



The Second Harvest Under Missiles: Update on the Situation in Ukraine

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October 11, 2023

farmdoc daily (13): 186

Recommended citation format: Tetteh, I, J. Colussi, and N. Paulson. "The Second Harvest Under Missiles: Update on the Situation in Ukraine." *farmdoc daily* (13): 186, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, October 11, 2023.

Permalink: <https://farmdocdaily.illinois.edu/2023/10/the-second-harvest-under-missiles-update-on-the-situation-in-ukraine.html>

Since February 2022, Russia's war in Ukraine has caused significant damages to the country's people, economy, and resource base. Russia has been targeting Ukraine's agricultural sector, weakening one of its vital economic industries. Currently, Ukraine is the most heavily mined country in the world with almost a third of its territory being heavily contaminated with landmines, including 1.2 million acres of farmland (Hegglin, 2023). This article examines the impact of the war on Ukraine's economy and people and Ukraine's corn and wheat production and exports since the beginning of the conflict 19 months ago. The next article in this two-article set will explore the new export routes for Ukrainian grain since the Black Sea Grain Initiative expired following Russia's exit in July 2023.

The Impact of the War on Ukraine's Economy and People

Based on the most recent estimates, Ukraine's military casualties have risen to 70,000 soldiers killed and over 100,000 injured (Cooper, 2023). The war is taking a significant toll on civilians as well: over 9,000 civilian deaths and 15,000 injuries are confirmed in the first 17 months of the war (the United Nations, 2023). About 6 million Ukrainians have fled the country seeking refuge from the war. Even though the return prospects look promising (about 63% of refugees plan to return to Ukraine), the permanent loss of the population due to the non-return from abroad has been estimated to result in a more than four percent decline of Gross Domestic Product (GDP) annually (Vyshlinsky et al, 2023).

The war has negatively impacted the overall economy as shown by a 30% decline in GDP in 2022. Total war damages to Ukraine's agricultural sector amount to \$40.2 billion including direct damages to machinery and equipment and indirect losses associated with lower production, logistics disruptions, and other factors (Kyiv School of Economics, 2023). Demining of the agricultural land alone will cost Ukraine

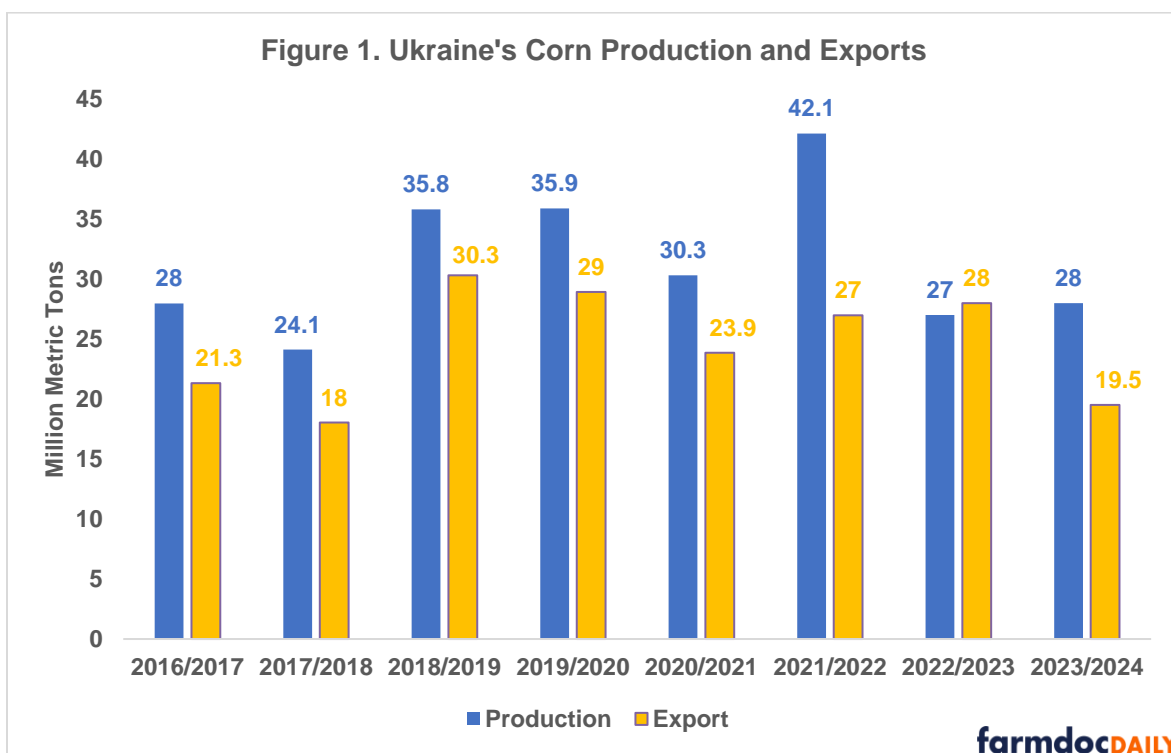
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about \$1.5 billion (World Bank, 2023). However, as the Ukrainian people and businesses have started to adapt to the ongoing war, the economy grew three percent in the first quarter of 2023 and is projected to stay on this growth trajectory through the end of the year.

Ukraine’s Corn and Wheat Production and Exports

Ukraine is one of the main world exporters of grains as well as vegetable oils. The main agriculture export products are corn and wheat. In 2021, before the war, Ukraine was the second largest supplier of grains for the European Union and a large food supplier for low and middle-income countries in Asia and Africa. The war’s negative impacts on Ukraine’s agricultural production and exports in the last two years can be seen in Figures 1 and 2 and in Table 1.

In 2021, Ukraine had record wheat and corn yields resulting in 30-40% percent higher total production compared to 2020 levels (see Figures 1 and 2). While the 2021 harvest itself was unaffected by the war, exports of that year’s harvested grain were severely impacted in the second half of the 2021/2022 marketing year (February – July). Once Russia invaded Ukraine, export routes were disturbed due to the blockade of the Black Sea ports¹ which Ukraine used to export 90% of its grain prior to the war.



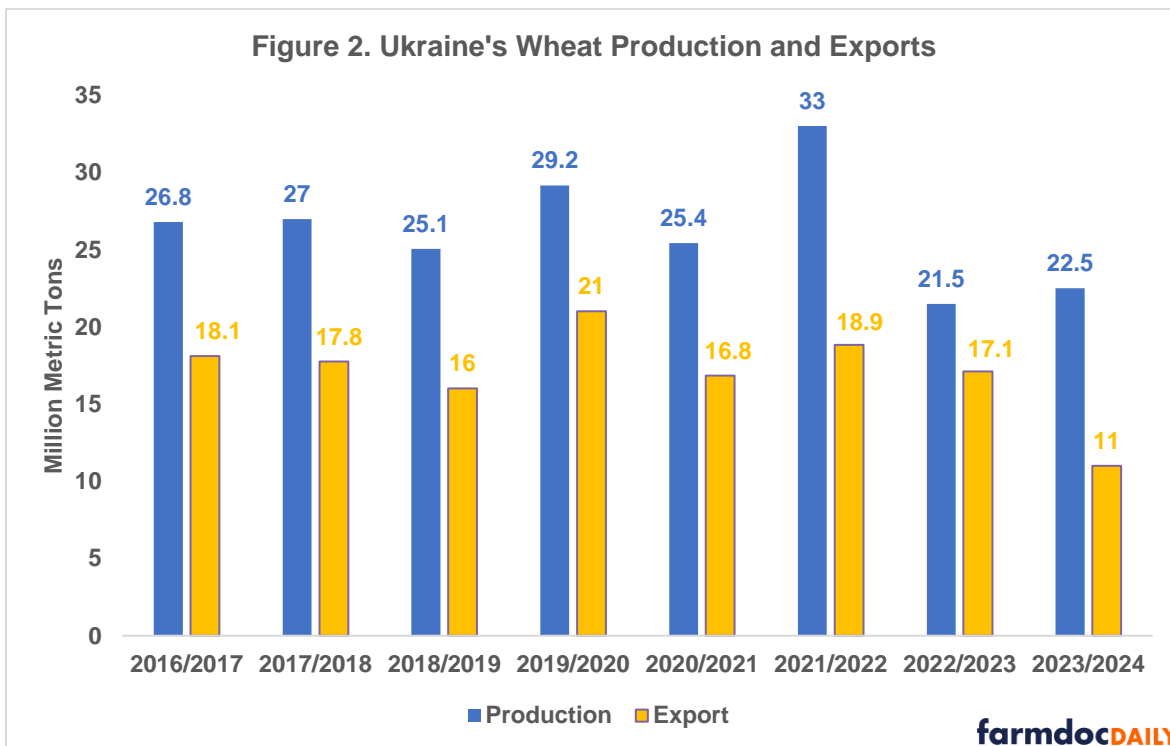
Source: USDA WASDE Report, September 12, 2023
 Note: values for 2023/2024 marketing year are projected values.

The new more expensive and slower export routes (by railway and truck) slowed down Ukraine’s grain exports in the second half of the 2021/2022 marketing year (see *farmdoc daily*, February 24, 2023). Slower exports coupled with record high production that year resulted in significantly higher ending stocks of wheat and corn than usual (5.27 million metric tons of wheat and 7.59 million metric tons of corn compared to the pre-war levels of 1.5 million metric tons). Even though the overall export levels were

¹ The Black Sea ports were blockaded from February 2022 until July 2022 when the Black Sea Grain Initiative was put in place giving Ukraine 12 months of access to the Black Sea grain exports routes until July 2023 when Russia pulled out of the deal and resumed the blockade.

comparable in magnitude to pre-war levels, Ukraine was not able to export the extra grain harvested during that year.

In 2022, due to a 28% decline in planted area (11.1 million acres) compared to the pre-war levels and a 12-16% decline in yields of corn and wheat, Ukraine's production dropped to 27 million tons of corn and 21.5 million tons of wheat – a 34-35% decline compared to 2021 levels (USDA FAS, 2023; USDA WASDE, 2023). However, given that the 2021 production year was an outlier characterized with extremely high yields, an accurate comparison of the changes in production and exports before and after the invasion must be done with the average levels over multiple years prior to the beginning of the war (see Table 1).





Source: USDA WASDE Report, September 12, 2023
 Note: values for 2023/2024 marketing year are projected values.

The Black Sea Grain Initiative (BSGI) was an agreement between Ukraine, Russia, Turkey, and the United Nations to remove the blockade of the Black Sea and resume maritime grain shipments from the Ukrainian Black Sea ports. Ukraine exported 40% of its 58 million metric tons of total grain exports in 2022/2023 through the BSGI. The agreement was put in place in July 2022. A year later, Russia pulled out of the agreement and announced that it would treat all vessels as military targets in the Black Sea region further deteriorating grain export routes for Ukrainian farmers.

Table 1 shows the percentage change in production and exports for corn and wheat in the last three years compared to the five-year average capturing the 2017-2021 production years. Ukraine's corn and wheat production in 2022 declined by 20–23% compared to pre-war levels. Despite very pessimistic projections after the invasion, Ukrainian grain exports have turned out much stronger than expected.

Large beginning stocks and the availability of new and more efficient grain export routes established through the Black Sea Grain Initiative (BSGI) in July 2022 (compared to the export routes available in the second half of the 2021/2022 marketing year) allowed Ukraine to export 17 million metric tons of wheat and 28 million metric tons of corn in the 2022/2023 marketing year, a 5% decline in exports of wheat but a 9% increase in exports of corn compared to pre-war levels (USDA WASDE, Sep 2023).

Table 1. Changes in Grain Production and Exports in Ukraine: Prior to and Post-Invasion Levels

	Corn 		Wheat 	
	Production compared to 5-yr average	Exports compared to 5-yr average	Production compared to 5-yr average	Exports compared to 5-yr average
2021/2022	25%	5%	18%	4%
2022/2023	-20%	9%	-23%	-5%
2023/2024F	-17%	-24%	-19%	-39%

Source: author calculations using USDA WASDE report from Sept. 2023.

As the country has adapted to the new realities of living under the war and the availability of more sustainable export routes through the BSGI in spring of 2023, Ukrainian farmers did not cut planted acres as severely as anticipated for 2023. Even though area planted was reduced by another 3.7 million acres, excellent yields due to favorable weather conditions are projected to result in 28 million metric tons of corn and 22.5 million metric tons of wheat, placing this year’s production at 17-19% below the pre-war levels.

Based on the last World Agricultural Supply and Demand Estimates (WASDE-USDA) report (Sep 2023), Ukraine’s exports of corn and wheat in the 2023/2024 marketing year are projected to decline 24% and 39%, respectively, compared with pre-war levels. Such a significant downgrade in export projections is explained by the loss of export routes since July of 2023 when Russia pulled out of the BSGI. A follow-up article will examine the new export routes for Ukrainian grain and the possible scenarios for the future of production and exports from Ukraine.

Summary

The war has negatively impacted the overall economy in Ukraine since the beginning of the conflict in February 2022. Ukraine’s corn and wheat production in 2022 declined by 20–23% compared to pre-war levels. Despite very pessimistic projections for grain exports for Ukraine after the invasion, exports have been much stronger than expected. The resilience in Ukrainian grain exports has been achieved through close collaboration between farmers, transportation networks, governments, and foreign allies, but significant challenges remain.

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