Impacts of 2022 Russian Military Invasion on Food Supplies from Ukraine

Oleg Nivievskyi[a], Pavlo Martyshev[b], Roman Neyter[b], Mariia Bogonos[c], and Dmytro Dushko[d]

[a] Assistant Professor & Dean, Department of Graduate Economics Studies at Kyiv School of Economics/ Guest Researcher at the University of Goettingen

[b] Researcher at the Center for Food and Land Use Research at Kyiv School of Economics (KSE Agrocenter)

[c] Head of the Center for Food and Land Use Research at Kyiv School of Economics (KSE Agrocenter)

[b] Junior Researcher at the Center for Food and Land Use Research at Kyiv School of Economics (KSE Agrocenter)

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Abstract

The unfolding Russia's invasion of Ukraine is expected to have a far-reaching crack-down effect on global food security and Ukraine's economic growth. Over the last 30 years Ukraine has emerged into an increasingly important global supplier of grains and vegetable oil, with a capacity to continue closing its productivity gap and delivering even more food to the global market. This trend has been terminated by an unprovoked Russia's full-scale military invasion of Ukraine in February 2022. The price of the continued war is already immense for Ukraine, including for its agriculture. Total estimated agricultural war damages and losses for Ukraine reached already US$ 40.9 billion, almost a quarter of the sector has been destroyed and destructions are only mounting; farmers experience a glaring shortage of liquidity and capital for current harvesting and planting works; this year harvest projections are 30-50% lower than the last one and further agricultural outlook look even worse. In the current tight global market conditions and outlook, the capacity to replace the expected missing exports from Ukraine in the world are very limited. In other worlds but by no means exaggerated, every ton of grains from Ukraine will count this and next season!

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1. Introduction

Since the breakup of the Soviet Union, Ukraine has emerged into an important global supplier of grains and vegetable oil. It more than doubled its production of grains and oilseeds and increased its exportable supplies by more than 40 times, reaching 10% of the world wheat, 15% of corn and barley, and 50% of sunflower oil in global exports (Glauber and Laborde, 2022). Abundance of black soils (27.8 mil hectares or almost one-third of the total world stock), favorable climate conditions, landscape characteristics that

allow for larger fields and large-scale farming, suitable geographical location and access to the Black Sea, on-farm and post-farm investments, have been very instrumental for a substantial productivity increase. Nevertheless, Ukraine's agriculture was still performing below its potential and potentially could reach the yields as in the EU and in the US and could make even much larger contribution to economy of Ukraine and to global food security (Nivievskyi et al, 2022).

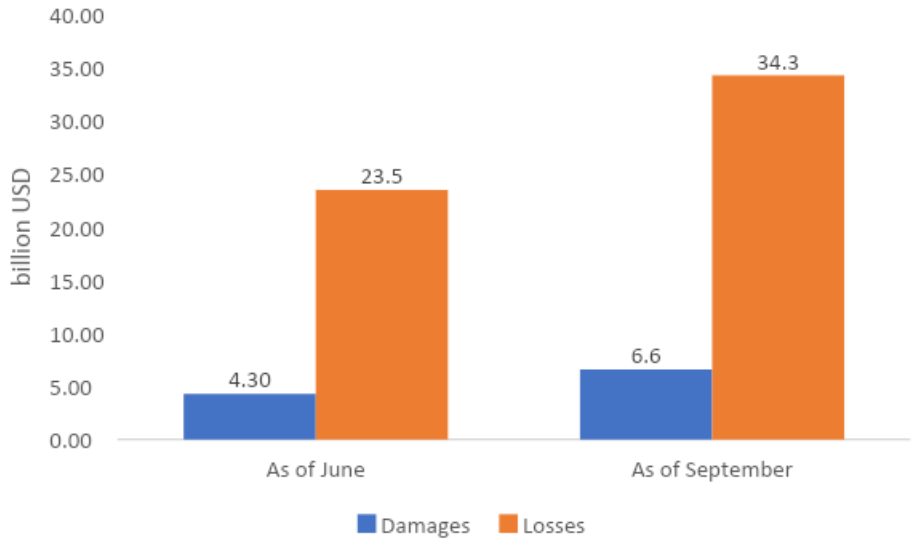
Ukraine's agricultural growth, however, has been terminated by Russia's full-scale military invasion of Ukraine on February 24th, 2022, with the expected immense consequences not only for Ukraine, but also for security in Europe, for energy markets and for global food security (von Cramon-Taubadel, 2022). The price of the full-scale war is already immense for Ukraine and it continues to increase every day and spills over to every corner of the globe by means of food and energy inflation and shortages. The most recent estimate of total damages to Ukraine has reached already USD 136 billion or almost 64% of its 2021 GDP (KSE, 2022) and this figure does not include recent massive missiles attacks of critical infrastructure in October-December. More than 14 mln of Ukrainians left their homes, including 7.9 mln refugees recorded across Europe (UNHCR, 2022). Agricultural damages and losses also continue to mount every day in Ukraine, surging the uncertainty and agricultural outlook, driving Ukrainian farmers nearly to bankruptcy, and depressing substantially this and next season's agricultural output, therefore increasing concerns about global food security. This article provides an assessment of the scale of the impact of the Russian war on Ukraine's agriculture and its implication on food supplies from Ukraine.

2. War damages and losses are piling up quickly for Ukraine's agriculture

Total estimated agricultural war damages and losses[1] for Ukraine reached already US$ 40.9 billion in September 2022 (KSE Agrocenter, 2022), including US$ 6.6 billion of damages and US$ 34.3 billion of losses. Figure 1 demonstrates that the damages and losses have been piling up quite quickly, i.e. September estimates are roughly 50% higher than June estimates.

[1] Valuation and measurement was done using the Post Disaster Need Assessment methodology (GFDRR et al, 2017). War damages are calculated as the monetary value of physical assets that are destroyed (and stolen) or partially damaged (but still suitable for repairing/recovery) due to military actions and occupation. War losses estimate the foregone revenue due to lower quantities of goods produced and additional costs the producers bear because of the war.

Figure 1 Agricultural war damages and losses in Ukraine



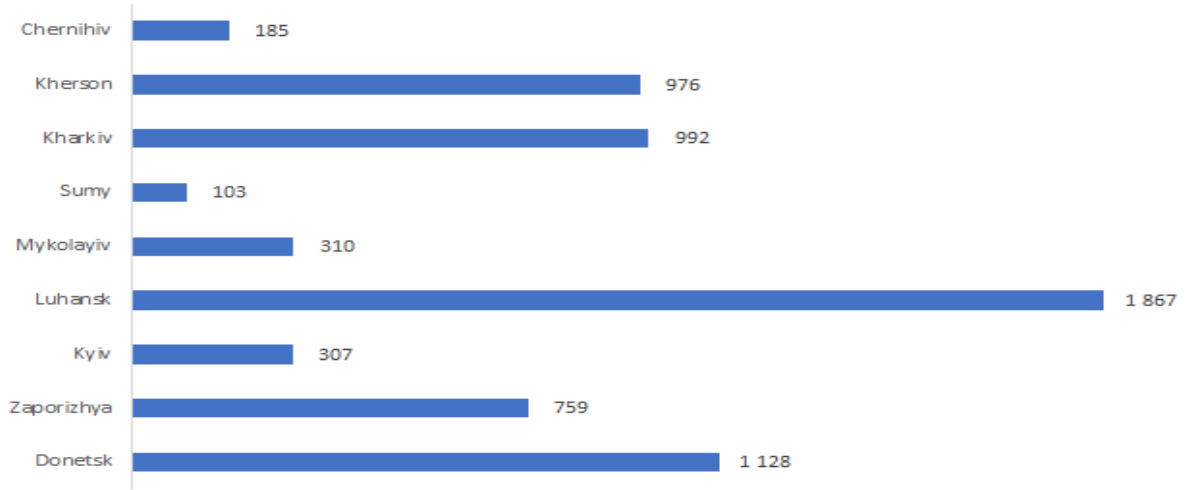
Source: own presentation using the KSE Agrocenter (2022)

2.1 Almost a quarter of the sector has been destroyed

The amount of the physical damages to agriculture piled up to US$ 6.6 billion in September, which is equivalent to 23% of the total value of Ukrainian agricultural assets. In other words almost a quarter of Ukraine's agricultural sector has been destroyed and the toll is increasing (Figure 1).

At the regional level, naturally the most affected regions in terms of damages are the oblasts where the active military activities have been taking place (), i.e. in Luhansk (US$ 1.8 bn), Donetsk (US$ 1.1 bn), Kharkiv (US$ 992 mln), Kherson (US$ 976 mln), and Zaporizhya oblasts (US$ 759 mln).

Figure 2 Regional breakdown of agricultural war damages

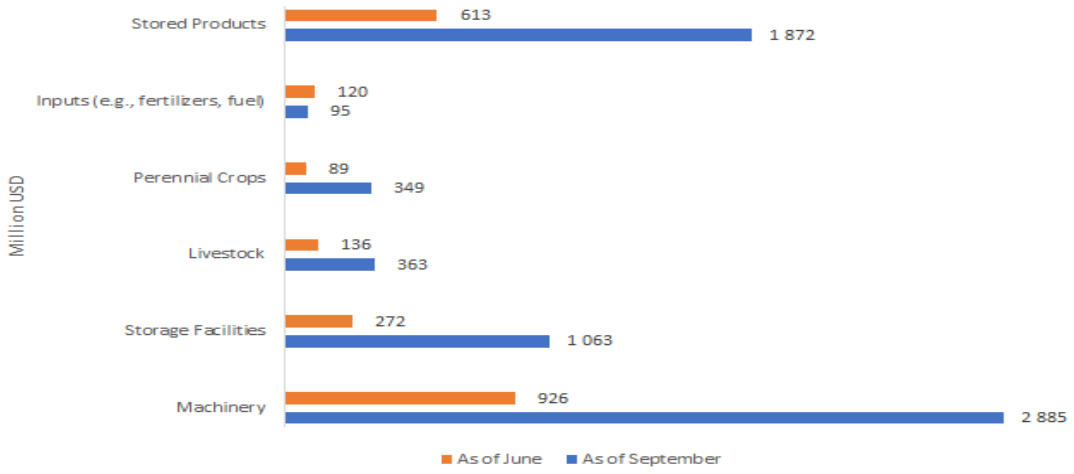


Source: own presentation using the KSE Agrocenter (2022)

At a more detailed level (Figure 3), agricultural machinery (US$2.9 billion or 84.2 thousand units) and stored products (US$1.9 billion or 2.8 mln t of grains and 1.2 mln t of oilseeds) are the two most heavily

affected categories. Stored products category also contains a grain and other agricultural products that was stolen on a massive scale on occupied territories and that was documented in various journalist investigations (BBC, 2022). These categories are followed by damages to storage facilities (US$1.1 billion or 9.4 mln t of storage capacity), damages to livestock ($362 mln or 95 000 sheeps and goats, 212 000 cattle, 507 000 pigs and almost 11.7 mln of chickens), damaged perennial crops (almost US$346 mln or 14.3 ha), and finally destroyed and stolen inputs (almost US$95 million or 600 000t of agrichemicals, 124 000 t of fertilizers, and 11.5 mln t of fuel).

Figure 3 Agricultural Damages Categories

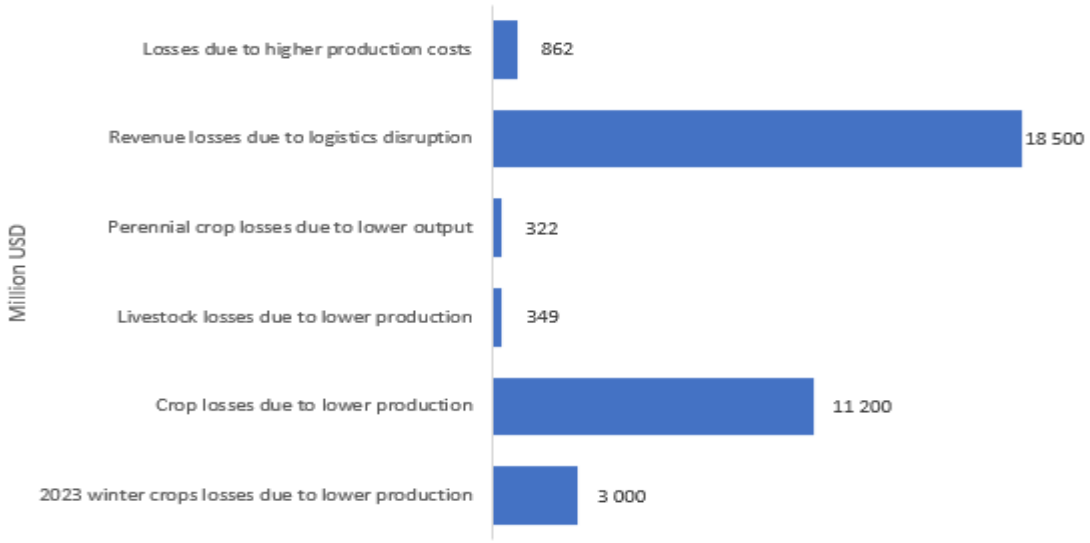


source: own presentation using the KSE Agrocenter (2022)

2.2 Despite high world market prices the farmers in Ukraine suffer huge losses

While the estimated damages reflect the destruction of tangible assets and inventories, the losses estimate the foregone revenue due to lower yields and/or prices and due additional costs accrued because of the war. In Ukraine's agricultural case the losses are already enormous and reached US$ 34.3 bn in September, which is roughly 75% of the last year gross agricultural output. Forgone revenues due to export disruptions and lower yields are the two major categories of losses (Figure 4).

Figure 4 Agricultural Losses Categories



Source: own presentation using the KSE Agrocenter (2022)

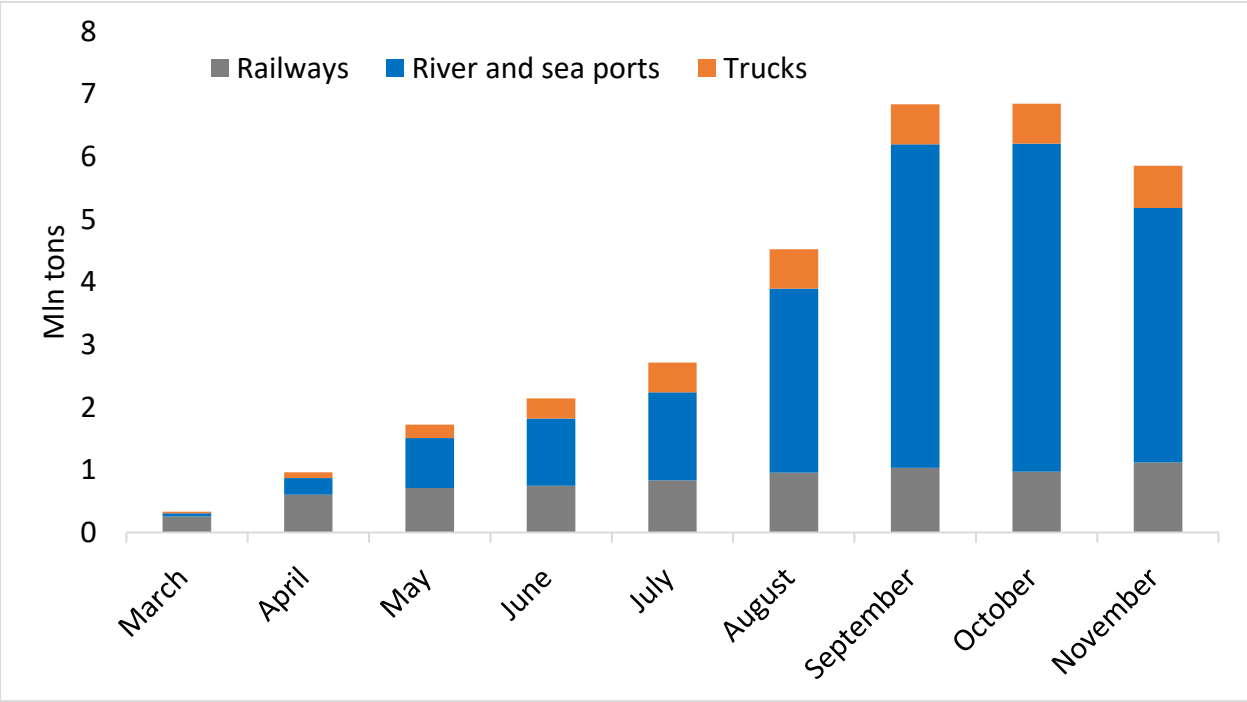
2.2.1 Export disruptions deprive the farmers of liquidity

Virtually all agricultural exports from Ukraine (about 93% and mainly grains, oilseeds and sunflower oil) have been delivered to export destinations mainly in Northern Africa, Middle East and Europe by the sea via its Black Sea ports (Kirby, 2022). Since the first days of Russian invasion, however, Ukraine's Black and Azov sea ports were either occupied or blocked by Russian naval fleet, thereby triggering panic and extreme growth of international prices (Ihle et al, 2022). Huge mass of exportable surpluses of grains and sunflower oil stuck in Ukraine's ports and in inland elevators, and alternative export routes had to be exploited by agricultural traders and producers. The latter included land transportation by trucks and railways via the Ukraine's western borders and via the ports on the Danube River. These alternative export routes, however, have been more expensive and with a limited scope for toping up the shipments. In the course of the summer 2022, Ukraine was able to increase its railways agricultural export shipments only to about 1 mln tons per month (Figure 5). Exports by trucks have also been limited to 0.6 mln tons per month (MAPFU, 2022), with the lines of trucks at the border stretching sometimes to more than 50 km (Ukrinform, 2022) and weekly trucks waiting time at the border, thus putting up the export costs. Respectively, the total shipment capacity of alternative routes fell substantially short of the demand and of the pre-war monthly shipments (Laborde and Glauber, 2022b), which led to oversupplies exhausting the existing domestic storage capacities, in particular in the face of the incoming new 2022 harvest (Kirby, 2022). Due to more expensive and longer alternative export routes via the western border and via the Danube river ports, export costs surged from the pre-war 30-40 USD/t to 150-200 USD/t (Striewe, 2022). Inflated export costs severely depressed domestic grain prices to the level hardly sufficient to cover production costs (Figure 2). These simply deprived Ukrainian grains and oilseeds farmers from revenues and drove them nearly to the edge of bankruptcy.

Striking a so-called Grain Deal between Russia and Ukraine for 120 days, moderated by Turkey and UN (UN, 2022; Glauber and Laborde, 2022b) and establishing a so-called grain corridor from the three deep-water Black Sea ports (Odesa, Chornomorsk, and Pivdennyi) allowed increasing agricultural exports from Ukraine substantially, with, however, only marginal effect on domestic prices and farmers' incomes. The

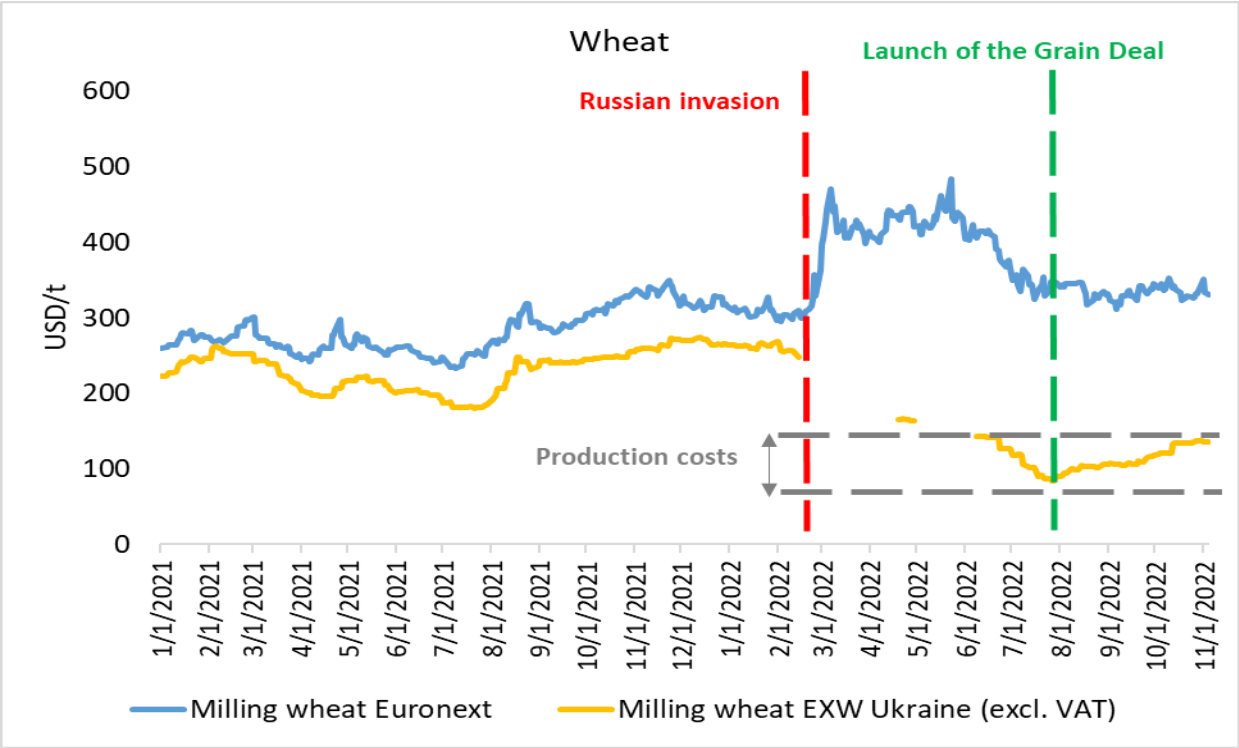
Grain Deal came into force in August, when the 2022 harvest already started. Therefore, despite monthly grains exports returned to the pre-war levels (Figure 3), the supply pressure on the domestic market was not eliminated, export costs remained almost at the pre-corridor high level and the domestic prices stayed depressed and low, without any noticeable sign to close the gap with respect to the world market prices (Figure 2). Moreover, the volume of the shipments via the corridor first levelled off in October and then decreased in November (Figure 7). Continued accusation and questioning of the Grain Deal from the Russian side undermined the security of the grain corridor (Ukragroconsult, 2022), which was especially unfortunate taking into account a beginning of the high export season in Ukraine. The issue culminated in Russia's suspension of its participation in the Grain Deal (Laborde and Glauber, 2022) shortly before its expiration, though shortly afterwards it was back and the Grain Deal was extended for another 120 days.

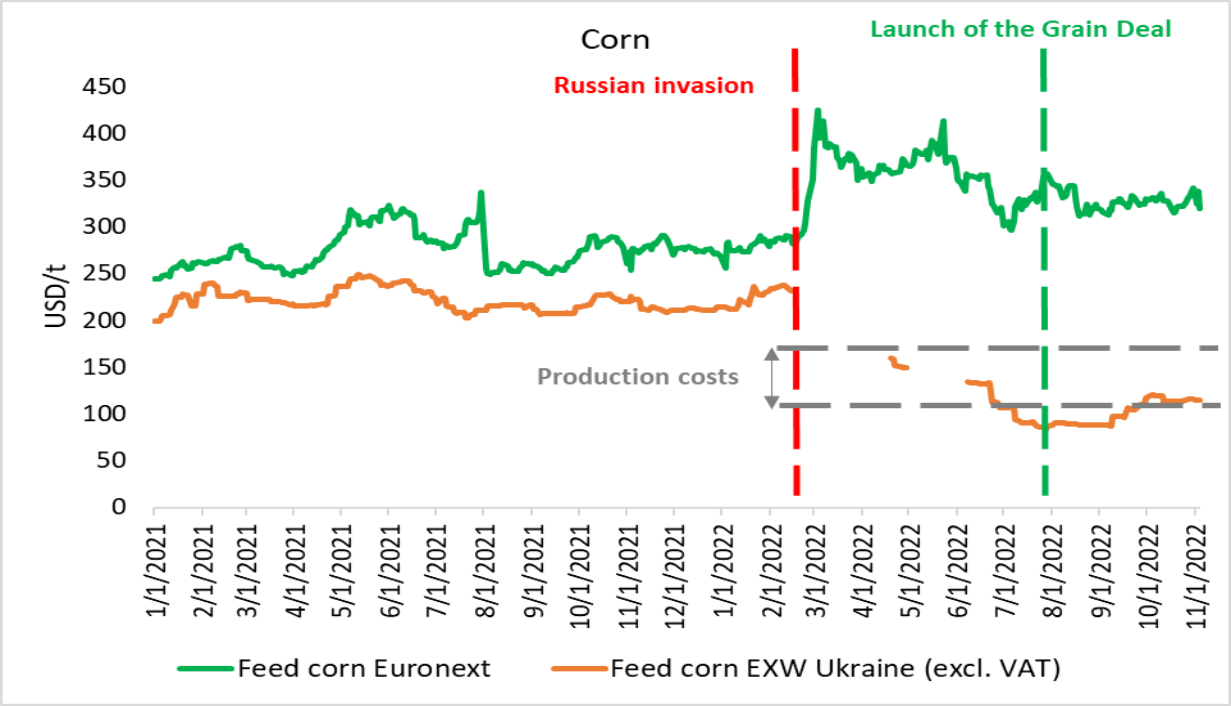
Figure 5 Export of grains and oilseeds from Ukraine since the start of the full-scale invasion in 2022, by the mode of transportation



Source: Ministry of Agricultural Policy and Food of Ukraine - MAPFU (2022)

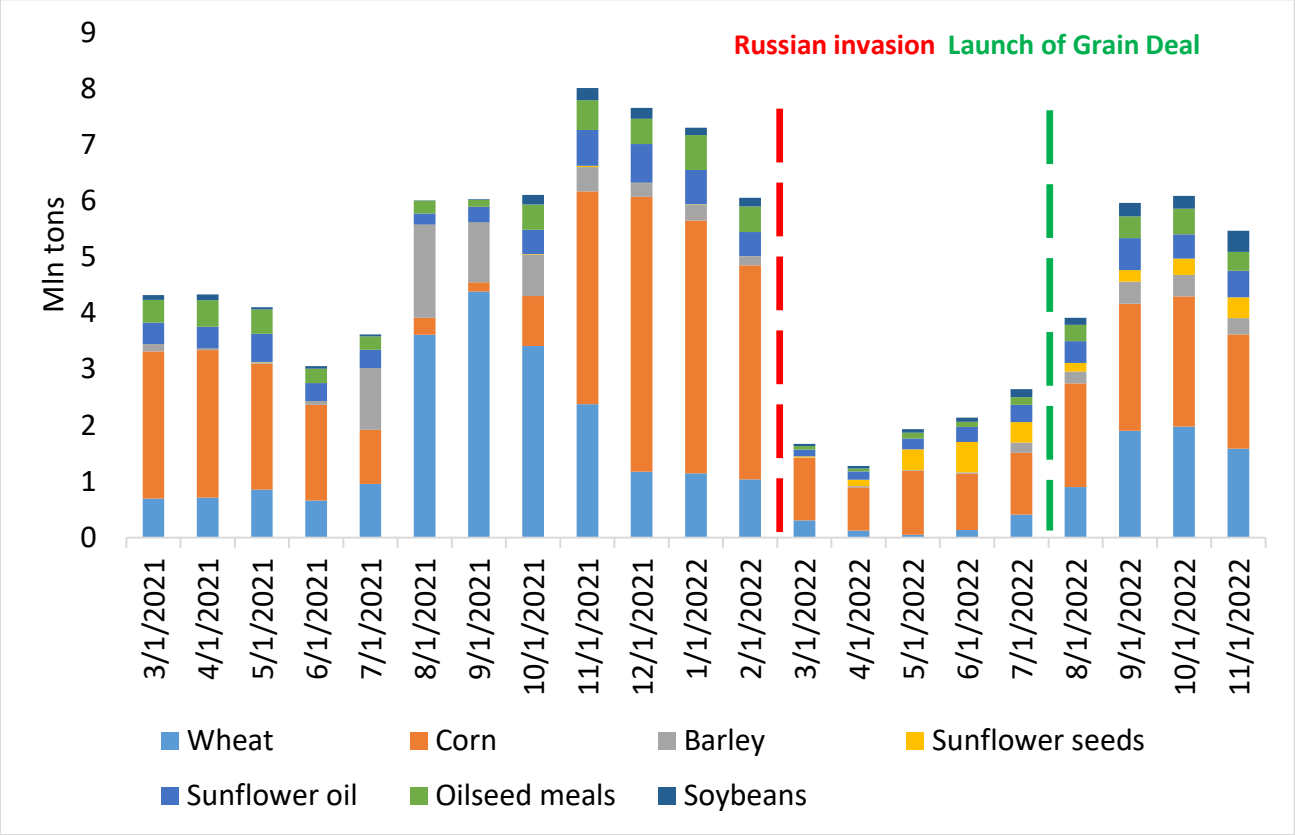
Figure 6 Wheat and corn prices before and after the full-scale Russian invasion





Source: own presentation based on the UkrAgroConsult price data. Note: the production costs' ranges are indicative, based on the information received from the farmers and are provided only to guide a reader with respect to expected profitability of the grain business in Ukraine

Figure 7 Export of grains and oilseeds from Ukraine before and after the full-scale Russia's invasion



Source: own presentation using the data from the State Statistics Service of Ukraine

2.2.2 Lower yields and crop losses

The second major component in total losses (US$ 11.2 billion) is crop losses that was due to the two key factors. First is the reduction in the harvested areas, since a substantial amount of crops was produced in on the territories directly affected by the hostilities. Second is that due to increased input costs and constrained liquidity, the farmers reduced their application rates of fertilizers and agrichemicals, thus cutting the crop yields.

3. Concluding remarks and continued threats to global food security

Mounting agricultural damages and losses due to the Russia's invasion make Ukraine's agricultural outlook rather grim and a subject for increasing concerns for a global food security. USDA expects Ukraine to produce about 75 mln tons of wheat, barley, corn, sunflower seeds, rapeseeds, and soya in the 2022/23 season or 31% less than last year. Ukrainian Grain Association (UGA) and the Ministry of Agrarian Policy and Food of Ukraine, however, are less optimistic and their expected harvest of grains and oilseeds is only 63 mln tons (UGA, 2022). Moreover, due to the rainy fall and huge liquidity problems that were mentioned above, 2022 harvesting is delayed in Ukraine. As of 1st of December 2022, Ukrainian farmers harvested slightly more than 50% of the 2022 grains[2], and planted only about 40%[3] of the last year winter crops

[2] https://minagro.gov.ua/news/zbirannya-zernovih-ta-zernobobovih-nablizhayetsya-do-zavershennya
[3] https://latifundist.com/en/novosti/60371-sivba-ozimini-na-finishnij-pryamij

areas. These mean that the current projections for the current and next season may even be optimistic, and this is bad news for the mounting global food insecurity. In the current global supply and demand conditions, the global market have been tight (von Cramon-Taubadel, 2022) and 2022/23 global stocks might even drop. At the same time, the capacity to replace the expected missing exports from Ukraine in the world are limited (Glauber et al, 2022). In other worlds but by no means exaggerated, every ton of grains from Ukraine will count this and next season!

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