Food as the "Silent Weapon"

Russia’s Gains and Ukraine’s Losses

By Caitlin Welsh and Joseph Glauber

Introduction

Russia’s war in Ukraine has caused the greatest military-related disruption to global agricultural markets in at least a century. Ukraine’s agricultural sector has been a major front in Russia’s war since February 2022, and the primary purpose of Russia’s targeting of Ukraine’s agricultural infrastructure is likely to undercut a main source of Ukraine’s income. Ukraine’s GDP contracted by more than 29 percent in 2022 compared to 2021, and the value of agriculture as a proportion of Ukraine’s GDP was 39 percent lower in 2022 than 2021.

The global disruptions to the agricultural market due to Ukraine’s diminished production and exports have been stark: world food prices reached all-time nominal highs in March 2022, according to the UN Food and Agriculture Organization Food Price Index. In 2022, 258 million people suffered from acute food insecurity, an all-time high, according to the Global Report on Food Crises. At the same time, the cost of addressing these challenges also soared due to concurrent shocks in the global energy and fertilizer markets brought on by Russia’s war. For example, the cost of the delivery of humanitarian assistance also peaked due to the increased cost of food and fuel for operations. At the same time, for countries hoping to address domestic food insecurity with domestic agricultural production, the increased cost of fertilizer became a limiting factor. Likewise, countries dealing with the high price of food imports, high prices of agricultural inputs, and high levels of food insecurity also had less fiscal space for social programs following the Covid-19 pandemic, which drained national budgets.

If Ukraine’s depleted agricultural GDP has been a boon to Russia, the rising global food insecurity that has resulted from Russia’s war has also been beneficial: Ukraine’s diminished exports have created openings for Russia, another major global agricultural exporter, to make up for Ukraine’s losses, with Russia using its agricultural exports as a source of soft power. In early 2022, Dmitry Medvedev, the former Russian president and current deputy chairman of Russia’s Security Council, declared food to be Russia’s “silent weapon.” By August 2023, President Vladimir Putin declared Moscow’s intention to
“replace Ukrainian grain” with Russian grain, particularly to “needy countries.”

Since 2022, data show increases in Russia’s production and exports and decreases in Ukraine’s production and exports of key agricultural commodities. However, the specific regions to which Russia has exported more, and to which Ukraine has exported less, are unclear. Likewise, trends in Russia’s fertilizer exports have been difficult to discern. Using the best data available, this white paper assesses the change in Ukraine and Russia’s agricultural exports and trading partners for wheat and corn, as well as Russia’s fertilizer exports, since February 2022.

**The Impact of the War on Ukraine’s Crop Production**

The war has had direct and indirect impacts on agricultural production in Ukraine. The occupied regions of Donetsk, Luhansk, Kherson, and Zaporizhzhia accounted for about 21 percent of wheat, 17 percent of barley, and 19 percent of sunflower seed produced in Ukraine between 2016 and 2020, while very little corn is grown in the occupied areas. Analysis by NASA Harvest, NASA’s Global Food Security and Agriculture Consortium, estimates that the amount of abandoned cropland in Ukraine in 2023 due to the war is equivalent to about 7.5 percent of total cropland in the country. In addition, the war has increased the costs of transporting grain and other agricultural products to export markets. Most of these costs have been absorbed by Ukrainian producers in the form of lower prices, which has reduced profitability of crops such as wheat and corn. As a result, Ukraine has planted and harvested fewer crops. The U.S. Department of Agriculture (USDA) estimates that harvested area for wheat, corn (maize), and barley for 2023 is down 32 percent, 27 percent, and 37 percent, respectively, from 2021.

**Figure 1: Ukraine Harvested Area**

(million hectares)

levels. Sunflower area is also down 15 percent, while the combined area for soybeans and rapeseed has actually increased 21 percent. However, net area for the six crops is down 19.5 percent over the past two years. For 2024, Ukrainian producers are expected to cut corn-planted areas further but continue to increase areas with oilseeds, especially soybeans, according to survey results from a recent survey from the Ministry of Agrarian Policy and Food of Ukraine.

Figure 2: Ukraine Grain Exports, January 2022–November 2023 (mmt)

Note: This data was downloaded from the TDM database using the following tariff lines: HS 1001 (wheat), HS 1003 (barley) and HS 1005 (corn).

**Impacts on Ukrainian Exports**

The impact of the war on Ukrainian exports was immediate (see Figure 2). Shipping out of Ukraine’s ports on the Black Sea came to a halt in the week leading up to the invasion as shipping lanes were mined and Russian ships patrolled sea lanes. By the time of the invasion on February 24, Ukraine had shipped most of its wheat and barley harvested in the previous summer, but about 40 to 45 percent of its corn remained to be shipped. With shipping out of the Black Sea halted, exports were transported over land and by river on rail, truck, and barge through Poland, Hungary, Slovakia, and Romania to destinations in Europe and to the Romanian port of Constanta. These so-called solidarity lanes exported about one-third of the level that would typically be shipped through the Black Sea ports during that period. As crops planted in the fall began to be harvested in the spring, Ukrainian producers began to face storage constraints which, combined with higher transportation costs, drove down local grain and oilseed prices. Sunflower seed crushers, many located near Black Sea port facilities, found it more profitable to export the oilseed rather than the oil and meal components.

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1 USDA production estimates for Ukraine exclude statistical data concerning the Donetsk, Luhansk, Kherson, and Zaporizhzhia regions.
The UN-brokered Black Sea Grain Initiative (BSGI) went into effect in late July 2022, and Ukrainian grain and oilseed exports resumed shipping out of three ports around Odesa. Export volumes more than doubled, which eased storage constraints at a critical juncture when the fall harvest began. By February 2022, grain export levels were approaching prewar totals. Russia temporarily suspended the agreement in November 2022 and then repeatedly threatened to pull out in 2023 before finally terminating the agreement in July 2023. Nonetheless, over the 12 months during which the BSGI was in effect, Ukraine shipped nearly 33 million metric tons (mmt) of grains and other agricultural products from its Black Sea ports, which helped contribute to a decline in international prices of staple foods and helped sustain global food supplies.

Termination of the BSGI resulted in a sharp decrease in exports in the late summer and early fall of 2023 as exporters sought alternative routes. Ukraine’s military successes in the Black Sea resulted in a retreat of the Russian naval fleet from the western Black Sea, which helped enable the re-establishment of a “humanitarian corridor” that allows shipping of agricultural products from Black Sea ports. Export volumes by the late fall of 2023 had rebounded significantly.

**How the War Has Affected Trade Flows**

Disruption to shipping in the Black Sea has resulted in more Ukrainian exports going to Europe and less going to regions such as Sub-Saharan Africa and Asia. Between January 2021 and February 2022, less than 2 percent of total Ukrainian wheat exports went to European markets, but since February 2022, European markets have received 50 percent of total wheat exports (see Figure 3). While countries in the Middle East and North Africa (MENA, also including Turkey) remain large markets for Ukraine, the share of exports has dropped from 53 percent to 34 percent over these same periods. The largest impact to wheat exports has been felt by Sub-Saharan Africa, which fell from 10 percent to 3 percent, and South and Southeast Asia, which fell from 30 percent to 12 percent.

**Figure 3: Ukraine Wheat Exports by Region, January 2021–November 2023 (mmt)**

Note: This data was downloaded from the TDM database using the following tariff line: HS 1001 (wheat). MENA includes Turkey.

Source: “Trade Data Monitor: Homepage,” tradedatamonitor.com
Europe also saw a large increase in corn imports from Ukraine after February 2022 (see Figure 4). Over 64 percent of total corn exports from Ukraine went to European markets after the start of the war, compared to 36 percent in the 14-month period prior to the invasion. Corn exports to Middle East and North African countries (including Turkey) dropped from almost 25 percent of total exports to 17 percent. Ukraine corn exports to East Asia (primarily China) have also fallen since the war. Corn exports to East Asia accounted for over 34 percent of total corn exports before the invasion, but that share fell to less than 19 percent after February 2022.

Figure 4: Ukraine Corn (Maize) Exports by Region, January 2021–November 2023 (mmt)

![Figure 4: Ukraine Corn (Maize) Exports by Region, January 2021–November 2023 (mmt)](image)

Note: This data was downloaded from the TDM database using the following tariff line: HS 1005 (corn). MENA includes Turkey.
Source: “Trade Data Monitor: Homepage,” tradedatamonitor.com

**Impacts of the War on Russian Exports of Wheat and Fertilizers**

Russia is the world’s largest exporter of wheat and accounts for a large share of global exports of fertilizer components such as potash, urea, diammonium phosphate (DAP), and anhydrous ammonia. Market prices for these commodities spiked after the invasion in February 2022, in part because of the fear that Russian exports, as well as Ukraine’s, would be adversely affected. The sanctions imposed by the European Union, United States, Canada, and other countries on Russia and Belarus following Russia’s 2022 invasion included restrictions on banking, trade, technology transfers, and specific individuals. (These came on top of earlier sanctions on both countries—on Russia in response to its 2014 annexation of Crimea and on Belarus in response to human rights violations in 2020 and its forced **grounding** of Ryanair Flight 4798 to seize a dissident journalist in 2021.) But these sanctions exempted the agricultural sector, including inputs such as fertilizers, to avoid side effects on global food security.

Russian wheat production over the past two marketing seasons has been at a record high due to record plantings and yields (see Figure 5). The USDA **estimates** that Russian wheat exports will likely be a record-high 51 mmt for the 2023-2024 marketing year.
Analyzing the impact of the war on Russian exports is complicated by the fact that Russia discontinued reporting exports (and imports) to the United Nations in early 2022. To estimate the impacts on trade, one must resort to so-called mirror trade methodologies (aggregating data from importing countries who report imports from Russia) or by examining maritime shipment data that is collected by private sources. Neither is ideal, but shipment data for wheat is superior to mirror trade data, as the latter only captures a small share of total exports due to missing key data from regions where import reporting lags, such as Sub-Saharan Africa. (For example, for the July 2020–June 2021 marketing year, Russia reported wheat exports at 38.1 mmt, while mirror trade data over the same period showed only 14.0 mmt.) This paper uses shipment data collected by KPLR and processed by the International Grains Council (IGC) and World Trade Organization (WTO) and published by the WTO’s Global Trade Data Portal.

Cumulative shipment data collected over the period July 1, 2023, to January 31, 2024, allows a comparison of exports during the current 2023/24 marketing year to last year’s exports over the same seven-month period and to a three-year average level taken over the 2020–2021, 2021–2022, and 2022–2023 periods (see Figure 6). Russian wheat exports dipped in the first few months after the invasion began but recovered by mid-summer that year. Total wheat shipments over the period July 1, 2023, to January 31, 2024, totaled 22.1 mmt, compared to 21.9 million tons for the same period last year and an average 20.4 mmt over the three-year average).

Figure 6 shows that more wheat shipments during the 2022-2023 marketing year went to North Africa and Western Asia and proportionately less wheat went to Sub-Saharan Africa and Southern and Southeastern Asian markets than in prior years. But for the first seven months of the 2023/24 marketing years, Russia’s wheat trade has largely reverted to more traditional pattern, with more wheat going to Sub-Saharan Africa.
Figure 6: Russia Cumulative Wheat Exports through January 31, 2023–2024 Marketing Year Compared to Previous Periods (mmt)

Note: Data reflects cumulative wheat exports over the period July 1 to January 31 and is based on cargo tracking data collected by Kpler and processed by IGC and WTO.

The impact of the war on Russia’s fertilizer exports has been mixed (see Table 1). Based on mirror trade data, potash exports were down in 2022 compared to 2020 and 2021 levels but have rebounded strongly in 2023. Urea and DAP exports both were up in 2022 and for the first 11 months of 2023. By contrast, exports of anhydrous ammonia fell by more than 70 percent in 2022 and have declined further in 2023. This largely reflects the impacts of the closure of the Tolyatti-Pivdennyi ammonia pipeline and Russia’s difficulties in moving exports to more remote ports on the Baltic Sea. Unlike for wheat, where key import data is lacking, mirror trade data for fertilizer typically captures 80–90 percent of exports based on data for 2020 and 2021.

### Table 1: Global Fertilizer Imports from Russia (Metric tons)

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023 (Jan–Nov)</th>
<th>2022 (Jan–Nov)</th>
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<tbody>
<tr>
<td>Potash</td>
<td>9,301,023</td>
<td>9,468,801</td>
<td>7,499,987</td>
<td>10,076,778</td>
<td>6,954,780</td>
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<tr>
<td>Urea</td>
<td>2,794,203</td>
<td>3,029,522</td>
<td>3,111,741</td>
<td>3,239,030</td>
<td>2,794,083</td>
</tr>
<tr>
<td>Diammonium phosphate</td>
<td>1,362,120</td>
<td>1,156,001</td>
<td>1,266,209</td>
<td>1,314,015</td>
<td>1,183,131</td>
</tr>
<tr>
<td>Anhydrous ammonia</td>
<td>3,271,906</td>
<td>3,254,462</td>
<td>955,939</td>
<td>356,020</td>
<td>864,015</td>
</tr>
</tbody>
</table>

Note: This data was downloaded from the TDM database using the following tariff lines: HS 310400 (potash), HS 310210 (urea), HS 310530 (diammonium phosphate), and HS 281400 (anhydrous ammonia). This reflects data from reporting importers only.


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**Analysis**

The data presented here offer insights regarding the impact of Russia’s war on agricultural production, exports, and market shares for both Ukraine and Russia.

Ukraine’s wheat and corn exports have fallen relative to prewar exports for every region except Europe. Wheat exports to Europe grew from 2 percent in the period preceding Russia’s invasion to 50 percent post-invasion, and corn exports to Europe grew from 36 percent pre-invasion to 64 percent. These figures mask the ultimate destinations of much of Ukraine’s wheat and corn, as some European countries further export Ukrainian grains to countries outside of the region. Nonetheless, the sudden increase in Ukrainian exports to its European neighbors resulted in market disruptions in many of these countries, particularly the “frontline five”—Poland, Romania, Hungary, Slovakia, and Bulgaria. Trade disputes have erupted between Ukraine and these countries, and disagreements have emerged within the European Union regarding ways to maintain support for Ukraine’s agriculture sector while not overburdening its neighbors’ agricultural markets or diminishing their farmers’ incomes. Agricultural market disruptions have influenced national elections in some countries, and tensions with Ukraine and within the European Union are ongoing.
While Ukraine’s exports to Europe spiked and exports to all other regions fell, one country noticeably affected is China. Prior to Russia’s invasion, East Asia (primarily China) accounted for 34 percent of Ukraine’s corn exports, but it has accounted for less than 19 percent since February 2022. While the BSGI was operational, China was the major beneficiary of Ukraine’s exports, importing nearly 8 million of the almost 33 mmt of grains and other agricultural products exported under the BSGI between July 2022 and July 2023. Almost 73 percent of China’s imports (by volume) from Ukraine under the BSGI was corn, with Ukraine providing 27 percent of China’s corn imports during this period. China’s reliance on Ukraine as a relatively inexpensive source of corn, a major form of animal feed, kept these countries close for much of the period since Russia invaded Ukraine, perhaps tempering Russia’s influence on China during this period. Since the cessation of the BSGI, however, China has turned from Ukraine to South America, mainly Brazil, as a source of corn.

From the prewar period to today, Ukraine’s wheat exports to Sub-Saharan Africa fell from 10 percent of Ukraine’s total to 3 percent, and Ukraine’s wheat exports to North Africa fell from 53 percent to 34 percent. Whether Russia has successfully “replaced” Ukraine as a source of wheat to the African continent is not possible to determine with available data, but certain patterns are clear. Between the 2022-2023 and 2023-2024 marketing year, Russia’s exports of wheat increased to each WTO region of Sub-Saharan Africa (Eastern Africa, Central Africa, Western Africa, and Southern Africa). In this period, Russia has tried to assuage opposition from African countries who disapproved of Russia’s termination of the BSGI on the grounds that it would increase the cost of food imports. Speaking at a Russia-Africa summit in St. Petersburg on July 27, 2023, President Putin said that Russia was ready to replace Ukrainian grain exports to Africa and offered to provide Burkina Faso, Zimbabwe, Mali, Somalia, the Central African Republic, and Eritrea with 25,000-50,000 metric tons of free grain each in the next three to four months. Russian state news reported on February 21, 2024 that Russia’s agriculture ministry had completed delivery of grains to these countries, including 25,000 metric tons of wheat each to Burkina Faso, Eritrea, Mali, and Zimbabwe, and 50,000 metric tons of wheat to Somalia and the Central African Republic. In September 2023, Russia announced an agreement with Turkey and Qatar to move 1 mmt of Russian grains to the “neediest countries” in Africa. Increased exports to Sub-Saharan Africa reflect efforts by Russia to bolster support in the region and deflate criticism over termination of the BSGI.

Russia’s wheat exports to North Africa for the first seven months of 2023-2024 are down from the same period a year ago, but their market share has remained roughly the same at 47 percent, and North Africa remains the top destination of Russian wheat. Russian wheat exports to Western Asia over the first seven months of 2023-2024 have similarly declined, but Russia’s market share has actually increased from 51 percent to 59 percent.

The BSGI had promised to secure Russia’s exports of anhydrous ammonia through the Tolyatti-Pivdennyi pipeline, which terminates near Odesa. Ukraine has obstructed the flow of ammonia through the pipeline since February 2022. In early June 2023, Russia and Ukraine reported damage to the pipeline. As a result, BSGI-facilitated inspections of ships into and out of Pivdennyi ground to a halt in June 2023. Some analysts suggested that repairs to the pipeline, and eventual resumption of exports of Russia’s anhydrous ammonia, would be necessary to renew the BSGI in July 2023. Instead, Russia terminated the deal that month.

Regarding fertilizer, Russia’s exports of potash, urea, and diammonium phosphate have rebounded,
though exports of anhydrous ammonia have stalled. Sales of all fertilizer types were lower during the first 10 months of 2022 than in November and December of that year. Nonetheless, because Russia’s war disrupted fertilizer markets, causing fertilizer prices to climb, Russia’s revenues from fertilizer sales in the first 10 months of 2022 were **70 percent higher** than the same period in 2021. One of Russia’s explanations for terminating the BSGI was that its own agriculture sector has suffered during the war and particularly since the BSGI was implemented. Record-high levels of wheat exports and rebounding sales of fertilizers (except anhydrous ammonia) indicate Russia’s bluff, underscoring the real reasons Russia has been targeting Ukraine’s agriculture sector: to gain wartime economic and political advantage.

**Conclusion**

Agriculture and food security are central to Russia’s war strategy. Ukraine’s agricultural sector has been a major target of Russia’s attacks since February 2022. Ukraine’s agricultural production, exports, and GDP have declined as a direct result. Russia’s war in Ukraine has also led to historic disruptions to global agriculture, energy, and fertilizer markets, with food insecurity increasing among millions as a result. Russia has exploited food insecurity in low- and lower-middle-income countries for its benefit in two ways: (1) by aiming to decrease (or even eliminate) Ukraine as a source of food for these countries, thereby decreasing Ukraine’s potential influence in these places, and (2) by increasing these countries’ reliance on Russia as a source of food, thereby increasing Russia’s influence.

Since February 2022, it is apparent that Russia’s production and exports of food has increased, and that Ukraine’s has decreased. The data presented here sheds light regarding the specific regions to which Russia’s exports have increased and the regions to which Ukraine has exported less because of Russia’s war. Time and innovations in trade data will further clarify the patterns explained here. Without a significant change in the course of the war, however, one can expect Russia to continue to use food and fertilizer as potent soft power tools, and to continue to capitalize on the destruction of Ukraine’s agriculture sector and the damage done to global food security as a result.

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