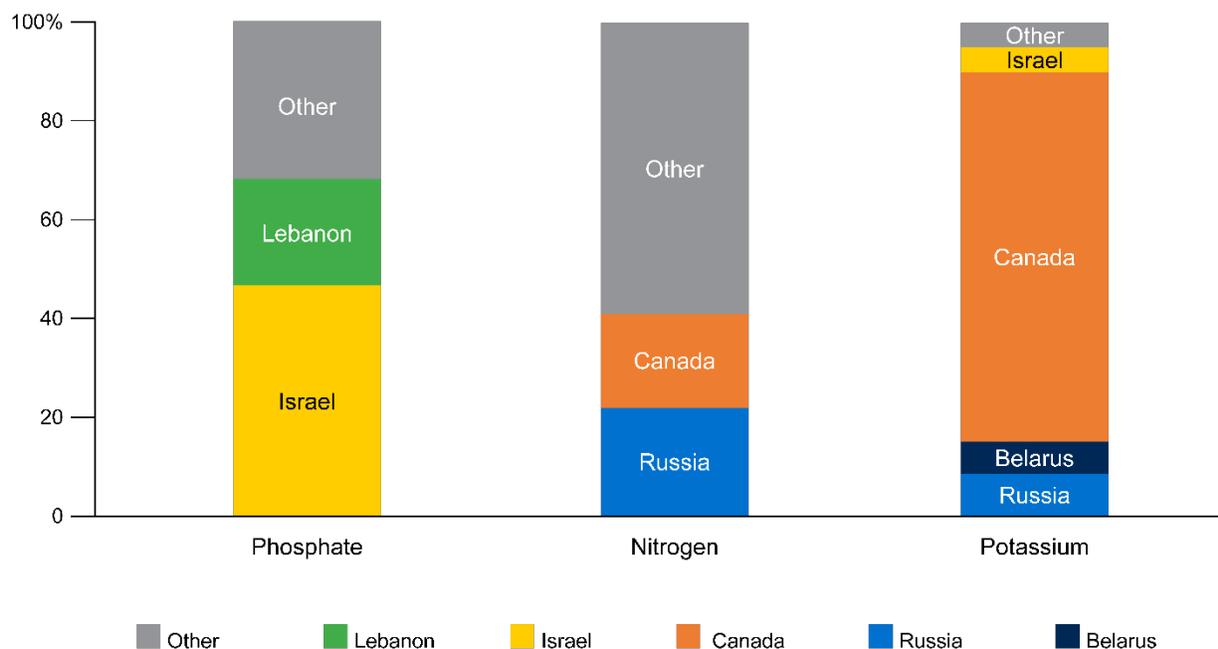
The United States buys a sizeable amount of fertilizer from Russia and Belarus (figure 1). As mentioned earlier, the conflict is expected to disrupt a significant portion of global supply. But most of those exports go to Europe, with Russia and Belarus accounting for about 15 percent of U.S. fertilizer imports, compared with Canada's U.S. import share of over 50 percent. Nonetheless, the United States' reliance on Russia is large enough to leave the agriculture sector vulnerable to higher fertilizer input prices, especially for nitrogen and potassium, since the United States imports 22 percent of nitrogen and 9 percent of potassium from Russia (figure 2).⁶

In fact, fertilizer prices have increased by 31 percent on average since the Ukraine conflict began. And this is on top of the near doubling of some fertilizer prices that occurred in 2021 from pandemic-related supply disruptions. Although farmers have adapted to higher prices by reducing consumption and shifting to lower cost alternatives, when possible, fertilizer cost was the leading driver of higher farm expenses last year. Wheat and corn farmers are especially susceptible to rising fertilizer prices as it constitutes more than a third of their operating costs, according to 2021 USDA estimates.

⁶ [UN Comtrade Database](#), import data for 2021.

Even though current high wheat, corn, and barley prices should increase farm revenue and promote their planting in the next planting season, some grain farmers worry that high grain prices will not be enough to offset the rising costs of production facing them as fertilizer and fuel prices soar.

Figure 2: Country Share of U.S. Imports of Fertilizer Inputs



Source: [UN Comtrade Database](#), import data for 2021.

Note: Shares are computed using volume data in metric tons for each commodity.

Implications for U.S. Consumers

Since the United States imports only a small volume of grains from the region, supply disruptions from the Ukraine conflict should have no impact on the availability of these commodities. Rather, the impact in the United States will be felt through higher prices. Consumers of wheat, corn, and their by-products are expected to face higher costs, adding to existing U.S. inflation pressures.

U.S. Grain Farmer Cost and Returns Scenario Analysis

In the end, the net impact of higher grain and fertilizer prices on U.S. grain farmers depends on whether the higher prices fetched on output are enough to offset the increased production expenses. The USDA publishes farm income statements that can be used to analyze the net effect on farm income. To start, baseline revenue and costs are created by using the USDA's 2021 cost and return forecast per acre for wheat, corn, and barley. However, price per bushel, gasoline prices, and fertilizer costs are adjusted using reported January 2022 prices, to reflect net returns before the conflict (see table 1). For the baseline, the fertilizer cost as a share of total costs is 13 percent for wheat, 17 percent for corn, and 9 percent for barley, making fertilizer the largest material cost that these farmers face.

The first hypothetical scenario estimates the immediate impact of the Ukraine conflict on net returns.⁷ The second hypothetical scenario estimates the impact on the full crop year.⁸ The assumed price increases under each scenario are shown in table 1.

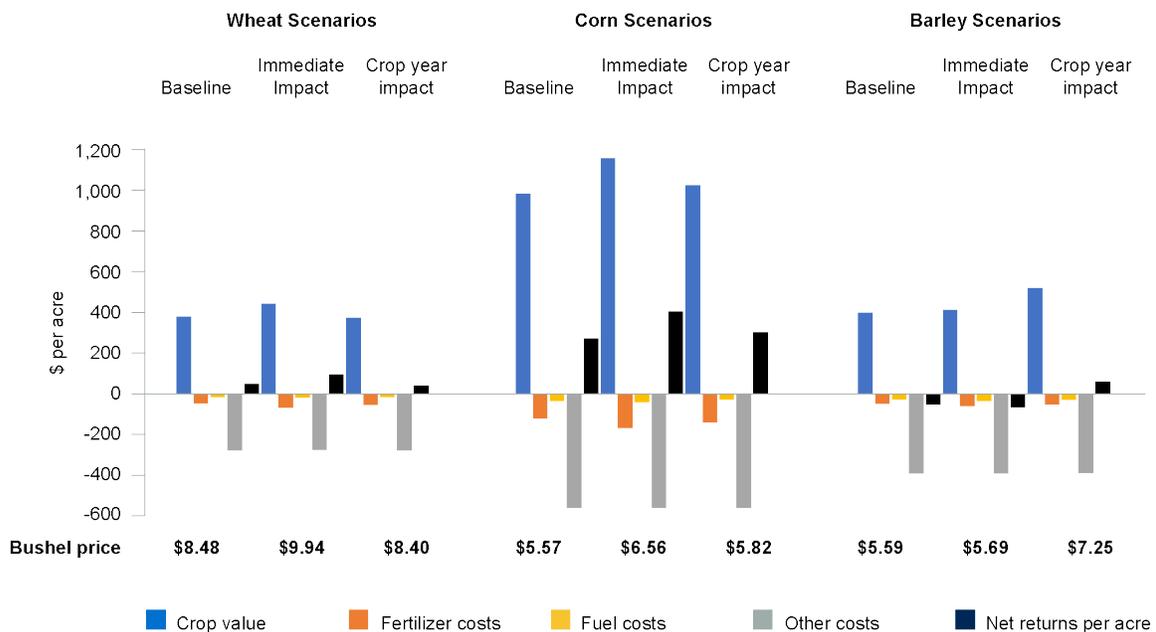
Table 1: Price Growth Assumptions From the Baseline, Percent

	Wheat	Corn	Barley	Fertilizer	Fuel
Scenario 1: Immediate impact	17	18	2	31	28
Scenario 2: Crop year impact	(1)	4	30	16	(2)

Source: OCC Economics & Policy Analysis calculations

For each of the three grains (wheat, corn, and barley), results comparing the scenarios to the baseline for crop value, costs, and net returns per acre are shown in figure 3.

Figure 3: Impact of Ukraine Conflict on U.S. Farmers' Net Returns



Sources: USDA Cost-Return Estimates, CME Group Inc., IGC.

Note: Fertilizer, fuel, and other costs are shown as negative balances.

⁷ The first scenario estimating the Ukraine conflict's immediate impact uses March 2022 prices received as published by the USDA for wheat, corn, and barley. For fertilizer, since monoammonium phosphate (MAP), diammonium phosphate (DAP) and urea are considered dry fertilizers, the average growth in dry fertilizer futures prices between late January and early March is applied to the January baseline fertilizer expense. For fuel, the growth in retail gasoline prices between January and March is applied to the January baseline fuel expense.

⁸ The second scenario estimating the Ukraine conflict's impact on the full crop year uses the September 2022 futures price as the harvest price for wheat and corn the USDA's average expected season price released in July 2022 as barley's harvest price. The growth between February 2022 and April 2022 for dry fertilizer prices is used to estimate fertilizer price growth because April is the peak cost month during the spring fertilizing season. Fuel cost growth is estimated as the price change from the March crude oil price and the average May through September 2022 realized and futures contract price because both planting and harvesting activities require fuel.

Compared with the baseline, the net returns per acre for wheat and corn are considerably higher in the immediate impact scenario, and in each case, returns are highest in the scenario with the highest grain price. Wheat and corn farmers should benefit from positive net returns through the crop year. However, net returns are expected to return closer to the baseline scenario later this year as prices settle lower than their March peak. In the case of barley, net returns are expected to turn positive in the crop year scenario as barley prices are expected to rise through September, far outpacing rising costs.

In the immediate impact scenario, the conflict jump-started prices for all three grains, leading to a large increase in net returns for wheat and corn. However, although rising prices were enough to outweigh rising costs in the case of wheat and corn, this was not the case for barley as net returns fell. Indeed, along with grain prices hitting multiyear highs, fuel costs also hit record levels in March, hurting barley farmers' bottom line.

Looking at the crop year scenario, wheat and corn prices fall along with net returns compared with the immediate impact scenario. As the market adjusts and the prospect of a grain corridor from Ukraine solidifies, wheat and corn prices are expected to soften and return to their baseline level. Therefore, under the crop year scenario, lower wheat and corn prices and higher fertilizer costs are expected to persist well into 2022. Net returns for wheat and corn in the crop year scenario are expected to worsen compared to the immediate impact scenario and return closer to their baseline scenario estimates. In the case of barley, increased demand and lower yields are expected to support barley prices through September, turning net returns positive in the crop year scenario.

Fuel costs for all three grains decrease between the baseline and the crop year hypothetical scenario, as futures prices point to crude oil prices falling from their March high this year.⁹ These results indicate that for wheat and corn farmers, the immediate impact of the increase in farm revenue from rising grain prices will swamp the increase in costs caused by higher fertilizer and fuel prices. But these gains will be short-lived as net returns fall closer to the baseline by September. In contrast, after initially falling, the net return for barley will surge, reflecting loss of supply from Russia and Ukraine, two important players in that market.

The Point?

Rising commodity prices at the onset of the Ukraine conflict are expected to increase net income for wheat and corn farmers despite higher fertilizer and fuel costs, in the near term.

⁹ CME Group Inc. futures quotes have crude oil futures prices falling to \$100 per barrel in September and remaining below \$100 per barrel for the rest of the year.