



# Ukraine Grain Transportation

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## Executive Summary

The USDA/Agricultural Marketing Service's 2023 Ukraine Grain Transportation report includes new 2022 data and covers important developments from 2021 to 2022. The Black Sea region (Kazakhstan, Russia, and Ukraine) is a strong player in the global wheat and corn markets. Before Russia's full-scale invasion of Ukraine, the Black Sea wheat successfully competed in the global market based on lower prices, favorable exchange rates, and the region's advantageous location. Ports on the Black Sea can easily access the rapidly growing markets in the Middle East and North Africa, where wheat and feed demand has grown. The U.S. share of the global wheat market has declined, as the European Union's (EU) and Russia's shares have risen. In the corn market, the United States is still the leading exporter, but faces strong competition from Brazil, Argentina, and Ukraine—despite logistical challenges posed by the war.

Published annually since 2020, the Ukraine Grain Transportation report evaluates grain transportation costs as an indicator for the entire Black Sea Region. The report analyzes the major changes and events influencing the total costs of shipping grain from Ukraine to major export markets. These costs also affect the overall competitiveness of the United States in serving global grain markets.

From 2021 to 2022, following the Russian Federation's full-scale invasion of Ukraine that began on February 24, 2022, Ukraine's transportation costs more than doubled. Also, from 2021 to 2022, the share of Ukrainian grain exports shipped via the Black Sea ports fell from 96 percent to 69 percent. Similarly, rail's share of grain movements destined to ports for export fell from 60 percent to 40 percent. According to [Wilson et al.](#), prior to the war, Ukrainian transportation costs were among the lowest in the world for exporting grain, but became among the highest after the conflict began.

## Overview of Ukrainian Grain Transportation in 2022<sup>1</sup>

Ukraine's wheat exports fell sharply, because of logistical issues spawned by Russia's war on Ukraine: wheat exports were down 44 percent, from 20 million metric tons (mmt) in 2021 to 11.2 mmt in 2022. Corn exports increased 2 percent, from 24.7 mmt in 2021 to 25.2 mmt in 2022 ([State Customs of the Ukraine](#)).<sup>2</sup> The rise in corn exports is partly explained by the fact that Ukrainian shippers exported not only the 2021 corn harvest (as is typically done), but also the current year's (2022) crop. Because of war-related shortages of cash and storage capacity, growers had to export the current crop, despite high logistic costs and low prices to Ukraine farmers. The cost of shipping a metric ton (mt) of grain 100 miles by truck increased 38 percent, from \$13.23 per mt

1 Andrii Shkliar ([andrii.shkliar@cfts.org.ua](mailto:andrii.shkliar@cfts.org.ua)) and Andrey Isayev ([andrey.isayev@cfts.org.ua](mailto:andrey.isayev@cfts.org.ua)) gathered all of the Ukraine data in this report and ensured its accuracy.

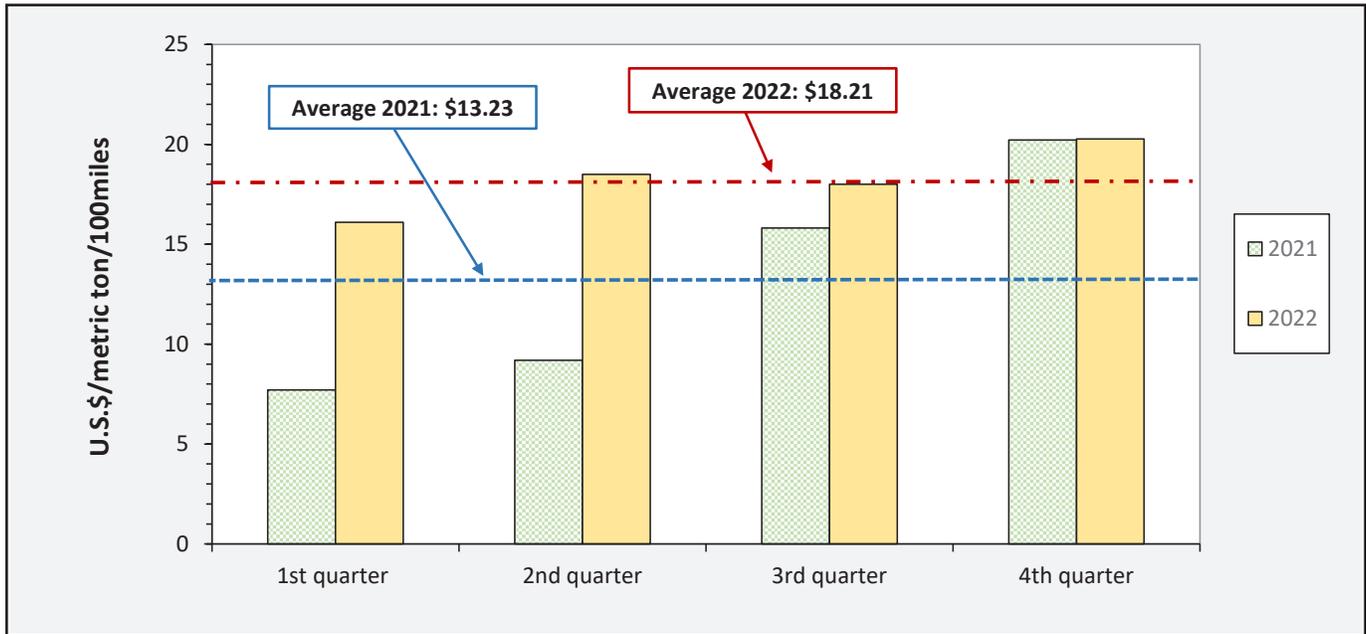
2 Ukrainian grain, especially corn, is usually harvested in the fall and exported in the spring and summer of the new calendar year, depending on market price and port capacity. Farmers in Ukraine produced 42 mmt in marketing year (MY) 2021/22 (24 percent above the 3-year average) and an estimated 27 mmt in MY 2022/23. This is USDA latest forecast as of June 2023. Thus, 2022 corn export volumes reflected, in part, 2021's high harvested volumes. These high volumes also contributed to high fourth quarter 2021 truck rates. The corn marketing year is from October-September, and the wheat marketing year is from July-June.



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in 2021 to \$18.21 per mt in 2022 (fig. 1a) ([Zernovoz](#)). Truck rates rose because of higher demand for trucks to ship across Ukraine's western border and because of higher operating costs, such as fuel and spare parts.

**Figure 1a. Ukrainian wheat, corn, and soybeans export truck cost index, 2021-22**



Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, Zernovoz Kyiv, Ukraine; and USDA, Agricultural Marketing Service.

From 2021 to 2022, rail rates rose largely because of a shortage of grain hoppers, as well as significant increases in rental fees for grain hoppers in the second half of 2022. The grain hopper rental fees rose from \$74.07 per day in June 2022 to \$117.59 per day in December 2022 ([Centre for Transport Strategies \(CFTS\)](#)).<sup>3</sup>

Ukrainian grain and oilseed inland transportation saw major shifts in 2022, in terms of modal share.<sup>4</sup> From 2021 to 2022, rail and barge shipments through Ukraine's seaports were down significantly, while truck seaport exports rose. Trucking's share of the seaport-export market rose from 31 percent to 60 percent, while rail's share declined from 60 percent to 40 percent (table 1a) and barge's share fell to zero. In January and February 2022, there were no export shipments by barge because the Dnipro River was closed due to winter conditions. Then, from March through December, barge shipments were suspended for security reasons related to Russia's invasion (table 1a) ([Ukrainian Railways](#), [Ukrainian Sea Ports Authorities](#), and [CFTS](#)).

<sup>3</sup> Rental hopper prices (cited here and in the next paragraph) do not include the value-added tax.

<sup>4</sup> Grain refers to corn and wheat.



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**Table 1a. Tonnages and modal shares for Ukrainian grain and oilseed exports through Ukrainian seaports, 2018-22**

Year & Type of Movement	Rail		Barge*		Truck	
	1,000 Tons	Percent	1,000 Tons	Percent	1,000 Tons	Percent
2018	30,083	76%	3,700	9%	5,850	15%
2019	36,707	69%	5,650	11%	10,667	20%
2020	29,406	64%	4,030	9%	12,694	28%
2021	28,495	60%	4,300	9%	14,500	31%
2022	10,155	40%	-	-	15,033	60%

\*From January-February 2022, navigation on the Dnipro River was closed because of winter conditions. From March to December 2022, navigation was also closed for security reasons related to the Russian invasion. From 2018 to 2019, barge volumes include those for the Southern Bug River, and 2020-21 volumes include those for the Dnipro and Southern Bug Rivers.  
Source: Ukrainian Railways, Ukrainian Sea Ports Authorities, and Centre for Transport Strategies.

The maritime share of total grain and oilseed exports declined from more than 96 percent in 2021 to about 69 percent in 2022. From March 2022 to July 2022, Russia blocked all of Ukraine’s deep-sea ports, and Ukraine’s exports decreased dramatically. Ukrainian exporters were forced to develop alternative export routes that were not as efficient or cost effective as the traditional seaborne routes through the ports of the Odesa and Mykolaiv regions (fig. 1b). Partially, the problem was solved by reorienting export flows by rail through western border crossing points and through the ports located on the Danube River: Izmail (Ukraine), Reni (Ukraine) and Constanza (Romania) (fig. 1b).<sup>5</sup> However, the throughput capacity of these routes allowed for only a fraction of the exports seeking trade routes.<sup>6</sup> Despite that decline (through the three Black Sea and Danube ports), maritime transport remains the lowest-cost mode of transportation. Railway transport suffered from limited throughput capacity via western Ukrainian border crossings.<sup>7</sup> According to the Ministry of Agrarian Policy and Food of Ukraine—of Ukraine’s total grain and oilseed exports through the European Union (EU), rail’s share was 24 percent, and truck’s share was 7 percent. A small amount of agricultural exports were shipped by ferry.

5 Grain is transported to the Izmail and Reni ports by rail and trucks. Part of it then is exported by small coaster vessels directly to the ports of destination, while another part is loaded into barges and transported to the Constanza port to be reloaded into seagoing vessels. Coaster vessels suitable for navigation on the Lower Danube carry loads of up to 5,000 deadweight tonnage (dwt) ([Centre for Transport Strategies \(CFTS\)](#)). Deadweight (dwt) is a unit of measure for ship-carrying capacity. It is calculated as the sum of the weights of cargo, fuel, fresh water, ballast water, provisions, passengers, and crew.

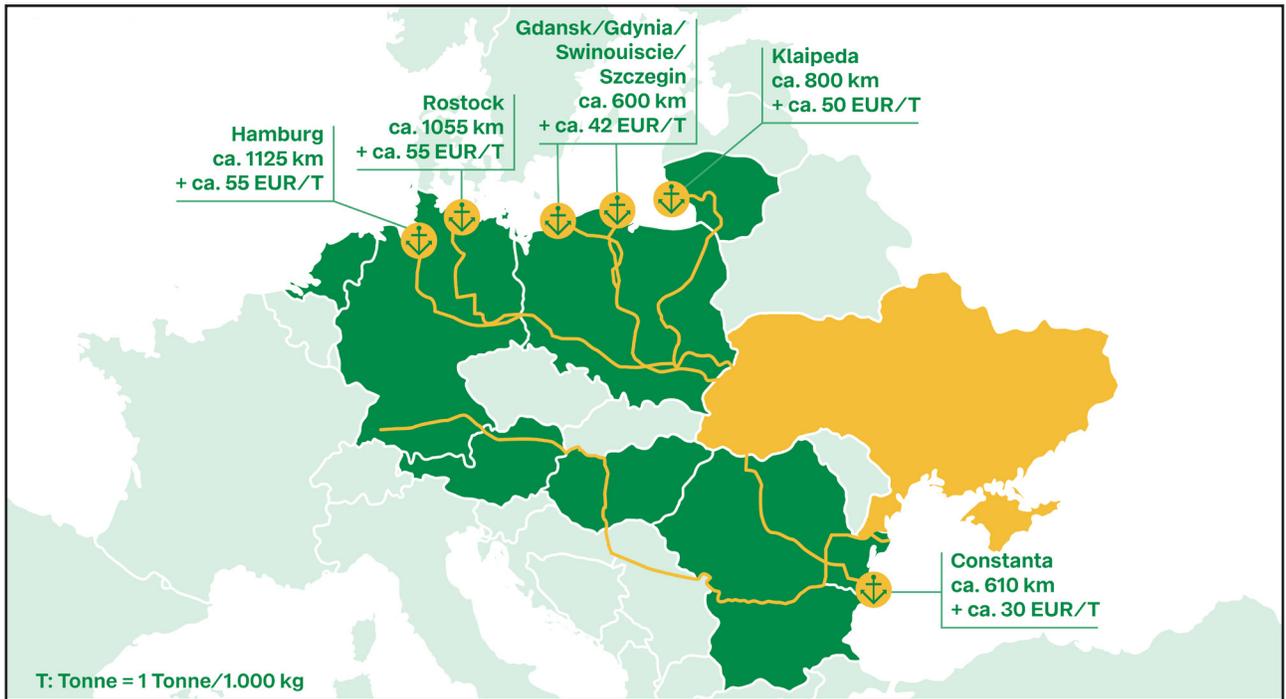
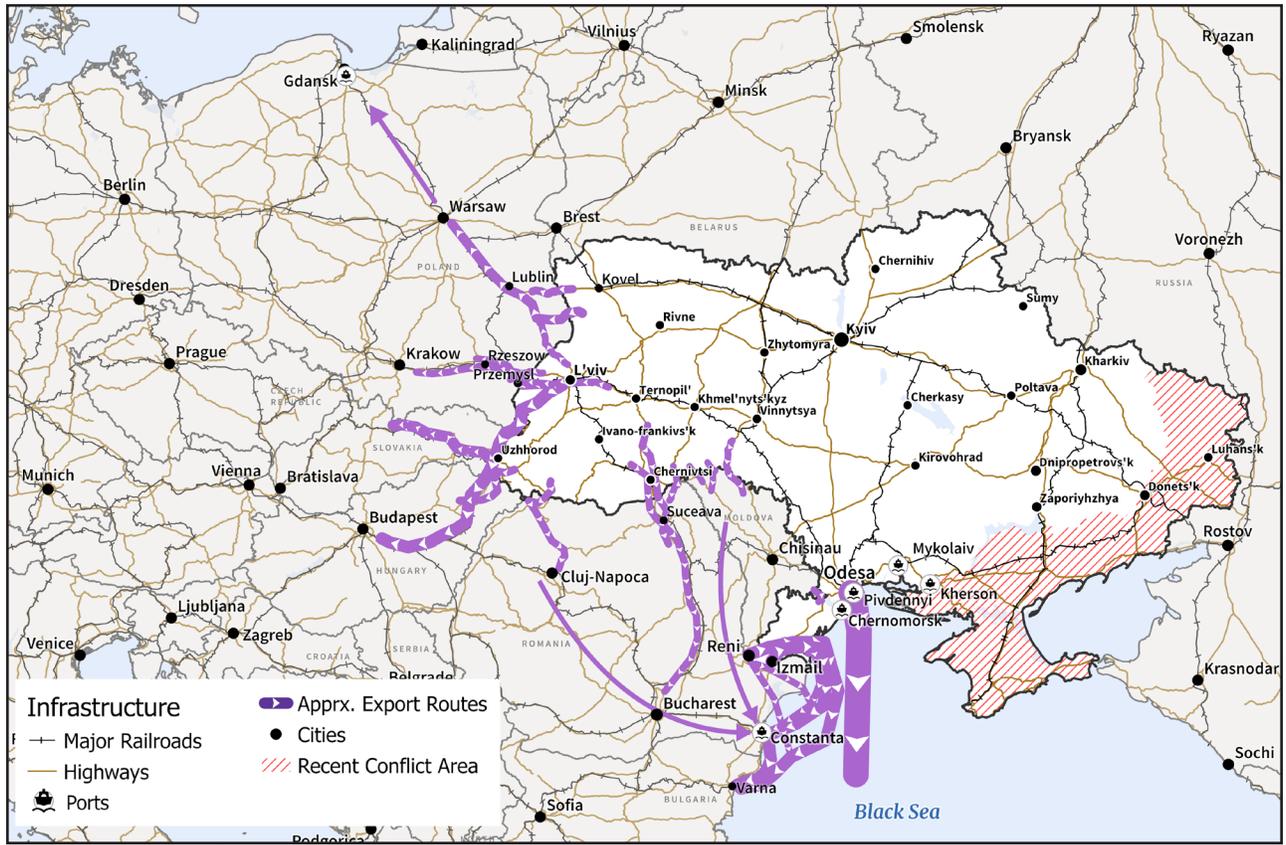
6 Last year, the *European Union (EU)-Ukraine Solidarity Lanes* plan exempted Ukrainian crops from tariffs to facilitate grain exports by land. On April 28, 2023, the EU agreed to exempt Ukrainian crops from tariffs for another year. However, under the new agreement some Ukrainian crops will move through Poland, Hungary, Slovakia Bulgaria, and Romania but will not be sold in these countries. The EU will also provide \$110 million in compensation to these countries’ farmers, according to press reports ([Wall Street Journal](#)).

7 The gauge, or gap, between tracks on Ukrainian railway lines is wider than that of its European neighbors—a discrepancy that makes border crossings laborious and time consuming: either cargo must be fully unloaded and reloaded on to a new train, or else each wagon must be transferred on to a different set of wheels ([Ukraine Grain Transportation 2021](#)).



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Figure 1b. Key alternative routes and ports used for export of Ukrainian grain (as of April 2023)



**Top map:** Note: War zones are approximate, as of March 7, 2023. Estimates based on ± 15 km buffer from conflict zones. Sources: The sources used to build the map: MinAg Ukraine, Institute for the Study of War, Elevatorist.com, Environmental Systems Research Institute, Inc. (ESRI), North American Cartographic Information Society (NACIS), and Lloyd's List. USDA/Agricultural Marketing Service (AMS) and USDA/Foreign Agricultural Service (FAS) constructed the map.

**Bottom map:** Source: Ministry of Agrarian Policy and Food of Ukraine.



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Because of the impacts of the war, ocean freight rates rose from Odesa to Alexandria, Egypt; Ciwandan/Cigading, Indonesia; and the Southern ports, China. The region's maritime trade suffered not just in terms of volumes, but also in the quality of assets operating in the area: unwilling to face the risks of war, large, modern ships departed, leaving only small and old ships to transport grain ([S&P Global Commodity Insights](#), [Lloyd's List](#), and [Wilson 2023](#)). The average vessel size declined 13 percent to just over 52,000 dwt in 2022—such that small cargoes were loaded into increasingly smaller, coaster vessels ([S&P Global Commodity Insights](#)). [Lloyds of London](#) listed the Black Sea and Sea of Azov waters as an area of “Hull War, Piracy, Terrorism and Related Perils.” The insurer noted that even ships entering areas that were not close to Ukraine required an additional insurance policy for war risk. The cost of hiring ships to transport commodities from the Black Sea has risen, partly reflecting the higher, war-risk insurance rates ([Reuters](#)).<sup>8</sup>

From late February to late June 2022, no shipments left the three key ports of Chornomorsk, Odesa, and Pivdennyi, until the Black Sea Grain Initiative opened the trade corridor at the end of July.<sup>9</sup> In 2021, these three ports had exported 29.9 mmt of grain, accounting for 63 percent of Ukraine total grain exports (47.3 mmt) ([Ukraine Grain Transportation 2021](#)). Under the Black Sea Grain Initiative (August-December), these three key ports exported 14.4 mmt of grain and oilseeds to 42 countries of Africa, Asia-Pacific, and Europe. Ukraine exported 1.6 mmt of corn to China, accounting for 22 percent of Ukraine's total corn exports under the Grain Initiative (7.3 mmt). The next highest shares of Ukraine's corn exports (in declining order) went to Spain, Italy, Turkey, Netherlands, and Egypt. Spain, which faced a drought in 2022, accounted for 24 percent (1.1 mmt) of Ukraine's total wheat exports (4.6 mmt). The next highest shares of Ukraine's wheat exports (in declining order) went to Turkey, Indonesia, Bangladesh, Italy, and Egypt ([Joint Coordination Centre for the Black Sea Grain Initiative](#)).

From 2021 to 2022, transport costs increased, and farm prices declined, lowering landed costs for Ukrainian wheat and corn from Odesa to Alexandria, Egypt; Ciwandan/Cigading, Indonesia; and Shanghai, China.<sup>10</sup> As a share of total landed costs, the transportation costs rose 79 to 131 percent for the route from Central Ukraine through the ports of Odesa (tables 2a and 2b). The drop in farm prices indicates that—to remain competitive in the world market—farmers absorbed the cost increase of delivering Ukrainian grain. Average wheat farm prices in Ukraine fell 31 percent from \$273.08 per mt in 2021 to \$188.24 per mt in 2022 (table 2a). Over the same period, average corn farm prices fell 36 percent from \$270.12 per mt to \$171.53 per mt (table 2b).

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8 War-risk insurance is a type of insurance that protects against losses resulting from war or other acts of violence. The coverage of this additional risk is offered separately from standard insurance policies ([Investopedia](#)).

9 The Black Sea Grain Initiative is two separate agreements between Turkey and the United Nations with Ukraine and Russia individually to establish a humanitarian maritime corridor for the safe passage of ships from Ukraine. The initiative specifically allows for significant volumes of commercial food exports from three key Ukrainian ports in the Black Sea—Odesa, Chornomorsk and Pivdennyi (previously name Yuzhny) ([United Nation](#)). Pivdennyi is a commercial seaport in the Ukrainian city of Yuzhne near Odesa, on the Black Sea coast.

10 Landed costs = total transportation costs + farm price.



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**Table 2a. Average costs of transporting Ukrainian wheat from the Black Sea ports to Egypt and Indonesia, 2021-22**

	To Alexandria, Egypt					
	From Central Ukraine <sup>1</sup> - Odesa <sup>2</sup>			From Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup>		
	—US\$/mt—		% Change	—US\$/mt—		% Change
	2021	2022	2021-22	2021	2022	2021-22
Truck	7.09	8.80	24.1	7.09	8.80	24.1
Rail <sup>3</sup>	11.89	21.67	82.2	8.89	16.12	81.3
Ocean	25.88	53.99	108.6	28.63	--na--	--na--
Total transportation	44.86	84.69	88.8	44.61	--na--	--na--
Farm price <sup>4</sup>	273.08	188.24	-31.1	273.08	188.24	-31.1
Landed cost	317.94	281.82	-11.4	317.69	--na--	--na--
Transport % of landed cost	14.0	32.0	127.9	13.98	--na--	--na--
	To Ciwandan/Cigading, Indonesia					
	From Central Ukraine <sup>1</sup> - Odesa <sup>2</sup>			From Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup>		
	—US\$/mt—		% Change	—US\$/mt—		% Change
	2021	2022	2021-22	2021	2022	2021-22
Truck	7.09	8.80	24.1	7.09	8.80	24.1
Rail <sup>3</sup>	11.89	21.67	82.2	8.89	16.12	81.3
Ocean	54.92	84.98	54.7	57.67	--na--	--na--
Total transportation	73.90	115.69	56.5	73.65	--na--	--na--
Farm price <sup>4</sup>	273.08	188.24	-31.1	273.08	188.24	-31.1
Landed cost	346.98	312.82	-9.8	346.73	--na--	--na--
Transport % of landed cost	21.3	38.8	82.3	21.2	--na--	--na--

<sup>1</sup>Central Ukraine producing regions are as follows = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

<sup>2</sup>Export ports. The Port of Odesa was closed during the second quarter of 2022. The freight average was calculated based on the first, third, and fourth quarters of 2022. The Port of Mykolaiv has remained closed to navigation since the second quarter of 2022.

<sup>3</sup>Rail rates include the cost of delivery to the railway station and the cost of renting a grain hopper. However, rail rates do not include the cost of moving and positioning rail cars at the elevator and port, railway station fees, security service from loading to discharging port, or freight-forwarding service. (Any or all of these items could exceed the rail tariff rate.) Rail rates are estimated by using specialized software “TM-Karta” in accordance with Ukrainian Railways (Ukrzaliznytsia) tariff regulation.

<sup>4</sup>Farm price = elevator price – handling costs – farm-to-elevator transportation.

Note: mt = metric ton; na = not available.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



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**Table 2b. Average costs of transporting Ukrainian corn from the Black Sea ports to Egypt and China, 2021-22**

	To Alexandria, Egypt					
	From Central Ukraine <sup>1</sup> - Odesa <sup>2</sup>			From Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup>		
	—US\$/mt—		% Change	—US\$/mt—		% Change
	2021	2022	2021-22	2021	2022	2021-22
Truck	7.09	8.80	24.1	7.09	8.80	24.1
Rail <sup>3</sup>	11.89	21.67	82.2	8.89	16.12	81.3
Ocean	25.88	53.99	108.6	28.63	--na--	--na--
Total transportation	44.86	84.69	88.8	44.61	--na--	--na--
Farm price <sup>4</sup>	270.12	171.53	-36.5	270.12	171.53	-36.5
Landed cost	314.98	262.93	-16.5	314.72	--na--	--na--
Transport % of landed cost	14.3	33.8	136.8	14.2	--na--	--na--
	To Shanghai, China					
	From Central Ukraine <sup>1</sup> - Odesa <sup>2</sup>			From Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup>		
	—US\$/mt—		% Change	—US\$/mt—		% Change
	2021	2022	2021-22	2021	2022	2021-22
Truck	7.09	8.80	24.1	7.09	8.80	24.1
Rail <sup>3</sup>	11.89	21.67	82.2	8.89	16.12	81.3
Ocean	50.96	79.92	56.8	53.71	--na--	--na--
Total transportation	69.94	110.63	58.2	69.69	--na--	--na--
Farm price <sup>4</sup>	270.12	171.53	-36.5	270.12	171.53	-36.5
Landed cost	340.06	288.87	-15.1	339.81	--na--	--na--
Transport % of landed cost	20.6	39.7	93.0	20.5	--na--	--na--

<sup>1</sup>Central Ukraine producing regions are as follows = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

<sup>2</sup>Export ports. The Port of Odesa was closed during the second quarter of 2022. The freight average was calculated based on the first, third, and fourth quarters of 2022. The Port of Mykolaiv has remained closed to navigation since the second quarter of 2022.

<sup>3</sup>Rail rates include the cost of delivery to the railway station and the cost of renting a grain hopper. However, rail rates do not include the cost of moving and positioning rail cars at the elevator and port, railway station fees, security service from loading to discharging port, or freight-forwarding service. (Any or all of these items could exceed the rail tariff rate.) Rail rates are estimated by using specialized software “TM-Karta” in accordance with Ukrainian Railways (Ukrzaliznytsia) tariff regulation.

<sup>4</sup>Farm price = elevator price – handling costs – farm-to-elevator transportation.

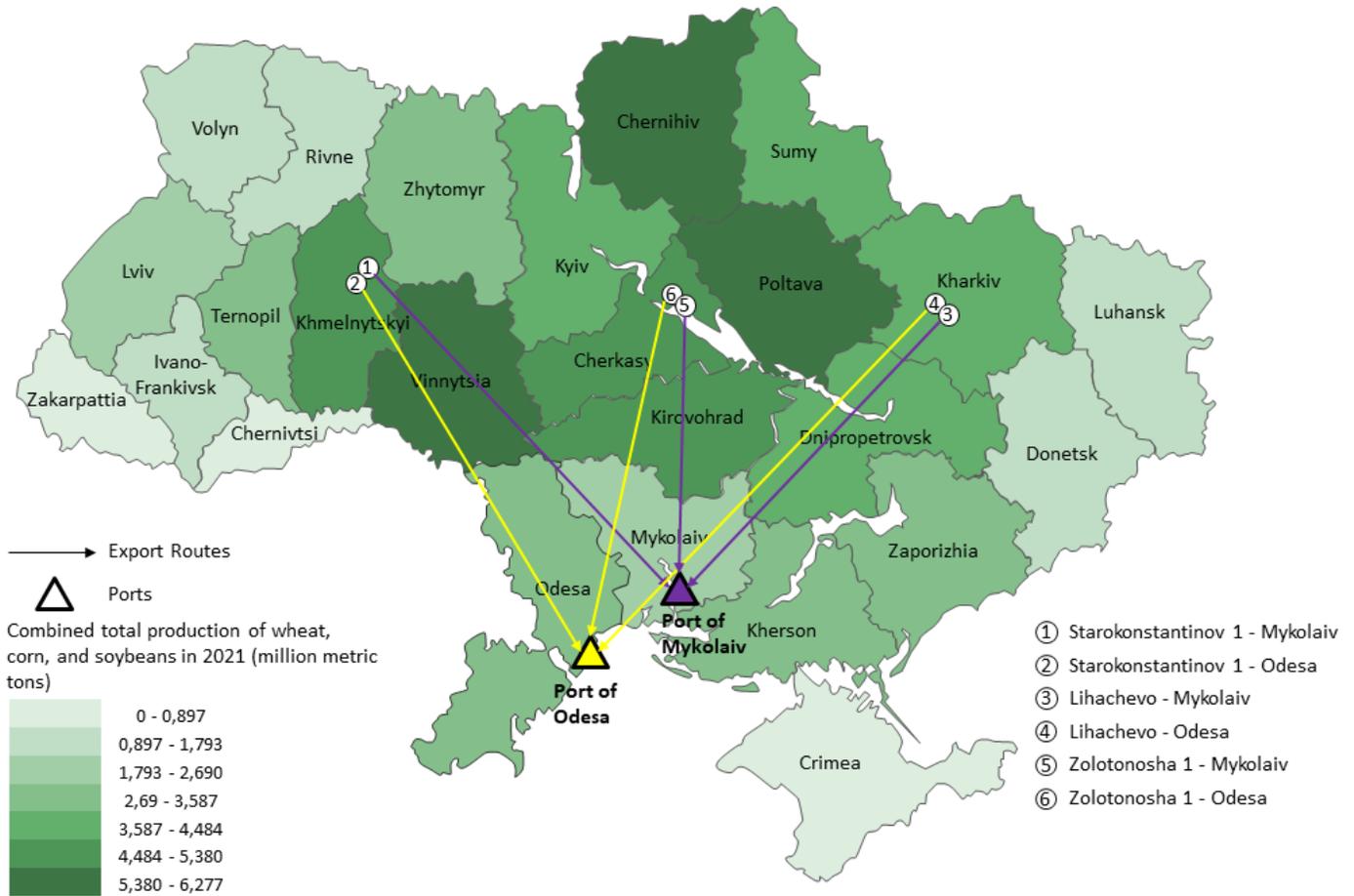
Note: mt = metric ton; na = not available.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Figure 2. Routes<sup>1</sup> and wheat, corn, and soybean regions considered in the Ukrainian grain export transportation indicator<sup>2</sup>**



<sup>1</sup>Table 5 on page 14 provides additional information for routes 1-6.

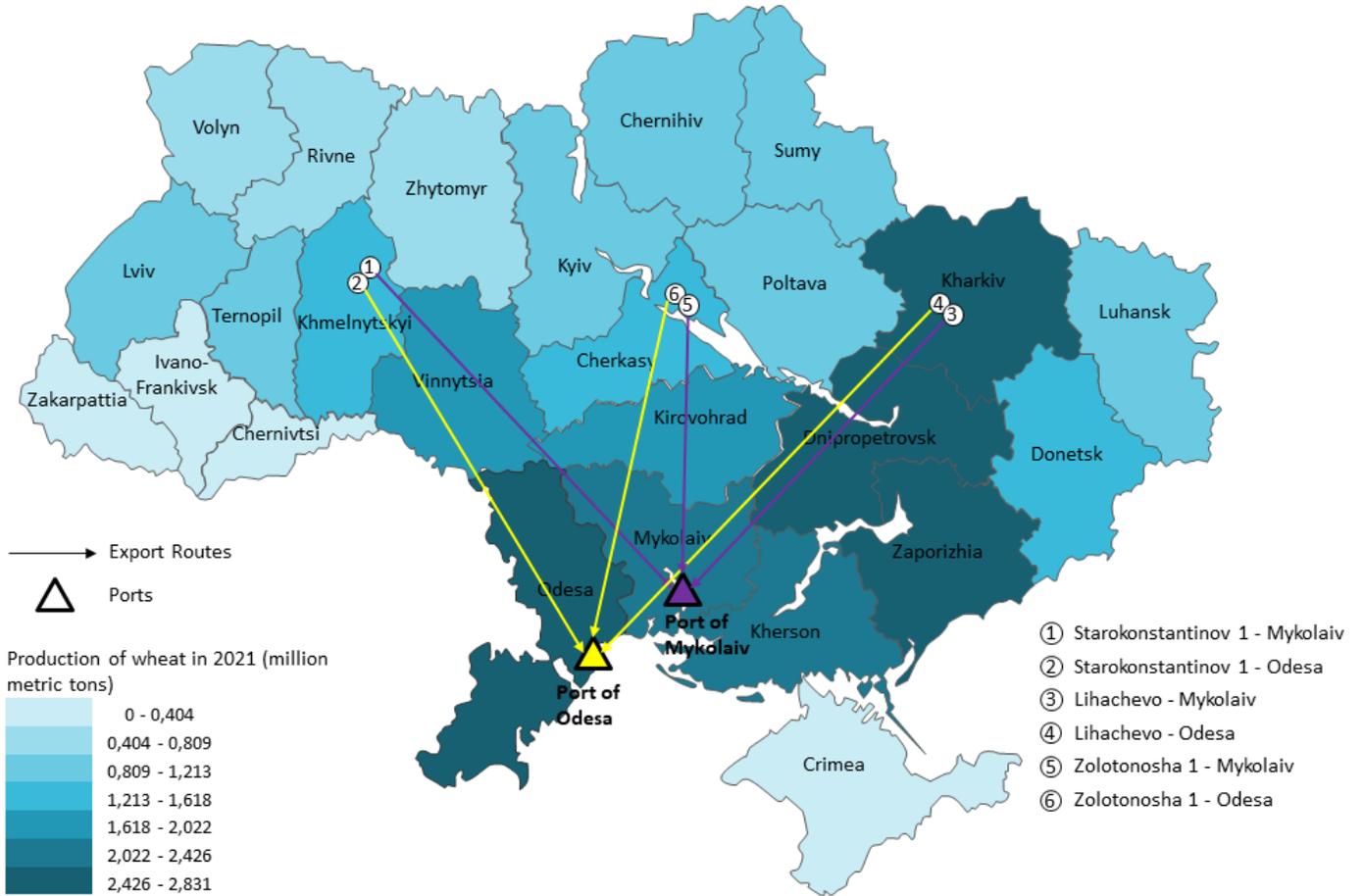
<sup>2</sup>Regions comprised roughly 100 percent of wheat, corn, and soybean production, 2021.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Figure 3. Routes<sup>1</sup> and wheat regions considered in the Ukrainian grain export transportation indicator<sup>2</sup>**



<sup>1</sup>Table 5 on page 14 provides additional information for routes 1-6.

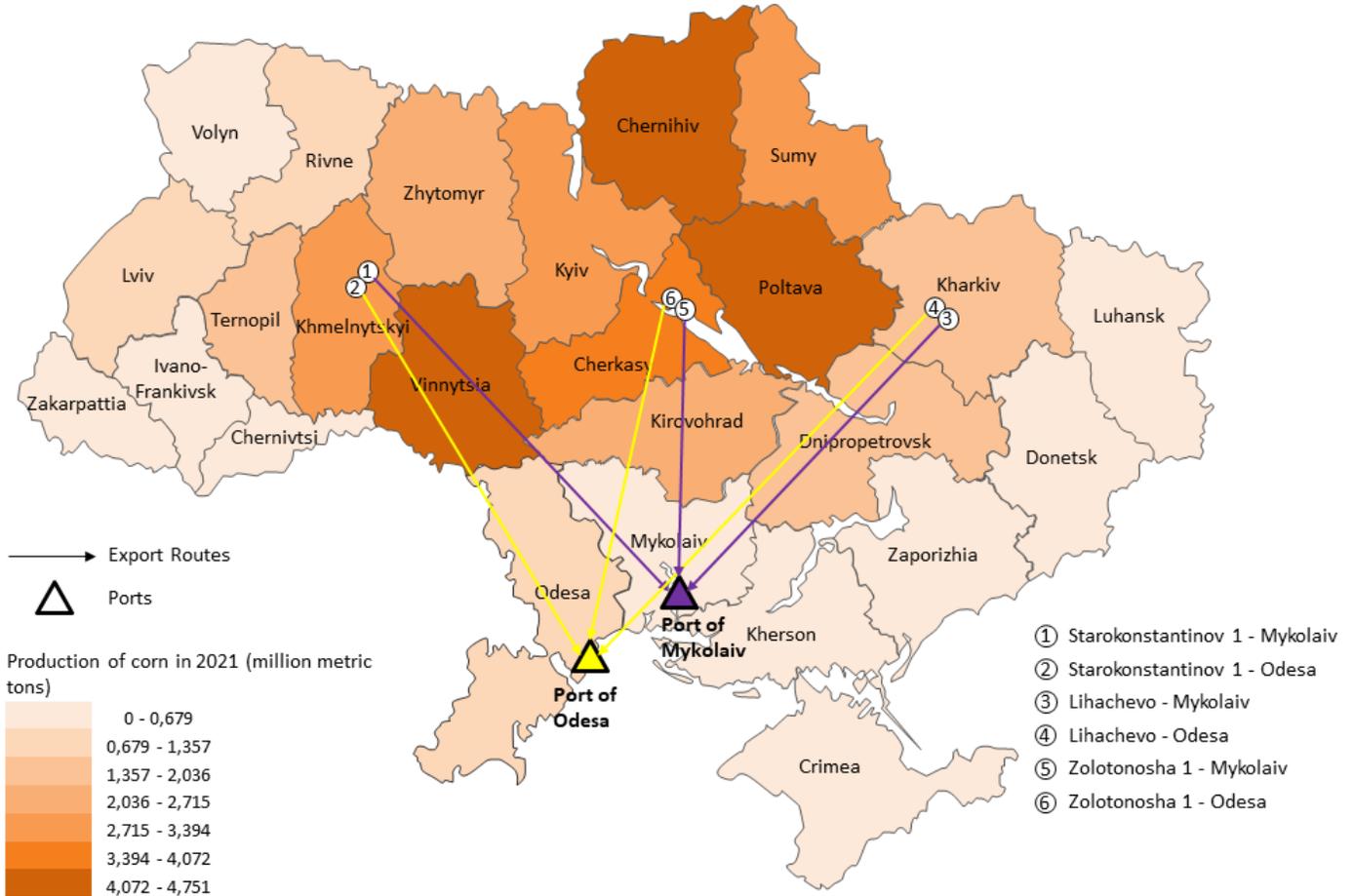
<sup>2</sup>Regions comprised roughly 100 percent of wheat production, 2021.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Figure 4. Routes<sup>1</sup> and corn regions considered in the Ukrainian grain export transportation indicator<sup>2</sup>**



<sup>1</sup>Table 5 on page 14 provides additional information for routes 1-6.

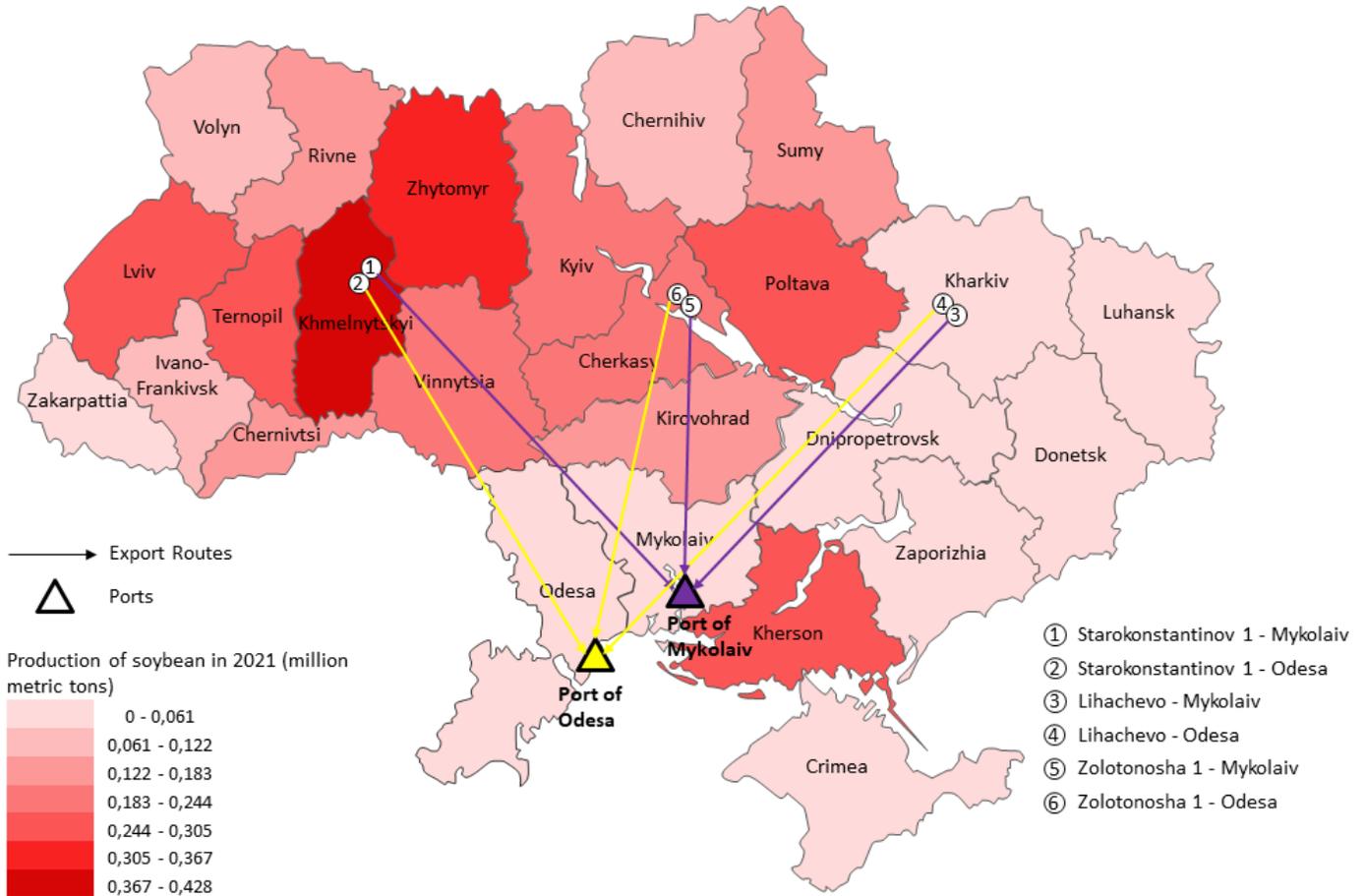
<sup>2</sup>Regions comprised roughly 100 percent of corn production, 2021.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Figure 5. Routes<sup>1</sup> and soybean regions considered in the Ukrainian grain export transportation indicator<sup>2</sup>**



<sup>1</sup>Table 5 on page 14 provides additional information for routes 1-6.

<sup>2</sup>Regions comprised roughly 100 percent of soybean production, 2021.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Table 3. Quarterly costs of transporting Ukrainian wheat from the Black Sea ports to Egypt and Indonesia, 2022**

	To Alexandria, Egypt									
	Central Ukraine <sup>1</sup> - Odesa <sup>2</sup> —US\$/mt—					Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup> —US\$/mt—				
	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022
Truck	8.21	10.23	8.20	8.57	8.80	8.21	10.23	8.20	8.57	8.80
Rail <sup>3</sup>	17.71	19.55	22.54	26.89	21.67	13.28	14.63	16.85	19.72	16.12
Ocean	34.09	--na--	58.93	68.93	53.99	36.98	--na--	--na--	--na--	--na--
Total transportation	60.01	--na--	89.68	104.39	84.69	58.46	--na--	--na--	--na--	--na--
Farm price <sup>4</sup>	294.67	161.57	138.48	158.24	188.24	294.67	161.57	138.48	158.24	188.24
Landed cost	354.68	--na--	228.16	262.63	281.82	353.14	--na--	--na--	--na--	--na--
Transport % of landed cost	16.9	--na--	39.3	39.7	32.0	16.6	--na--	--na--	--na--	--na--
	To Ciwandan/Cigading, Indonesia									
	Central Ukraine <sup>1</sup> - Odesa <sup>2</sup> —US\$/mt—					Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup> —US\$/mt—				
	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022
Truck	8.21	10.23	8.20	8.57	8.80	8.21	10.23	8.20	8.57	8.80
Rail <sup>3</sup>	17.71	19.55	22.54	26.89	21.67	13.28	14.63	16.85	19.72	16.12
Ocean	62.41	--na--	91.27	101.27	84.98	65.30	--na--	--na--	--na--	--na--
Total transportation	88.32	--na--	122.01	136.73	115.69	86.78	--na--	--na--	--na--	--na--
Farm price <sup>4</sup>	294.67	161.57	138.48	158.24	188.24	294.67	161.57	138.48	158.24	188.24
Landed cost	382.99	--na--	260.49	294.97	312.82	381.45	--na--	--na--	--na--	--na--
Transport % of landed cost	23.1	--na--	46.8	46.4	38.8	22.7	--na--	--na--	--na--	--na--

<sup>1</sup>Central Ukraine producing regions are as follows = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

<sup>2</sup>Export ports. The Port of Odesa was closed during the second quarter of 2022. The freight average was calculated based on the first, third, and fourth quarters of 2022. The Port of Mykolaiv has remained closed to navigation since the second quarter of 2022.

<sup>3</sup>Rail rates include the cost of delivery to the railway station and the cost of renting a grain hopper. However, rail rates do not include the cost of moving and positioning rail cars at the elevator and port, railway station fees, security service from loading to discharging port, or freight-forwarding service. (Any or all of these items could exceed the rail tariff rate.) Rail rates are estimated by using specialized software “TM-Karta” in accordance with Ukrainian Railways (Ukrzaliznytsia) tariff regulation.

<sup>4</sup>Farm price = elevator price – handling costs – farm-to-elevator transportation.

Note: qtr = quarter. mt = metric ton. na = not available

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Table 4. Quarterly costs of transporting Ukrainian corn from the Black Sea ports to Egypt and China, 2022**

	To Alexandria, Egypt									
	Central Ukraine <sup>1</sup> - Odesa <sup>2</sup> —US\$/mt—					Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup> —US\$/mt—				
	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022
Truck	8.21	10.23	8.20	8.57	8.80	8.21	10.23	8.20	8.57	8.80
Rail <sup>3</sup>	17.71	19.55	22.54	26.89	21.67	13.28	14.63	16.85	19.72	16.12
Ocean	34.09	--na--	58.93	68.93	53.99	36.98	--na--	--na--	--na--	--na--
Total transportation	60.01	--na--	89.68	104.39	84.69	58.46	--na--	--na--	--na--	--na--
Farm price <sup>4</sup>	260.04	151.38	134.67	140.01	171.53	260.04	151.38	134.67	140.01	171.53
Landed cost	320.05	--na--	224.35	244.40	262.93	318.51	--na--	--na--	--na--	--na--
Transport % of landed cost	18.7	--na--	40.0	42.7	33.8	18.4	--na--	--na--	--na--	--na--
	To Shanghai, China									
	Central Ukraine <sup>1</sup> - Odesa <sup>2</sup> —US\$/mt—					Central Ukraine <sup>1</sup> - Mykolaiv <sup>2</sup> —US\$/mt—				
	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022	1st qtr. 2022	2nd qtr. 2022	3rd qtr. 2022	4th qtr. 2022	Average 2022
Truck	8.21	10.23	8.20	8.57	8.80	8.21	10.23	8.20	8.57	8.80
Rail <sup>3</sup>	17.71	19.55	22.54	26.89	21.67	13.28	14.63	16.85	19.72	16.12
Ocean	57.78	--na--	85.99	95.99	79.92	60.96	--na--	--na--	--na--	--na--
Total transportation	83.70	--na--	116.73	131.45	110.63	82.44	--na--	--na--	--na--	--na--
Farm price <sup>4</sup>	260.04	151.38	134.67	140.01	171.53	260.04	151.38	134.67	140.01	171.53
Landed cost	343.74	--na--	251.40	271.46	288.87	342.49	--na--	--na--	--na--	--na--
Transport % of landed cost	24.3	--na--	46.4	48.4	39.7	24.1	--na--	--na--	--na--	--na--

<sup>1</sup>Central Ukraine producing regions are as follows = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

<sup>2</sup>Export ports. The Port of Odesa was closed during the second quarter of 2022. The freight average was calculated based on the first, third, and fourth quarters of 2022. The Port of Mykolaiv has remained closed to navigation since the second quarter of 2022.

<sup>3</sup>Rail rates include the cost of delivery to the railway station and the cost of renting a grain hopper. However, rail rates do not include the cost of moving and positioning rail cars at the elevator and port, railway station fees, security service from loading to discharging port, or freight-forwarding service. (Any or all of these items could exceed the rail tariff rate.) Rail rates are estimated by using specialized software “TM-Karta” in accordance with Ukrainian Railways (Ukrzaliznytsia) tariff regulation.

<sup>4</sup>Farm price = elevator price – handling costs – farm-to-elevator transportation.

Note: qtr = quarter. mt = metric ton. na = not available.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Table 5. Quarterly rail rates for selected Ukrainian grain and soybean export transportation routes, 2022**

Route #	Origin (reference city) <sup>1</sup>	Destination	Distance (miles)	Share (%) <sup>2</sup>	Freight price (US\$/mt/100 miles) <sup>3</sup>				
					1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
1	Western Ukraine (Khmelnitskii, station Starokonstantinov 1)	Mykolaiv	501	29.7	5.00	5.58	6.20	7.67	6.11
2	Western Ukraine (Khmelnitskii, station Starokonstantinov 1)	Odesa	343		5.17	5.70	6.54	7.84	6.31
3	Eastern Ukraine (Kharkiv, station Lihachevo)	Mykolaiv	340	18.8	5.21	5.75	6.63	7.91	6.38
4	Eastern Ukraine (Kharkiv, station Lihachevo)	Odesa	521		4.88	5.36	6.11	7.51	5.96
5	Central Ukraine (Cherkasy, station Zolotonosha 1)	Mykolaiv	240	51.5	5.54	6.10	7.03	8.22	6.72
6	Central Ukraine (Cherkasy, station Zolotonosha 1)	Odesa	341		5.19	5.73	6.61	7.88	6.35

<sup>1</sup>Although each origin region comprises several cities, the major station at the center of each region is considered as a reference to establish the freight price. Western Ukraine producing regions are as follows = Chernivtsi, Ivano-Frankivsk, Khmel'nitskii, Lviv, Rivne, Ternopil, Vinnytsia, Volyn, Zakarpattia, and Zhytomyr provinces. Eastern Ukraine producing regions are as follows = Dnipropetrovsk, Donetsk, Kharkiv, Luhansk, and Zaporizhia provinces. Central Ukraine producing regions are as follows = Cherkasy, Chernihiv, Kherson, Kirovohrad, Kyiv, Mykolaiv, Odesa, Poltava, and Sumy provinces.

<sup>2</sup>Share is measured as a percentage of total production and illustrates the production in the region.

<sup>3</sup>Rail rates include the cost of delivery to the railway station and the cost of renting a grain hopper. However, rail rates do not include the cost of moving and positioning rail cars at the elevator and port, railway station fees, security service from loading to discharging port, or freight-forwarding service. (Any or all of these items could exceed the rail tariff rate.) Rail rates are estimated by using specialized software "TM-Karta" in accordance with Ukrainian Railways (Ukrzaliznytsia) tariff regulation.

Average monthly exchange rate from the National Bank of Ukraine was used to convert Ukrainian Hryvnia to U.S. dollars.

Note: qtr = quarter. mt = metric ton. Avg = average.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Table 6. Monthly Ukrainian grain and oilseeds export truck transportation cost index**

Month	Freight price (US\$/mt/100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)	Month	Freight price (US\$/mt/100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)
Jan-19	18.65	0.0	100.00	Jan-21	6.22	-28.5	33.35
Feb-19	19.15	2.6	102.65	Feb-21	6.99	12.4	37.48
Mar-19	16.75	-12.5	89.81	Mar-21	9.90	41.6	53.08
Apr-19	14.92	-10.9	79.99	Apr-21	8.70	-12.1	46.64
May-19	15.16	1.6	81.30	May-21	7.41	-14.8	39.73
Jun-19	15.09	-0.5	80.93	Jun-21	11.47	54.8	61.50
Jul-19	15.53	2.9	83.28	Jul-21	13.84	20.7	74.22
Aug-19	15.84	2.0	84.94	Aug-21	14.91	7.7	79.92
Sep-19	16.15	1.9	86.58	Sep-21	18.67	25.3	100.12
Oct-19	16.12	-0.2	86.45	Oct-21	20.94	12.1	112.26
Nov-19	18.47	14.5	99.01	Nov-21	22.83	9.0	122.40
Dec-19	17.80	-3.6	95.42	Dec-21	16.87	-26.1	90.44
Jan-20	17.41	-2.2	93.36	Jan-22	14.96	-11.3	80.21
Feb-20	15.94	-8.5	85.45	Feb-22	16.15	7.9	86.58
Mar-20	16.43	3.1	88.10	Mar-22	17.17	6.3	92.06
Apr-20	13.58	-17.4	72.79	Apr-22	17.94	4.5	96.19
May-20	13.57	0.0	72.78	May-22	18.38	2.5	98.55
Jun-20	13.31	-1.9	71.39	Jun-22	19.15	4.2	102.68
Jul-20	10.74	-19.3	57.58	Jul-22	16.93	-11.6	90.79
Aug-20	7.63	-29.0	40.91	Aug-22	17.61	4.0	94.42
Sep-20	9.87	29.4	52.92	Sep-22	19.46	10.5	104.33
Oct-20	7.77	-21.3	41.66	Oct-22	19.81	1.8	106.22
Nov-20	8.14	4.8	43.64	Nov-22	20.16	1.8	108.11
Dec-20	8.70	6.9	46.64	Dec-22	20.84	3.4	111.73

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

**Table 7. Quarterly ocean freight rates for shipping grain and soybeans from selected Ukrainian ports (US\$/metric ton)**

Cargo	Port	Destination	1st qtr 2020	2nd qtr 2020	3rd qtr 2020	4th qtr 2020
Wheat	Mykolaiv	Alexandria, Egypt <sup>1</sup>	13.08	10.58	15.00	16.17
Wheat	Mykolaiv	Ciwandan/Cigading, Indonesia <sup>2</sup>	32.42	25.25	34.75	33.58
Wheat	Odesa	Alexandria, Egypt <sup>1</sup>	11.33	8.83	13.08	14.42
Wheat	Odesa	Ciwandan/Cigading, Indonesia <sup>2</sup>	30.67	23.50	32.83	31.83
Corn	Mykolaiv	Alexandria, Egypt <sup>1</sup>	13.08	10.58	15.00	16.17
Corn	Mykolaiv	Southern ports, China <sup>2</sup>	31.92	27.58	34.25	34.25
Corn	Odesa	Alexandria, Egypt <sup>1</sup>	11.33	8.83	13.08	14.42
Corn	Odesa	Southern ports, China <sup>3</sup>	29.17	24.83	31.50	31.50
Soybeans	Mykolaiv	Southern ports, China <sup>3</sup>	30.92	26.58	33.25	33.25
Soybeans	Odesa	Southern ports, China <sup>3</sup>	29.17	24.83	31.50	31.50
Cargo	Port	Destination	1st qtr 2021	2nd qtr 2021	3rd qtr 2021	4th qtr 2021
Wheat	Mykolaiv	Alexandria, Egypt <sup>1</sup>	21.67	24.17	35.00	33.67
Wheat	Mykolaiv	Ciwandan/Cigading, Indonesia <sup>2</sup>	45.50	51.00	72.83	61.33
Wheat	Odesa	Alexandria, Egypt <sup>1</sup>	19.50	21.50	31.50	31.00
Wheat	Odesa	Ciwandan/Cigading, Indonesia <sup>2</sup>	43.33	48.33	69.33	58.67
Corn	Mykolaiv	Alexandria, Egypt <sup>1</sup>	21.67	24.17	35.00	33.67
Corn	Mykolaiv	Southern ports, China <sup>2</sup>	42.25	49.42	66.42	56.75
Corn	Odesa	Alexandria, Egypt <sup>1</sup>	19.50	21.50	31.50	31.00
Corn	Odesa	Southern ports, China <sup>3</sup>	39.50	46.67	63.67	54.00
Soybeans	Mykolaiv	Southern ports, China <sup>3</sup>	41.25	48.42	65.42	55.75
Soybeans	Odesa	Southern ports, China <sup>3</sup>	39.50	46.67	63.67	54.00
Cargo	Port	Destination	1st qtr 2022	2nd qtr 2022	3rd qtr 2022	4th qtr 2022
Wheat	Mykolaiv	Alexandria, Egypt <sup>1</sup>	36.98	--na--	--na--	--na--
Wheat	Mykolaiv	Ciwandan/Cigading, Indonesia <sup>2</sup>	65.30	--na--	--na--	--na--
Wheat	Odesa	Alexandria, Egypt <sup>1</sup>	34.09	--na--	58.93	68.93
Wheat	Odesa	Ciwandan/Cigading, Indonesia <sup>2</sup>	62.41	--na--	91.27	101.27
Corn	Mykolaiv	Alexandria, Egypt <sup>1</sup>	36.98	--na--	--na--	--na--
Corn	Mykolaiv	Southern ports, China <sup>2</sup>	60.96	--na--	--na--	--na--
Corn	Odesa	Alexandria, Egypt <sup>1</sup>	34.09	--na--	58.93	68.93
Corn	Odesa	Southern ports, China <sup>3</sup>	57.78	--na--	85.99	95.99
Soybeans	Mykolaiv	Southern ports, China <sup>3</sup>	59.81	--na--	--na--	--na--
Soybeans	Odesa	Southern ports, China <sup>3</sup>	57.78	--na--	85.99	95.99

<sup>1</sup>Vessel size = 25,000-30,000 metric ton.

<sup>2</sup>Vessel size = 50,000-55,000 metric ton.

<sup>3</sup>Vessel size = 60,000-70,000 metric ton.

Note: China's main southern ports include Shanghai, Ningbo, Shenzhen, and Guangdong. na = not available.

The Port of Odesa was closed during the second quarter of 2022. The freight average was calculated based on the first, third, and fourth quarters of 2022. The Port of Mykolaiv has remained closed to navigation since the second quarter of 2022.

Source: Centre for Transport Strategies (CFTS) Kyiv, Ukraine, and USDA, Agricultural Marketing Service.



# Ukraine Grain Transportation

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## Data Sets (XLS files):

- [Figure 1a. Ukrainian wheat, corn and soybeans export truck cost index, 2021-22](#)
- [Table 1a. Tonnages and modal shares for Ukrainian grain and oilseed exports through Ukrainian seaports, 2018-22](#)
- [Table 2a. Average costs of transporting Ukrainian wheat from the Black Sea ports to Egypt and Indonesia, 2021-22](#)
- [Table 2b. Average costs of transporting Ukrainian corn from the Black Sea ports to Egypt and China, 2021-22](#)
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