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Brazil Soybean Transportation

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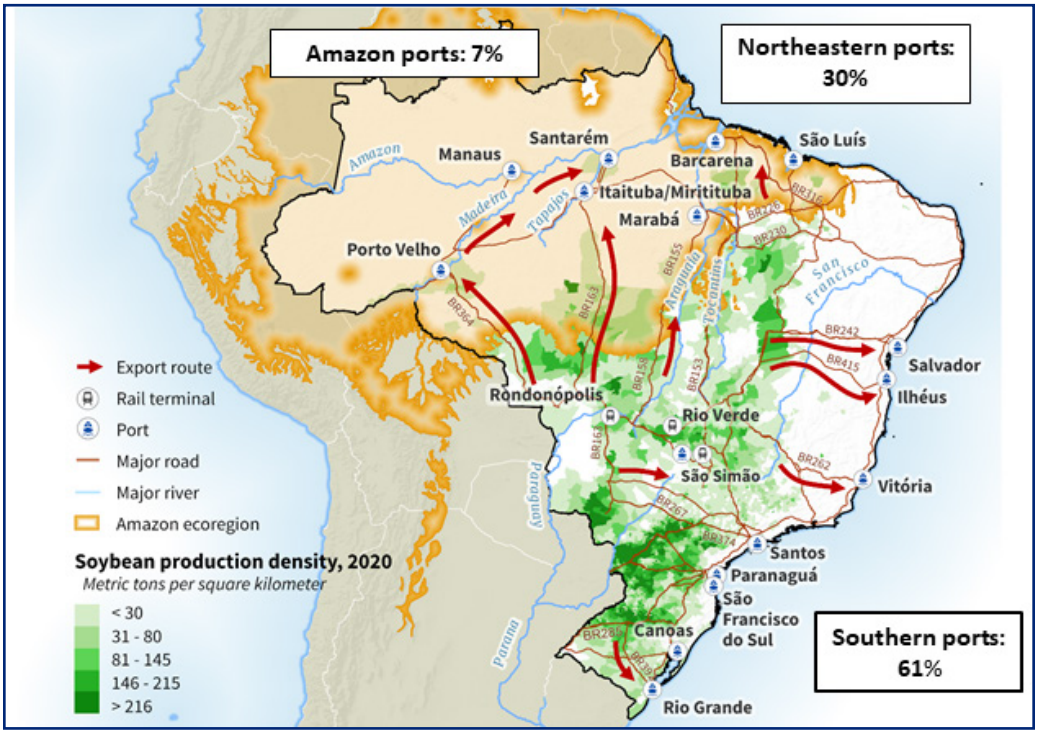
New Center-West Rail and Truck Brazilian Soybean Export Route

The Agricultural Marketing Service (AMS) and the ESALQ-LOG Group expanded the scope of the AMS quarterly *Brazilian Soybean Transportation* indicator report to better reflect Brazil's transportation agricultural infrastructure improvements, which enhance the country's competitiveness in the world market. These changes replace and add routes through the southern Port of Santos and the northeastern Port of São Luís to Shanghai, China, and Hamburg, Germany (figures 1, 2, 4 and tables 1, 3, 7, and 9).

Specifically, the changes are as follows. Route #15 by truck, from Canarana, Northeast Mato Grosso, to the Port of São Luís replaces the route from Assis Chateaubriand, West Paraná, to the Port of Santos. In 2021, São Luís accounted for 7.2 percent of Mato Grosso soybean exports (Comex Stat, Ministério da Economia).[1] Route #38, an intermodal truck-rail export route, from Rio Verde, South Goiás, to the Port of Santos is newly added. The Rio Verde rail terminal is operated by Rumo Logistics' new rail network called "Malha Central." This is part of the North-South Railroad that started operations in June 2021 and handled around 1.2 million metric tons (mmt) of grain that year (Agência Nacional de Transportes Terrestres 2022). In Brazil, there are no published rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (ESALQ-LOG).

The indicator report includes 22 regions in 11 States, representing 81 percent of the total 2020 Brazilian soybean production (figures

Figure 1. Southern ports exported 61 percent of Brazilian soybeans, January-March 2022



1 In this report, the source of Brazil export data is the Comex Stat, Ministério da Economia.

World Wildlife Fund.
Brazilian Institute of Geography and Statistics - Produção Agricola Municipal.
Source: USDA/Agricultural Marketing Service (AMS) and USDA/Foreign Agricultural Service (FAS).

1 and 3). The revamped Brazilian Soybean Transportation indicator report now includes 38 export routes through the Ports of Santos, Paranaguá, Rio Grande, Santarém, São Luís, and Barcarena to Shanghai, China, and Hamburg, Germany. Truck freight rates correspond to actual values negotiated between shippers and carriers, including tolls, but excluding insurance and taxes.

The ocean freight rates from the "Sistema de Informações de Fretes, SIFRECA, ESALQ – USP" correspond to actual values negotiated between shippers and carriers, but do not include insurance and handling costs. These rates are averaged according to the weights of the shipped volumes.

From first quarter 2021 to first quarter 2022 (year to year), Brazilian soybean exports increased from 15.4 mmt to 21 mmt. Year to year, the cost of shipping a metric ton (mt) of soybeans 100 miles by truck rose nearly 33 percent from $5.60 per mt to $7.43 per mt (table 8). This increase also partially reflects the nearly 5-percent appreciation of the Brazilian real (R$) against the U.S. dollar and higher fuel prices. Brazil's domestic average diesel prices increased 46 percent compared to the same period in 2021. The Brazilian real appreciated against the U.S. dollar, from R$5.48 per U.S. dollar to R$5.22 per U.S. dollar (Brazil Central Bank). In the State of Mato Grosso, higher transportation costs and farm gate prices led to higher costs for transporting Brazilian soybeans from the southern ports to Shanghai and Hamburg. As a share of total landed costs, transportation costs from northern Mato Grosso to Santos, Paranaguá, and Rio Grande increased 15-21 percent (tables 1 and 2).

Year to year, average Brazilian soybean export prices rose by 31 percent, from $393.16 per mt to $513.27 per mt. Despite this year's appreciation of the real, Brazilian farmers are still benefitting from the real's relative weakness against the U.S. dollar. This is because soybeans are priced in U.S. dollars but paid in reais. Measured in U.S. dollars, soybean average farm gate prices increased 20 percent, from $473.15/mt to $569.06/mt year to year. On average, in reais, first-quarter 2022 farm gate prices increased 14 percent, from R$2,589.04/mt to R$2,958.15/mt (CONAB).

In first quarter 2022, Brazil exported 14.8 mmt of soybeans to China, 34 percent more than the first quarter 2021 total of nearly 11 mmt. The next highest shares of Brazil's soybean exports (in declining order) went to Spain, the Netherlands, Thailand, and Turkey. The southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul still dominate the soybean trade to China, accounting for 73 percent of Brazil's soybean exports to China. Also, in the first 3 months of 2022, the northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for 26 percent of soybean exports to China. The Amazon River port of Manaus exported a small amount to China. For more information, contact Delmy L. Salin at delmy.salin@usda.gov.

Brazil Soybean Transportation

Table 1. Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China

	North MT[1] - Santos[2] by truck			Northwest RS[1] - Rio Grande[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	60.94	83.64	37.2	19.91	27.55	38.3
Ocean	37.00	62.00	67.6	37.25	62.75	68.5
Total transportation	97.94	145.64	48.7	57.16	90.30	58.0
Farm gate price[3]	463.10	550.71	18.9	475.64	604.37	27.1
Landed cost	561.04	696.34	24.1	532.80	694.66	30.4
Transport % of landed cost	17.5	20.9	19.8	10.7	13.0	21.2
	North MT[1] - Santos[2] by rail			North MT[1] - Paranaguá[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	22.18	27.91	25.8	58.57	82.88	41.5
Rail[4]	30.95	37.69	21.8	-	-	-
Ocean	37.00	62.00	67.6	38.75	64.00	65.2
Total transportation	90.13	127.60	41.6	97.32	146.88	50.9
Farm gate price[3]	463.10	550.71	18.9	463.10	550.71	18.9
Landed cost	553.22	678.31	22.6	560.42	697.58	24.5
Transport % of landed cost	16.3	18.8	15.5	17.4	21.1	21.2

[1]Producing regions: RS = Rio Grande do Sul and MT= Mato Grosso.

[2]Export port.

[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).

[4]In Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers.

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

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 1a. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China

	North MT[1] - Santarém[2]			South MA[1] - São Luís[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	40.01	53.57	33.9	25.06	38.28	52.8
Ocean	40.54	66.00	62.8	41.00	66.20	61.5
Total transportation	80.55	119.57	48.4	66.06	104.48	58.2
Farm gate price[3]	463.10	550.71	18.9	466.73	558.85	19.7
Landed cost	543.64	670.27	23.3	532.79	663.33	24.5
Transport % of landed cost	14.8	17.8	20.4	12.4	15.8	27.0
	Southwest PI[1] - São Luís[2]			North MT[1] - Barcarena[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	29.27	38.32	30.9	34.86	46.94	34.6
Barge[4]	-	-	-	16.37	20.01	22.2
Ocean	41.00	66.20	61.5	42.00	68.00	61.9
Total transportation	70.27	104.52	48.7	93.23	134.95	44.7
Farm gate price[3]	484.07	543.56	12.3	463.10	550.71	18.9
Landed cost	554.34	648.08	16.9	556.33	685.66	23.2
Transport % of landed cost	12.7	16.1	27.2	16.8	19.7	17.4

[1]Producing regions: MT= Mato Grosso, PI = Piauí, and MA = Maranhão.
[2]Export port.
[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).
[4]In Brazil, there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 2. Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany

	North MT[1] - Santos[2]			Northwest RS[1] - Rio Grande[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	60.94	83.64	37.2	19.91	27.55	38.3
Ocean	31.25	52.70	68.6	32.00	54.00	68.8
Total transportation	92.19	136.34	47.9	51.91	81.55	57.1
Farm gate price[3]	463.10	550.71	18.9	475.64	604.37	27.1
Landed cost	555.29	687.04	23.7	527.55	685.91	30.0
Transport % of landed cost	16.6	19.8	19.5	9.8	11.9	20.8
	North MT[1] - Santos[2] by rail			North MT[1] - Paranaguá[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	22.18	27.91	25.8	58.57	82.88	41.5
Rail[4]	30.95	37.69	21.8	-	-	-
Ocean	31.25	52.70	68.6	31.00	51.50	66.1
Total transportation	84.38	118.30	40.2	89.57	134.38	50.0
Farm gate price[3]	463.10	550.71	18.9	463.10	550.71	18.9
Landed cost	547.47	669.01	22.2	552.67	685.08	24.0
Transport % of landed cost	15.4	17.7	14.7	16.2	19.6	21.0

[1]Producing regions: RS = Rio Grande do Sul and MT= Mato Grosso.

[2]Export port.

[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).

[4]In Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers.

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

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

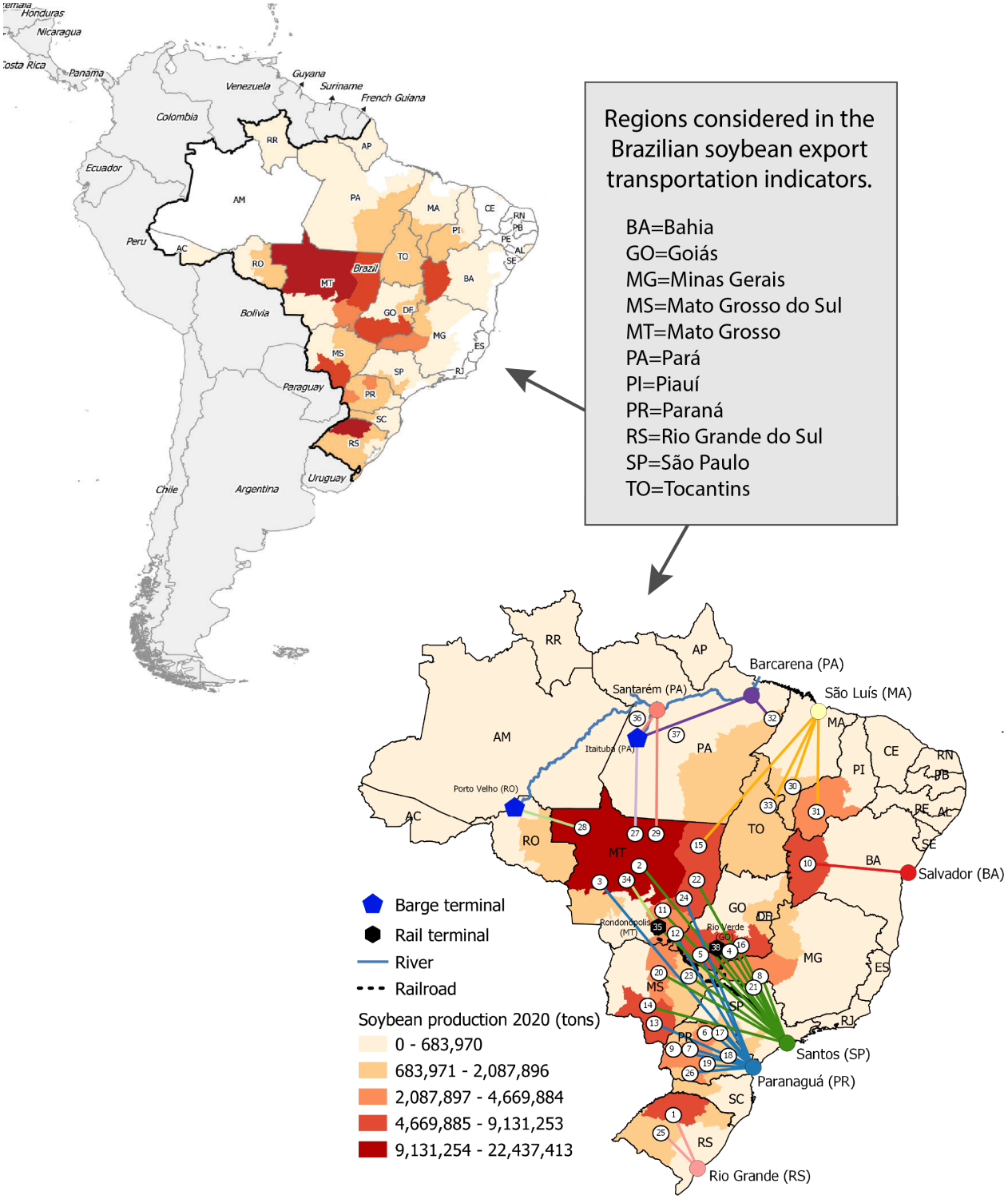
Brazil Soybean Transportation

Table 2a. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany

	North MT[1] - Santarém[2]			South MA[1] - São Luís[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	40.01	53.57	33.9	25.06	38.28	52.8
Ocean	28.65	49.10	71.4	33.25	56.50	69.9
Total transportation	68.66	102.67	49.5	58.31	94.78	62.6
Farm gate price[3]	463.10	550.71	18.9	466.73	558.85	19.7
Landed cost	531.75	653.37	22.9	525.04	653.63	24.5
Transport % of landed cost	12.9	15.7	21.7	11.1	14.5	30.6
	Southwest PI[1] - São Luís[2]			North MT[1] - Barcarena[2]		
	—US$/mt—		% Change	—US$/mt—		% Change
	2021 1st qtr.	2022 1st qtr.	2021-22	2021 1st qtr.	2022 1st qtr.	2021-22
Truck	29.27	38.32	30.9	34.86	46.94	34.6
Barge[4]	-	-	-	16.37	20.01	22.2
Ocean	33.25	56.50	69.9	28.10	48.00	70.8
Total transportation	62.52	94.82	51.7	79.33	114.95	44.9
Farm gate price[3]	484.07	543.56	12.3	463.10	550.71	18.9
Landed cost	546.59	638.38	16.8	542.43	665.66	22.7
Transport % of landed cost	11.4	14.9	29.9	14.6	17.3	18.1

[1]Producing regions: MT= Mato Grosso, PI = Piauí, and MA = Maranhão.
[2]Export port.
[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).
[4]In Brazil, there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Figure 2. Routes[1] and regions considered in the Brazilian soybean export transportation indicator[2]



[1]Table defining routes by number is shown on page 12.

[2]Regions comprised about 79 percent of Brazilian soybean production, 2020 (Brazilian Institute of Geography and Statistics—Produção Agricola Municipal).

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 3. Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China, 2022

	North MT[1] - Santos[2] by truck —US$/mt—					North MT[1] - Paranaguá[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	83.64				83.64	82.88				82.88
Ocean	62.00				62.00	64.00				64.00
Total transportation	145.64				145.64	146.88				146.88
Farm gate price[3]	550.71				550.71	550.71				550.71
Landed cost	696.34				696.34	697.58				697.58
Transport % of landed cost	20.9				20.91	21.1				21.06
	North MT[1] - Santos[2] by rail —US$/mt—					**Northwest RS[1] - Rio Grande[2] —US$/mt—**				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	27.91				27.91	27.55				27.55
Rail[4]	37.69				37.69	-				-
Ocean	62.00				62.00	62.75				62.75
Total transportation	127.60				127.60	90.30				90.30
Farm gate price[3]	550.71				550.71	604.37				604.37
Landed cost	678.31				678.31	694.66				694.66
Transport % of landed cost	18.8				18.81	13.0				13.00

[1]Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, and PR = Paraná.

[2]Export port.

[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).

[4] In, Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers.

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

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 4. Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany, 2022

	North MT[1] - Santos[2] by truck —US$/mt—					North MT[1] - Paranaguá[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	83.64				83.64	82.88				82.88
Ocean	52.70				52.70	51.50				51.50
Total transportation	136.34				136.34	134.38				134.38
Farm gate price[3]	550.71				550.71	550.71				550.71
Landed cost	687.04				687.04	685.08				685.08
Transport % of landed cost	19.8				19.8	19.6				19.6
	North MT[1] - Santos[2] by rail —US$/mt—					Northwest RS[1] - Rio Grande[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	27.91				27.91	27.55				27.55
Rail[4]	37.69				37.69	-				-
Ocean	52.70				52.70	54.00				54.00
Total transportation	118.30				118.30	81.55				81.55
Farm gate price[3]	550.71				550.71	604.37				604.37
Landed cost	669.01				669.01	685.91				685.91
Transport % of landed cost	17.7				17.7	11.9				11.9

[1]Producing regions: RS = Rio Grande do Sul and MT= Mato Grosso.
[2]Export port.
[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).
[4]In, Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers.
Note: qtr. = quarter. mt = metric ton. Avg. = average.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 5. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China, 2022

	North MT[1] - Santarém[2] —US$/mt—					South MA[1] - São Luís[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	53.57				53.57	38.28				38.28
Ocean	66.00				66.00	66.20				66.20
Total transportation	119.57				119.57	104.48				104.48
Farm gate price[3]	550.71				550.71	558.85				558.85
Landed cost	670.27				670.27	663.33				663.33
Transport % of landed cost	17.8				17.8	15.8				15.8
	Southwest PI[1] - São Luís[2] —US$/mt—					North MT[1] - Barcarena[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	38.32				38.32	46.94				46.94
Barge[4]	-				-	20.01				20.01
Ocean	66.20				66.20	68.00				68.00
Total transportation	104.52				104.52	134.95				134.95
Farm gate price[3]	543.56				543.56	550.71				550.71
Landed cost	648.08				648.08	685.66				685.66
Transport % of landed cost	16.1				16.1	19.7				19.7

[1]Producing regions: MT= Mato Grosso, PI = Piauí, and MA = Maranhão.
[2]Export port.
[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).
[4]In Brazil, there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton. Avg. = average.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 6. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany, 2022

	North MT[1] - Santarém[2] —US$/mt—					South MA[1] - São Luís[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	53.57				53.57	38.28				38.28
Ocean	49.10				49.10	56.50				56.50
Total transportation	102.67				102.67	94.78				94.78
Farm gate price[3]	550.71				550.71	558.85				558.85
Landed cost	653.37				653.37	653.63				653.63
Transport % of landed cost	15.7				15.7	14.5				14.5
	Southwest PI[1] - São Luís[2] —US$/mt—					North MT[1] - Barcarena[2] —US$/mt—				
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
Truck	38.32				38.32	46.94				46.94
Barge[4]	-				-	20.01				20.01
Ocean	56.50				56.50	48.00				48.00
Total transportation	94.82				94.82	114.95				114.95
Farm gate price[3]	543.56				543.56	550.71				550.71
Landed cost	638.38				638.38	665.66				665.66
Transport % of landed cost	14.9				14.9	17.3				17.3

[1]Producing regions: MT= Mato Grosso, PI = Piauí, and MA = Maranhão.
[2]Export port.
[3]The source of the farm gate price is the Brazilian Government, Companhia Nacional de Abastecimento (CONAB).
[4]In Brazil,there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton. Avg. = average.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Brazil Soybean Transportation

Table 7. Quarterly truck rates for selected Brazilian soybean export transportation routes, 2022

Route #	Origin[1] (reference city)	Destination	Distance (miles)[2]	Share (%)[3]	Freight price (US$/mt/100 miles)[4]				
					1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
1	Northwest RS[5] (Cruz Alta)	Rio Grande	288	6.7	9.56				9.56
2	North MT (Sorriso)	Santos	1,190	3.3	7.03				7.03
3	North MT (Sorriso)	Paranaguá	1,262	3.1	6.57				6.57
4	South GO (Rio Verde)	Santos	587	5.1	6.65				6.65
5	South GO (Rio Verde)	Paranaguá	726	4.1	6.79				6.79
6	North Central PR (Londrina)	Paranaguá	268	3.4	9.14				9.14
7	Western Central PR (Mamborê)	Paranaguá	311	2.5	8.46				8.46
8	Triangle MG (Uberaba)	Santos	339	3.3	9.03				9.03
9	West PR (Assis Chateaubriand)	Paranaguá	377	4.1	7.91				7.91
10	West Extreme BA (São Desidério)	Salvador	535	6.1	7.25				7.25
11	Southeast MT (Primavera do Leste)	Santos	901	2.5	6.30				6.30
12	Southeast MT (Primavera do Leste)	Paranaguá	975	2.3	6.08				6.08
13	Southwest MS (Maracaju)	Paranaguá	612	3.6	6.99				6.99
14	Southwest MS (Maracaju)	Santos	652	3.4	6.97				6.97
15	Northeast MT (Canarana)	São Luís	1,177	2.0	7.23				7.23
16	East GO (Cristalina)	Santos	585	2.1	7.71				7.71
17	North PR (Cornélio Procópio)	Paranaguá	306	1.8	7.46				7.46
18	Eastern Central PR (Castro)	Paranaguá	130	2.1	11.07				11.07
19	South Central PR (Guarapuava)	Paranaguá	204	2.5	10.42				10.42
20	North Central MS (São Gabriel do Oeste)	Santos	720	2.6	6.11				6.11
21	Ribeirão Preto SP (Guairá)	Santos	314	0.5	7.41				7.41
22	Northeast MT (Canarana)	Santos	950	2.5	6.47				6.47
23	East MS (Chapadão do Sul)	Santos	607	1.3	6.15				6.15

[1]Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available.
[2]Distance from the main city of the considered region to the mentioned ports.
[3]Share is measured as a percentage of total production.
[4]Average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollars.
[5]RS=Rio Grande do Sul, MT=Mato Grosso, GO=Goiás, PR=Paraná, MG=Minas Gerais, BA=Bahia, MS=Mato Grosso do Sul, SP=São Paulo, PI=Piauí, MA=Maranhão, PA=Pará, and TO=Tocantins.
[6]In Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on the volumes hauled and the terms of contracts signed between the railroad company and shippers.
[7]In Brazil, there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on the volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton. Avg. = average.
For more details, on the definitions/calculations contact esalqlog@esalqlog.esalq.usp.br.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

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Route #	Origin[1] (reference city)	Destination	Distance (miles)[2]	Share (%)[3]	Freight price (US$/mt/100 miles)[4]				
					1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	Avg.
24	Northeast MT (Canarana)	Paranaguá	1,075	2.2	6.42				6.42
25	Western Central RS (Tupanciretã)	Rio Grande	273	1.4	8.51				8.51
26	Southwest PR(Chopinzinho)	Paranaguá	291	1.8	7.70				7.70
27	North MT (Sorriso)	Itaituba	672	5.8	6.99				6.99
28	North MT (Sorriso)	Porto Velho	632	6.1	6.43				6.43
29	North MT (Sorriso)	Santarém	876	4.4	6.11				6.11
30	South MA (Balsas)	São Luís	482	2.1	7.95				7.95
31	Southwest PI (Bom Jesus)	São Luís	606	2.4	6.33				6.33
32	Southeast PA (Paragominas)	Barcarena	249	1.6	8.42				8.42
33	East TO (Campos Lindos)	São Luís	842	1.4	6.05				6.05
	Weighted average		**587**	**100.0**	**7.43**				**7.43**
34	North MT (Sorriso)	Rondonópolis (**Rail terminal**)	382		7.31				7.31
35	Rondonópolis MT (**Rail terminal**)[6]	Santos	1,019		3.70				3.70
36	Itaituba PA **(Barge terminal)**[7]	Santarém	224		4.95				4.95
37	Itaituba PA **(Barge terminal)**[7]	Barcarena	738		2.71				2.71
38	South GO (Rio Verde)	São Luís	546		4.97				4.97

[1]Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available.
[2]Distance from the main city of the considered region to the mentioned ports.
[3]Share is measured as a percentage of total production.
[4]Average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollars.
[5]RS=Rio Grande do Sul, MT=Mato Grosso, GO=Goiás, PR=Paraná, MG=Minas Gerais, BA=Bahia, MS=Mato Grosso do Sul, SP=São Paulo, PI=Piauí, MA=Maranhão, PA=Pará, and TO=Tocantins.
[6]In Brazil, there are no published rail tariff rates. Rail rates can be up to 30 percent lower than truck rates, depending on the volumes hauled and the terms of contracts signed between the railroad company and shippers.
[7]In Brazil, there are no published barge rates. Barge rates can be up to 60 percent lower than truck rates, depending on the volumes hauled and the terms of contracts signed between the barge company and shippers. The distance is in nautical miles.
Note: qtr. = quarter. mt = metric ton. Avg. = average.
For more details, on the definitions/calculations contact esalqlog@esalqlog.esalq.usp.br.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

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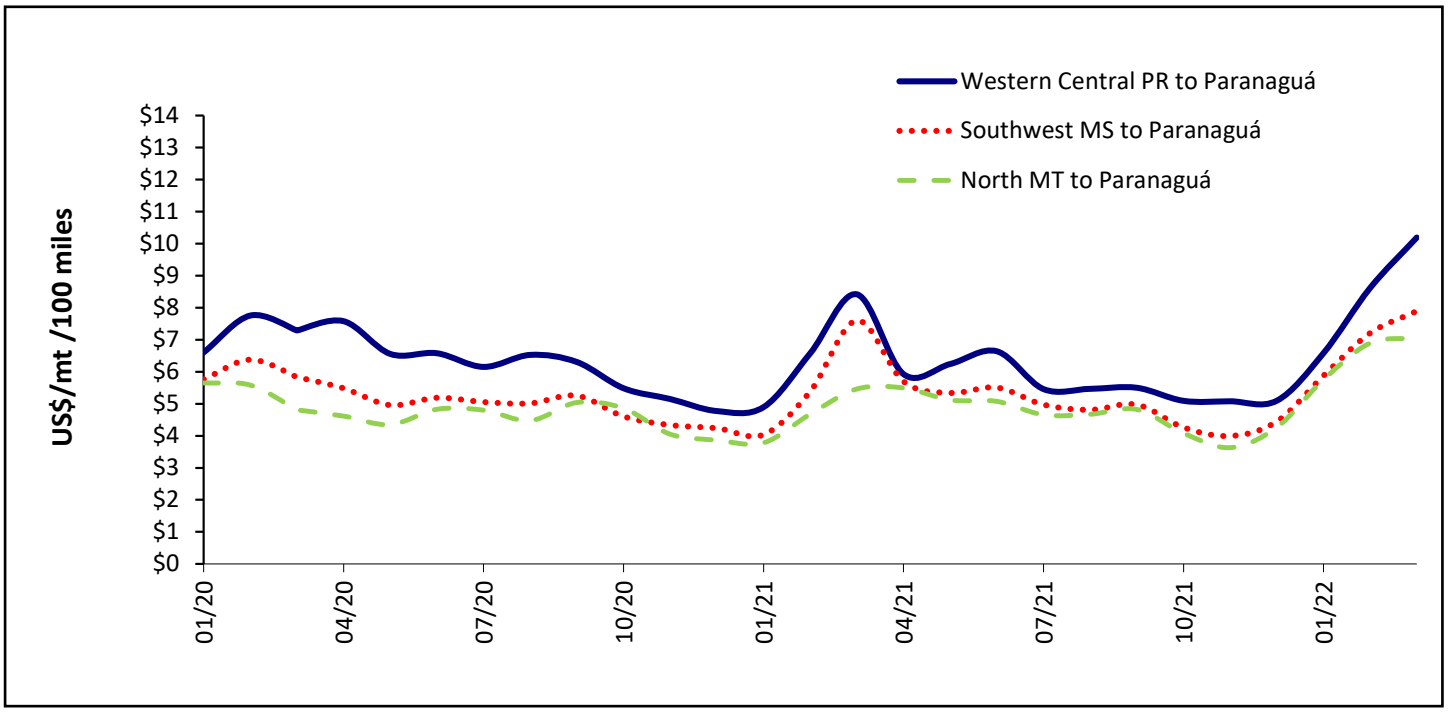
Table 8. Monthly Brazilian soybean export truck transportation cost index

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-15	8.01	0.7	138.15	Jan-19	7.72	7.5	133.13
Feb-15	8.02	0.1	138.29	Feb-19	8.19	6.0	141.15
Mar-15	8.32	3.7	143.44	Mar-19	7.34	-10.3	126.61
Apr-15	9.00	8.2	155.13	Apr-19	7.16	-2.6	123.35
May-15	8.39	-6.8	144.58	May-19	6.73	-5.9	116.02
Jun-15	8.01	-4.5	138.12	Jun-19	6.94	3.1	119.56
Jul-15	7.56	-5.7	130.25	Jul-19	8.33	20.1	143.60
Aug-15	7.38	-2.4	127.15	Aug-19	7.85	-5.8	135.23
Sep-15	6.60	-10.5	113.78	Sep-19	7.09	-9.7	122.17
Oct-15	6.70	1.5	115.43	Oct-19	6.57	-7.4	113.19
Nov-15	7.08	5.8	122.08	Nov-19	6.41	-2.3	110.54
Dec-15	6.76	-4.5	116.56	Dec-19	5.93	-7.5	102.21
Jan-16	6.42	-5.1	110.63	Jan-20	6.03	1.7	103.90
Feb-16	6.73	4.8	115.98	Feb-20	6.76	12.2	116.52
Mar-16	7.79	15.8	134.33	Mar-20	6.20	-8.2	106.95
Apr-16	8.30	6.5	143.05	Apr-20	5.86	-5.5	101.09
May-16	7.28	-12.3	125.43	May-20	5.26	-10.4	90.58
Jun-16	7.16	-1.5	123.51	Jun-20	5.45	3.7	93.95
Jul-16	7.46	4.2	128.64	Jul-20	5.44	-0.2	93.74
Aug-16	7.33	-1.7	126.41	Aug-20	5.41	-0.4	93.34
Sep-16	6.35	-13.3	109.53	Sep-20	5.58	3.0	96.14
Oct-16	5.88	-7.5	101.35	Oct-20	4.97	-10.8	85.71
Nov-16	5.00	-14.9	86.21	Nov-20	4.58	-7.9	78.95
Dec-16	5.47	9.4	94.32	Dec-20	4.32	-5.8	74.39
Jan-17	7.32	33.8	126.20	Jan-21	4.26	-1.3	73.39
Feb-17	9.85	34.6	169.85	Feb-21	5.60	31.5	96.50
Mar-17	10.38	5.3	178.90	Mar-21	6.93	23.8	119.49
Apr-17	9.52	-8.3	164.05	Apr-21	6.20	-10.5	106.96
May-17	8.75	-8.0	150.90	May-21	5.76	-7.2	99.22
Jun-17	8.18	-6.5	141.04	Jun-21	5.87	2.0	101.22
Jul-17	8.74	6.8	150.66	Jul-21	5.09	-13.4	87.70
Aug-17	9.85	12.7	169.76	Aug-21	5.09	0.1	87.81
Sep-17	8.97	-9.0	154.55	Sep-21	5.31	4.2	91.53
Oct-17	8.64	-3.6	148.93	Oct-21	4.49	-15.5	77.36
Nov-17	8.36	-3.2	144.11	Nov-21	4.28	-4.6	73.80
Dec-17	7.23	-13.5	124.63	Dec-21	4.54	6.0	78.26
Jan-18	7.59	5.0	130.90	Jan-22	5.94	30.9	102.42
Feb-18	8.65	13.9	149.04	Feb-22	7.77	30.8	134.02
Mar-18	10.59	22.5	182.61	Mar-22	8.59	10.4	147.99
Apr-18	9.78	-7.7	168.59				
May-18	8.96	-8.4	154.45				
Jun-18	8.89	-0.8	153.24				
Jul-18	8.97	0.9	154.58				
Aug-18	8.24	-8.1	142.00				
Sep-18	7.24	-12.1	124.78				
Oct-18	7.69	6.2	132.55				
Nov-18	7.51	-2.3	129.44				
Dec-18	7.19	-4.3	123.87				

*Weighted average is calculated from production-based shares to weigh high-volume routes more heavily than low-volume routes. The share associated with each route is used to define the weight of a given route's freight price in the composition of the monthly weighted export truck freight index.

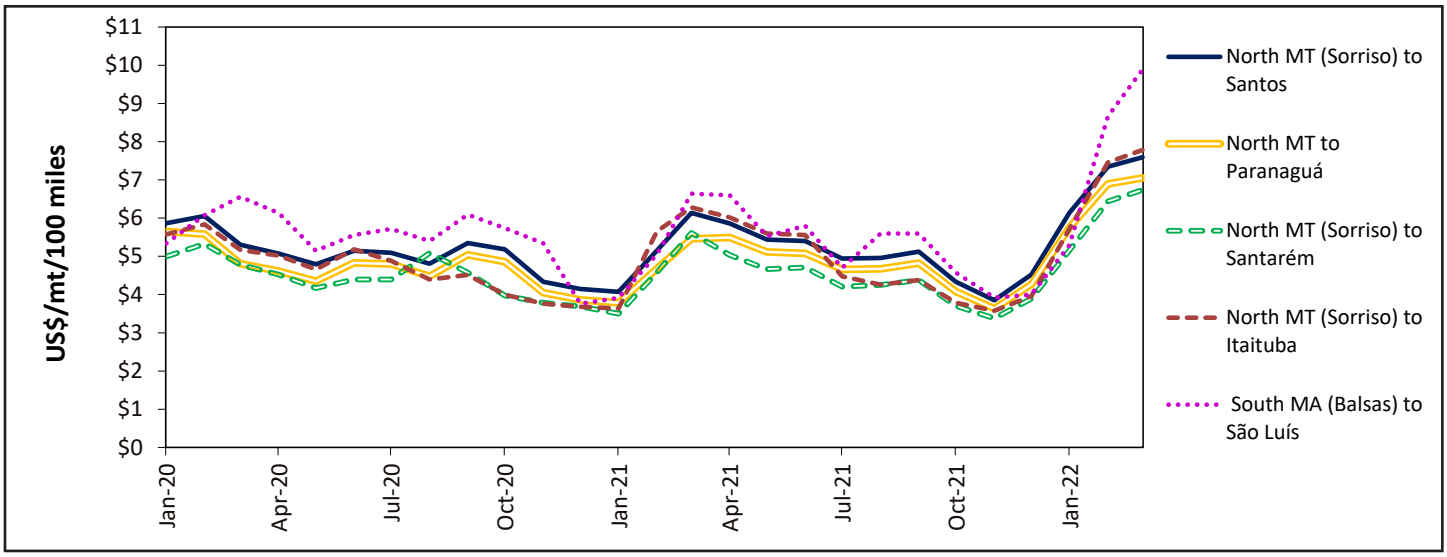
Source: University of São Paulo, Escola Superior de Agricultura “Luiz de Queiroz,” Brazil (ESALQ/USP) and USDA, Agricultural Marketing Service.

Figure 3. Truck rates for selected southern Brazilian soybean export transportation routes, 2020-22



Note: mt = metric ton. PR = Paraná, MT= Mato Grosso, and MS = Mato Grosso do Sul.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

Figure 4. Truck rates for selected north, south, and northeastern Brazilian soybean export transportation routes, 2020-22



Note: mt = metric ton. MT= Mato Grosso and MA = Maranhão.
Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

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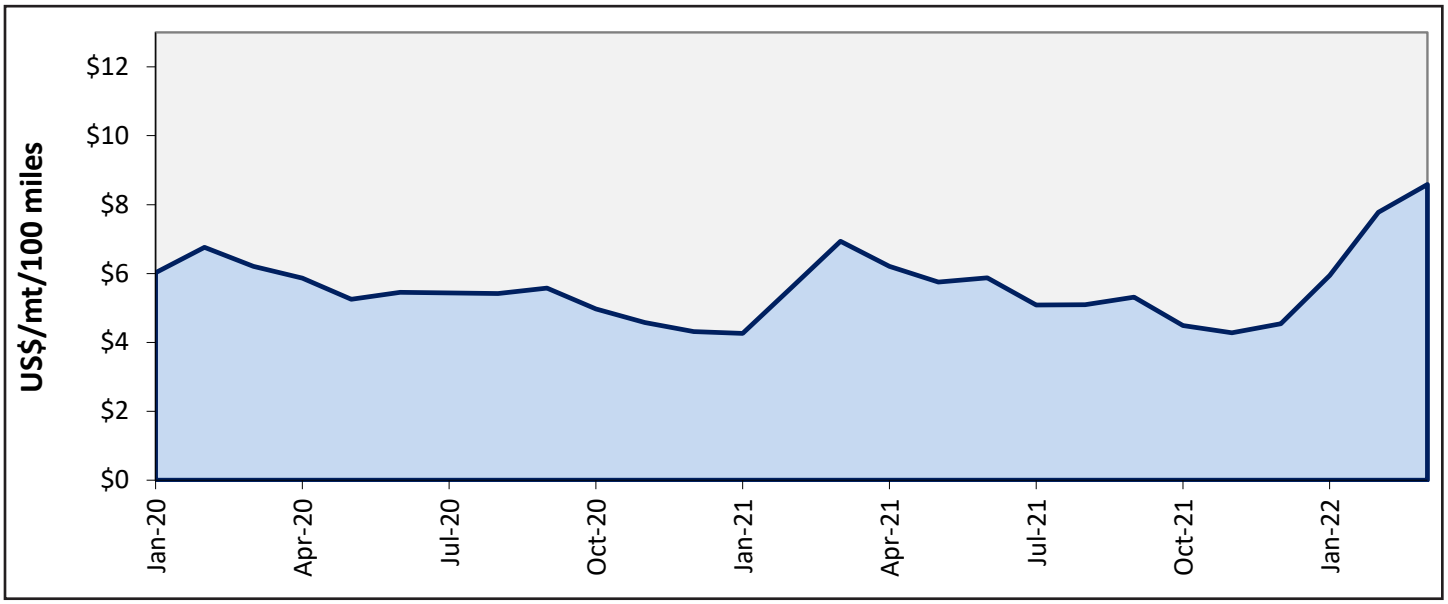
Figure 5. Brazilian soybean export truck transportation weighted average prices, 2020-22



Note: mt = metric ton.

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

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Table 9. Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Germany and China (US$/metric ton)*

Port	Destination	1st qtr. 2017	2nd qtr. 2017	3rd qtr. 2017	4th qtr. 2017
Santos	Germany (Hamburg)	21.00	24.00	26.00	27.00
Paranaguá	Germany (Hamburg)	22.00	25.00	27.00	28.00
Rio Grande	Germany (Hamburg)	22.00	25.00	27.00	28.00
Santarém	Germany (Hamburg)	21.00	23.60	25.00	26.00
São Luís	Germany (Hamburg)	17.60	20.00	21.20	22.00
Barcarena	Germany (Hamburg)	18.00	20.60	21.80	22.70
Santos	China (Shanghai)	18.50	29.00	30.00	30.00
Paranagua	China (Shanghai)	20.50	30.50	31.00	31.50
Rio Grande	China (Shanghai)	18.00	29.50	31.00	30.70
Santarém	China (Shanghai)	24.00	33.50	31.00	34.50
São Luís	China (Shanghai)	23.50	30.25	31.00	33.50
Barcarena	China (Shanghai)	24.00	33.50	31.00	34.50
Port	**Destination**	**1st qtr. 2018**	**2nd qtr. 2018**	**3rd qtr. 2018**	**4th qtr. 2018**
Santos	Germany (Hamburg)	27.00	25.00	24.00	25.00
Paranaguá	Germany (Hamburg)	28.00	26.00	25.00	26.00
Rio Grande	Germany (Hamburg)	28.00	26.00	25.00	26.00
Santarém	Germany (Hamburg)	25.00	22.90	22.50	23.00
São Luís	Germany (Hamburg)	21.00	19.10	18.50	19.00
Barcarena	Germany (Hamburg)	23.00	20.90	20.20	20.00
Santos	China (Shanghai)	32.50	31.00	27.75	30.00
Paranagua	China (Shanghai)	32.00	32.00	28.75	31.00
Rio Grande	China (Shanghai)	33.00	31.50	28.25	31.50
Santarém	China (Shanghai)	38.50	35.50	31.25	34.00
São Luís	China (Shanghai)	37.00	34.80	30.75	33.00
Barcarena	China (Shanghai)	37.50	33.80	32.25	35.00
Port	**Destination**	**1st qtr. 2019**	**2nd qtr. 2019**	**3rd qtr. 2019**	**4th qtr. 2019**
Santos	Germany (Hamburg)	23.00	21.50	27.00	31.00
Paranaguá	Germany (Hamburg)	23.00	21.25	27.00	30.75
Rio Grande	Germany (Hamburg)	23.00	21.25	27.00	31.25
Santarém	Germany (Hamburg)	21.00	20.25	25.92	26.50
São Luís	Germany (Hamburg)	18.00	17.10	22.77	23.50
Barcarena	Germany (Hamburg)	19.00	17.85	23.52	24.25
Santos	China (Shanghai)	32.25	30.92	33.25	38.17
Paranagua	China (Shanghai)	33.75	31.42	34.75	39.50
Rio Grande	China (Shanghai)	31.58	30.25	34.25	39.67
Santarém	China (Shanghai)	32.25	30.58	38.25	39.17
São Luís	China (Shanghai)	31.00	30.58	38.25	39.42
Barcarena	China (Shanghai)	32.25	29.92	38.25	39.42

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Port	Destination	1st qtr. 2020	2nd qtr. 2020	3rd qtr. 2020	4th qtr. 2020
Santos	Germany (Hamburg)	29.25	20.50	24.00	25.25
Paranaguá	Germany (Hamburg)	30.00	21.50	25.00	25.35
Rio Grande	Germany (Hamburg)	29.50	20.75	24.50	25.75
Santarém	Germany (Hamburg)	25.00	16.00	20.75	22.00
São Luís	Germany (Hamburg)	22.25	17.50	25.00	26.30
Barcarena	Germany (Hamburg)	24.00	15.00	20.50	21.75
Santos	China (Shanghai)	35.50	27.08	31.33	31.67
Paranagua	China (Shanghai)	37.25	28.83	33.08	33.42
Rio Grande	China (Shanghai)	37.00	28.58	32.83	33.17
Santarém	China (Shanghai)	36.50	28.08	34.83	35.21
São Luís	China (Shanghai)	36.75	28.33	35.33	35.67
Barcarena	China (Shanghai)	38.50	28.33	36.33	36.67
Port	**Destination**	**1st qtr. 2021**	**2nd qtr. 2021**	**3rd qtr. 2021**	**4th qtr. 2021**
Santos	Germany (Hamburg)	31.25	42.70	54.00	52.50
Paranaguá	Germany (Hamburg)	31.00	41.90	53.00	51.50
Rio Grande	Germany (Hamburg)	32.00	43.80	55.50	53.80
Santarém	Germany (Hamburg)	28.65	40.00	50.60	49.10
São Luís	Germany (Hamburg)	33.25	45.90	58.00	56.30
Barcarena	Germany (Hamburg)	28.10	38.90	49.20	47.80
Santos	China (Shanghai)	37.00	50.60	64.00	62.00
Paranagua	China (Shanghai)	38.75	52.40	66.00	64.00
Rio Grande	China (Shanghai)	37.25	51.00	64.75	62.75
Santarém	China (Shanghai)	40.54	55.60	67.50	65.60
São Luís	China (Shanghai)	41.00	56.60	68.00	66.00
Barcarena	China (Shanghai)	42.00	58.20	70.00	68.00
Port	**Destination**	**1st qtr. 2022**	**2nd qtr. 2022**	**3rd qtr. 2022**	**4th qtr. 2022**
Santos	Germany (Hamburg)	52.70			
Paranaguá	Germany (Hamburg)	51.50			
Rio Grande	Germany (Hamburg)	54.00			
Santarém	Germany (Hamburg)	49.10			
São Luís	Germany (Hamburg)	56.50			
Barcarena	Germany (Hamburg)	48.00			
Santos	China (Shanghai)	62.00			
Paranagua	China (Shanghai)	64.00			
Rio Grande	China (Shanghai)	62.75			
Santarém	China (Shanghai)	66.00			
São Luís	China (Shanghai)	66.20			
Barcarena	China (Shanghai)	68.00			

*The rates correspond to the average actual values negotiated between shippers and carriers and qtr. = weighted according to the magnitude of the shipped volume.

Note: qtr. = quarter.

Source: University of São Paulo, Escola Superior de Agricultura "Luiz de Queiroz," Brazil (ESALQ/ USP) and USDA, Agricultural Marketing Service.

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Data Sets (XLS files):

- Figure 3. Truck rates for selected southern Brazilian soybean export transportation routes, 2020-22
- Figure 4. Truck rates for selected north, south, and northeastern Brazilian soybean export transportation routes, 2020-22
- Figure 5. Brazilian soybean export truck transportation weighted average prices, 2020-22
- Table 1. Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China
- Table 1a. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China
- Table 2. Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany
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- Table 4. Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany, 2022
- Table 5. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China, 2022
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