

Brazil Soybean Transportation

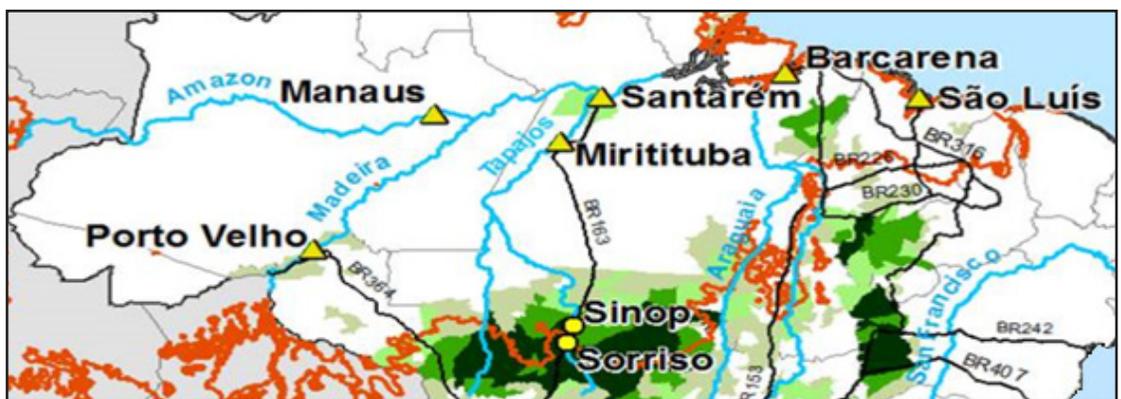
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Infrastructure Transportation Update

Private Investment at Miritituba Facilitates Grain Flows through Santarém and Barcarena as Unfinished BR-163 Bottleneck Exports.

On April 25, 2014, Bunge created a new export route from Miritituba to Barcarena (Vila do Conde), adding a new gateway to grain exports from North Mato Grosso (MT). Savings from efficiencies gained at the Miritituba's transshipment terminal offset the cost of shipping grain through the Panama Canal to China. The Amazon River ports of Santarém and Barcarena also saw increased competitiveness to Europe, Middle East, and Mexico. As of today, three barge companies (Betolini, Hidrovias to Brazil, and Companhia Norte de Navegação de Porto (CIANPORT)), and Cargill built additional terminals at Miritituba. CIANPORT is a joint venture between Fiagril (Lucas do Rio Verde) and Agrosoja (Sorriso). Barcarena is MT's second largest soybean export port, after Santos (table 1). Since 2014, North MT shifted soybean shipments to Barcarena from the ports of Rio Grande (RS), São Francisco do Sul (SC), Vitória (ES), Paranaguá (PR), and São Luís (MA) (table 1). The channel depth at Barcarena-Vila do Conde is 13.5 meters during the dry season and 17-17.5 meters during the rainy season. The grain exported through this port uses Panamax vessels. Export capacity is limited to Panamax vessels because the depth of the Quiriri channel to the Atlantic Ocean is 13.3 meters. Post-Panamax vessels require 17 meters channel depth. There is a proposed project to dredge the Quiriri channel to 14.3 meters by July 2018. Miritituba and Barcarena have static storage capacity of 400,000 and 500,000 metric tons (mt), respectively. Both have a long-term export capacity of about 15-18 million mt.

Figure 1. The Northern Arc ports



Source: USDA/Agricultural Marketing Service & Foreign Agricultural Service (FAS)

Figure 1 shows the Northern Arc ports complex that includes: Itacoatiara/Manaus (Amazon River), Santarém (Amazon River), Barcarena (Pará River), São Luís (Maranhão, MA), Porto Velho (MT) and Miritituba (PA) (Barge transshipment terminals). The distance by truck from Sorriso, North MT, largest grain producer of Brazil, to Miritituba is 663 miles (1,067 km), through BR-163. Currently, it takes 3 days to ship grain to Miritituba because of the poor condition of the last 56 miles (90 km of unpaved road) of BR-163 connecting Sorriso to Miritituba. Travel time will be reduced to 1.5 days after this section is finished.

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BR-163 Status.

The construction of BR-163 is divided in three sections:

- Sections 1 and 2: expansion is ongoing to add two more lanes, totaling two lanes on each side through concessions to the private sector.
- Section 3: located in the State of Pará (PA). The Brazilian Government is responsible for building this section through the Army Engineer Construction Battalion (BEC).

The Brazilian government announced that the 56 miles connecting Sorriso to Mirrituba will be finished by December 2018. However, delays may occur because of:

- Uncertainty created by the political crisis that resulted from Operation Car Wash (operation Lava Jato¹).
- Construction is limited to the dry season. In the Amazon region there are two seasons: (1) rainy: December to May; and (2) dry: June to November.
- The expected increase in corn exports this year which will likely slow construction on BR-163 because of heavy traffic.
- Truck driver and community strikes that stop traffic.

Table 1. Mato Grosso (MT) soybean exports by port, 2012 - July 2017

Port	2012	2013	2014	2015	2016	2017*
	metric ton (mt)					
Santos	6,137,699	7,129,287	7,199,615	6,497,393	7,148,369	8,043,178
Barcarena	0	0	624,814	1,615,255	1,812,740	2,876,039
Manaus	1,093,313	946,433	912,594	1,133,061	1,434,848	1,462,344
Santarém	528,112	660,281	615,190	614,308	1,249,146	1,256,441
São Luís	282,375	536,540	505,792	1,027,032	1,320,970	1,010,638
Paranaguá	1,249,304	1,222,308	1,494,180	846,372	630,246	484,570
Vitória	781,758	1,158,924	1,394,114	1,680,145	895,465	409,892
Imbituba	0	0	377,263	245,485	294,666	171,559
São Francisco do Sul	413,577	551,616	758,867	611,328	433,949	175,984
Rio Grande	37,258	83,000	285,174	213,095	1,543	58,578
Pacaraima	0	0	0	0	136	409
Bonfim	0	0	50	0	0	0
Aracaju	0	0	0	28,728	0	0
Ilheus	0	1,467	9,974	0	0	0
Salvador	0	5,643	33,398	2,628	0	0
Total	10,523,396	12,295,500	14,211,027	14,514,829	15,222,273	15,949,631

*January to July 2017

Source: Secretariat of Foreign Trade (SECEX), MDIC

1 Operation Car Wash (Lava Jato) is a deep and prolonged corruption investigation.



Ferrogrão Railroad (EF-170)-Selected infrastructure project improvements proposal. Ferrogrão Railroad (EF-170) is a priority of Project Crescer and the Brazilian government's Investment Partnerships Program. This railroad consolidates the new Brazilian export rail corridor of the "Arco Norte" by connecting Sinop (North MT), a main grain-producing region, to Miritituba, Pará (PA) (figure 1 and table 2). Miritituba is a transshipment terminal on the Tapajós Rivers, which is part of the Amazon hydrographic basin. The EF-170 is expected to increase transport capacity and competitiveness to the corridor and alleviate traffic conditions on highway BR-163 by opening a new route for the soybean, soybean meal, corn, beef, and cotton exports. It is estimated that about 50 million tons of fertilizers will be backhauled to MT Northern production regions. By 2050 Mato Grosso is expected to produce 117.8 million tons of grain (table 2). Ferrogrão is expected to haul 50 percent of the MT total exports.

Current status: Public audience is scheduled in September 2017.

Table 2. Ferrogrão expected share of Mato Grosso (MT) grain

Mato Grosso (MT)	2021	2030	2040	2050
	1,000 tons			
Production	65,000	90,000	105,000	115,000
Exports	40,000	55,000	65,000	75,000
Ferrogrão: share of MT grain exports	20,000	27,500	32,500	37,500
% share of MT grain exports	50	50	50	50

Source: EDLP - Estação da Luz Participações (contato@edlp.com.br)

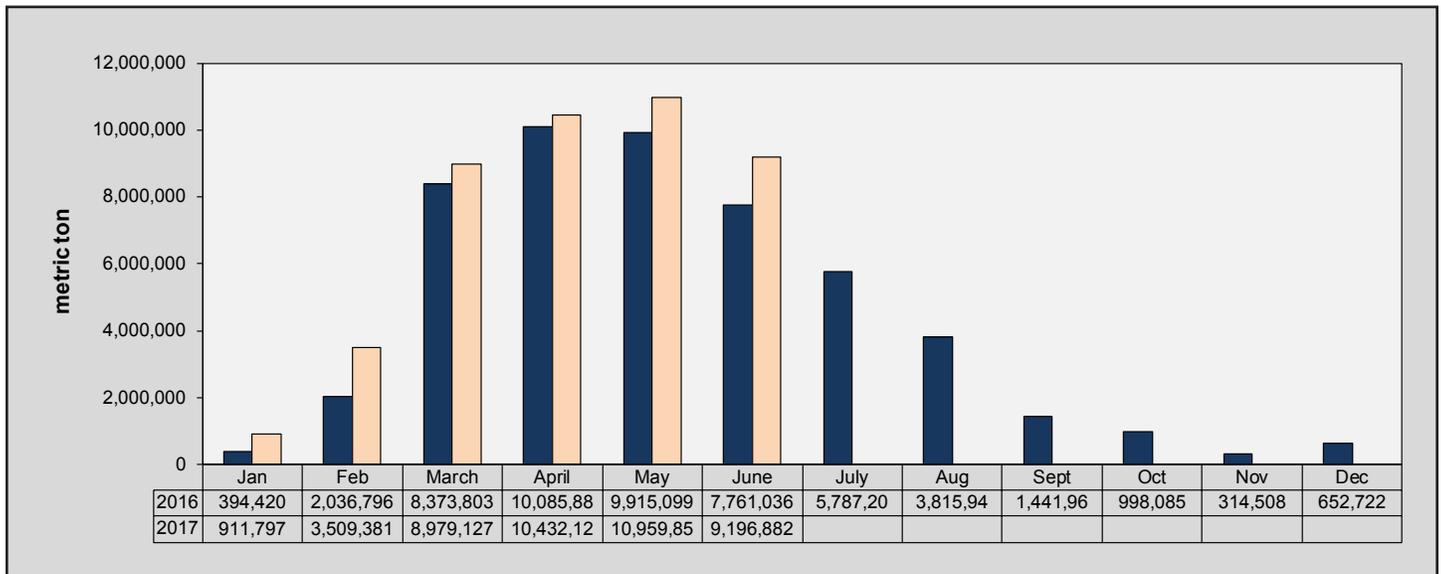


Record Harvest Increased Soybean Transportation Costs: Good weather conditions, increased planting area, and higher productivity resulted in a nearly 20 percent increase in soybean production to 114 million metric ton (mmt) in 2017 compared with 95.4 mmt last year ([National Company of Food Supply \(CONAB\)](#)). During the peak of the harvest season, the cost of shipping a metric ton (mt) of soybeans 100 miles by truck increased 16 percent to \$8.82 from \$7.58 in the second quarter of 2016 (table 9).

Ocean rates to Hamburg, Germany, and Shanghai, China, increased significantly due to high export demand, especially to China (tables 3, 3a, 4, 4a, and 11). During the second quarter of 2017, Brazil exported 30.5 (mmt, 10 percent more soybeans than during the second quarter of 2016 (27.7 mmt), mostly during April and May ([Secretariat of Foreign Trade \(SECEX\)](#)). By the end of July, Brazilian soybean exports increased 15 percent to nearly 51 mmt from 44.3 mmt at the same time last year (figure 1a), especially to China, through the Ports of Santos, Paranaguá, Rio Grande, São Luis, São Francisco do Sul and Barcarena (figure 1b).

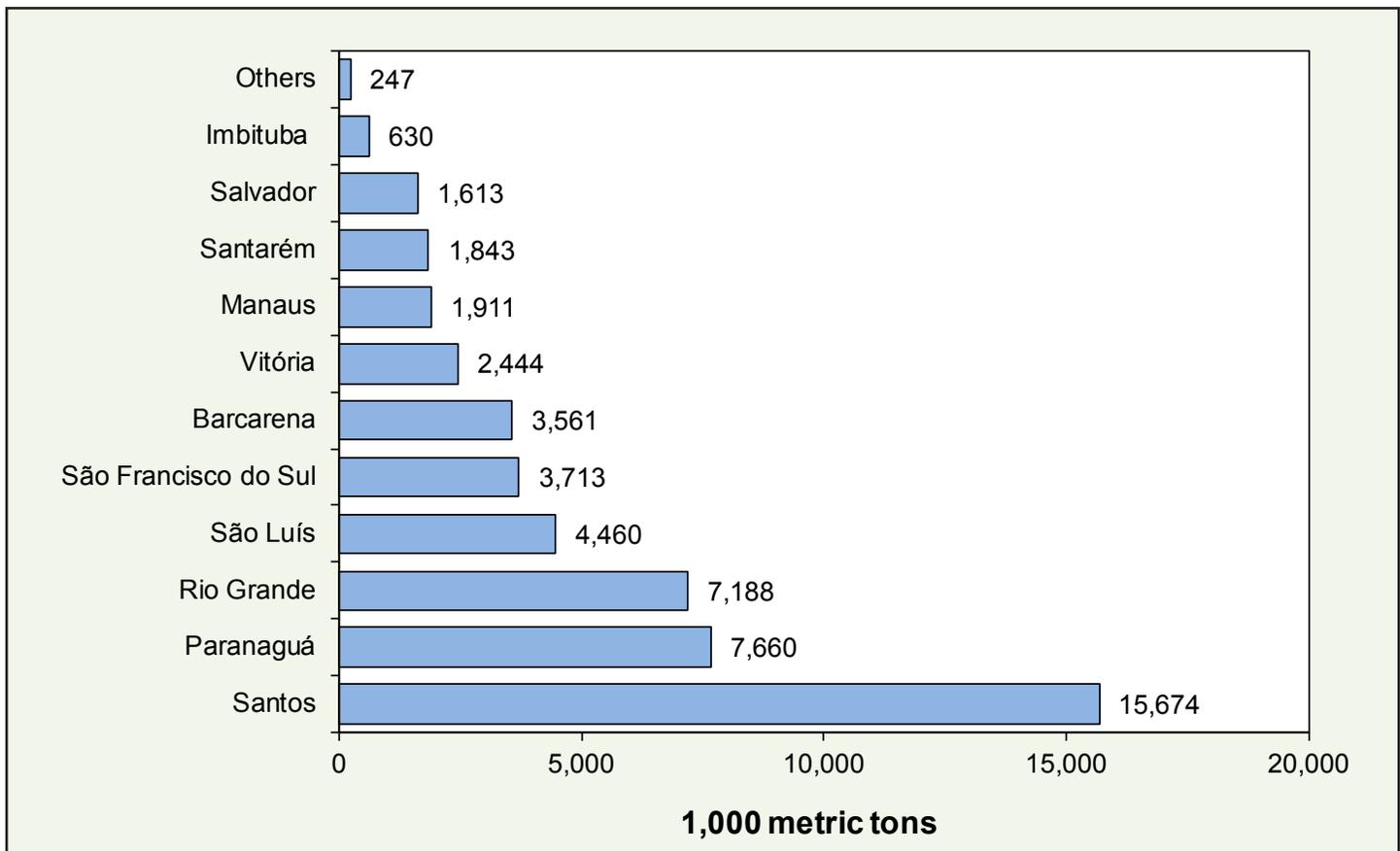


Figure 1a. Brazil average monthly soybean exports



Source: Secretariat of Foreign Trade (SECEX), MDIC

Figure 1b. Brazil soybean exports by port, January-July 2017



Source: Secretariat of Foreign Trade (SECEX), MDIC



During the second quarter of 2017, the Brazilian real (R\$) appreciated 8.4 percent against the dollar, to R\$3.21 per US\$1.00 from R\$3.51 at the same period in 2016, and 8 percent compared with the 2016 average of about R\$3.50 per US\$1.00 ([Brazil Central Bank](#)). Average Brazilian soybean export prices increased 10 percent to US\$ 371 per mt from US\$ 365 per mt at the same time last year ([SECEX](#)). However, the appreciation of the Brazilian real against the U.S. dollar and higher transportation costs lowered farm (domestic) prices compared with the second quarter 2016. Soybeans are priced in U.S. dollars, but are paid in Reais. Farm prices measured in Reais decreased nearly 21 percent on average. Mato Grosso (MT) farm prices averaged R\$885.67 per metric ton.

China is Brazil's major soybean buyer, accounting for 77 percent of total exports, followed by Spain, Thailand, Netherlands, and Iran. China bought 39.4 million mt of Brazilian soybeans from January to July 2017, valued at US\$14.8 billion ([SECEX, MDIC](#)). The southern ports of Santos, Paranaguá, Rio Grande, and São Francisco do Sul accounted for 67 percent of total soybean exports and 76 percent of exports to China (figure 1). The Northeastern ports of São Luís, Barcarena, Vitoria, and Salvador exported about 24 percent of Brazilian soybeans and 22 percent of exports to China. The Northern ports of Santarém and Manaus represented 8 percent of total Brazil exports and 2 percent of exports to China.

In Sorriso, North MT (the largest Brazilian soybean-producing State), transportation costs represented 30 percent of the total landed costs of shipping soybeans to Shanghai through Santos and about 24 percent through the port of Santarém (tables 3 and 3a).

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

	2016 2nd qtr	2017 2nd qtr	% Change	2016 2nd qtr	2017 2nd qtr	% Change
	North MT¹ - Santos² --US\$/mt--			Northwest RS¹ - Rio Grande² --US\$/mt--		
Truck	81.75	90.63	10.9	26.63	30.66	15.1
Ocean	16.50	29.00	75.8	17.00	29.50	73.5
Total transportation	98.25	119.63	21.8	43.63	60.16	37.9
Farm price ³	347.59	275.60	-20.7	358.57	302.06	-15.8
Landed cost	445.84	395.23	-11.4	402.20	362.22	-9.9
Transport % of landed cost	22.0	30.3	37.4	10.8	16.6	53.1
	North Central PR¹ - Paranaguá² --US\$/mt--			South GO¹ - Santos² --US\$/mt--		
Truck	24.12	28.25	17.1	38.78	43.39	11.9
Ocean	18.50	30.50	64.9	16.50	29.00	75.8
Total transportation	42.62	58.75	37.9	55.28	72.39	31.0
Farm price ³	353.78	313.78	-11.3	337.86	281.73	-16.6
Landed cost	396.39	372.53	-6.0	393.14	354.12	-9.9
Transport % of landed cost	10.75	15.77	46.7	14.1	20.4	45.4

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



Table 3a. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China

	2016 2nd qtr	2017 2nd qtr	% Change	2016 2nd qtr	2017 2nd qtr	% Change
	North MT¹ - Santarém² --US\$/mt--			South MA¹ - São Luís² --US\$/mt--		
Truck	58.93	53.69	-8.9	33.86	38.89	14.8
Ocean	21.00	33.50	59.5	18.40	30.25	64.4
Total transportation	79.93	87.19	9.1	52.26	69.14	32.3
Farm price ³	347.59	275.60	-20.7	378.45	327.17	-13.6
Landed cost	427.53	362.78	-15.1	430.72	396.30	-8.0
Transport % of landed cost	18.7	24.0	28.5	12.1	17.4	43.8
	Southwest PI¹ - São Luís² --US\$/mt--					
Truck	39.6	44.1	11.2			
Ocean	18.4	30.3	64.4			
Total transportation	58.0	74.3	28.1			
Farm price ³	342.0	304.2	-11.1			
Landed cost	400.1	378.5	-5.4			
Transport % of landed cost	14.5	19.6	35.4			

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



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

	2016 2nd qtr	2017 2nd qtr	% Change	2016 2nd qtr	2017 2nd qtr	% Change
	North MT¹ - Santos² --US\$/mt--			Northwest RS¹ - Rio Grande² --US\$/mt--		
Truck	81.75	90.63	10.9	26.63	30.66	15.1
Ocean	17.00	24.00	41.2	17.00	25.00	47.1
Total transportation	98.75	114.63	16.1	43.63	55.66	27.6
Farm price ³	347.59	275.60	-20.7	358.57	302.06	-15.8
Landed cost	446.34	390.23	-12.6	402.20	357.72	-11.1
Transport % of landed cost	22.1	29.4	32.8	10.8	15.6	43.4
	North Central PR¹ - Paranaguá² --US\$/mt--			South GO¹ - Santos² --US\$/mt--		
Truck	24.12	28.25	17.1	38.78	43.39	11.9
Ocean	17.00	25.00	47.1	17.00	24.00	41.2
Total transportation	41.12	53.25	29.5	55.78	67.39	20.8
Farm price ³	353.78	313.78	-11.3	337.86	281.73	-16.6
Landed cost	394.89	367.03	-7.1	393.64	349.12	-11.3
Transport % of landed cost	10.4	14.5	39.3	14.2	19.3	36.2

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



Table 4a. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany

	2016 2nd qtr	2017 2nd qtr	% Change	2016 2nd qtr	2017 2nd qtr	% Change
	North MT¹ - Santarém² --US\$/mt--			South MA¹ - São Luís² --US\$/mt--		
Truck	58.93	53.69	-8.9	33.86	38.89	14.8
Ocean	14.13	23.60	67.0	11.00	20.00	81.8
Total transportation	73.06	77.29	5.8	44.86	58.89	31.3
Farm price ³	347.59	275.60	-20.7	378.45	327.17	-13.6
Landed cost	420.66	352.88	-16.1	423.32	386.05	-8.8
Transport % of landed cost	17.4	21.9	26.1	10.6	15.3	43.9
	Southwest PI¹ - São Luís² --US\$/mt--					
Truck	39.61	44.1	11.2			
Ocean	11.00	20.0	81.8			
Total transportation	50.61	64.1	26.6			
Farm price ³	342.05	304.2	-11.1			
Landed cost	392.65	368.2	-6.2			
Transport % of landed cost	12.9	17.4	35.0			

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

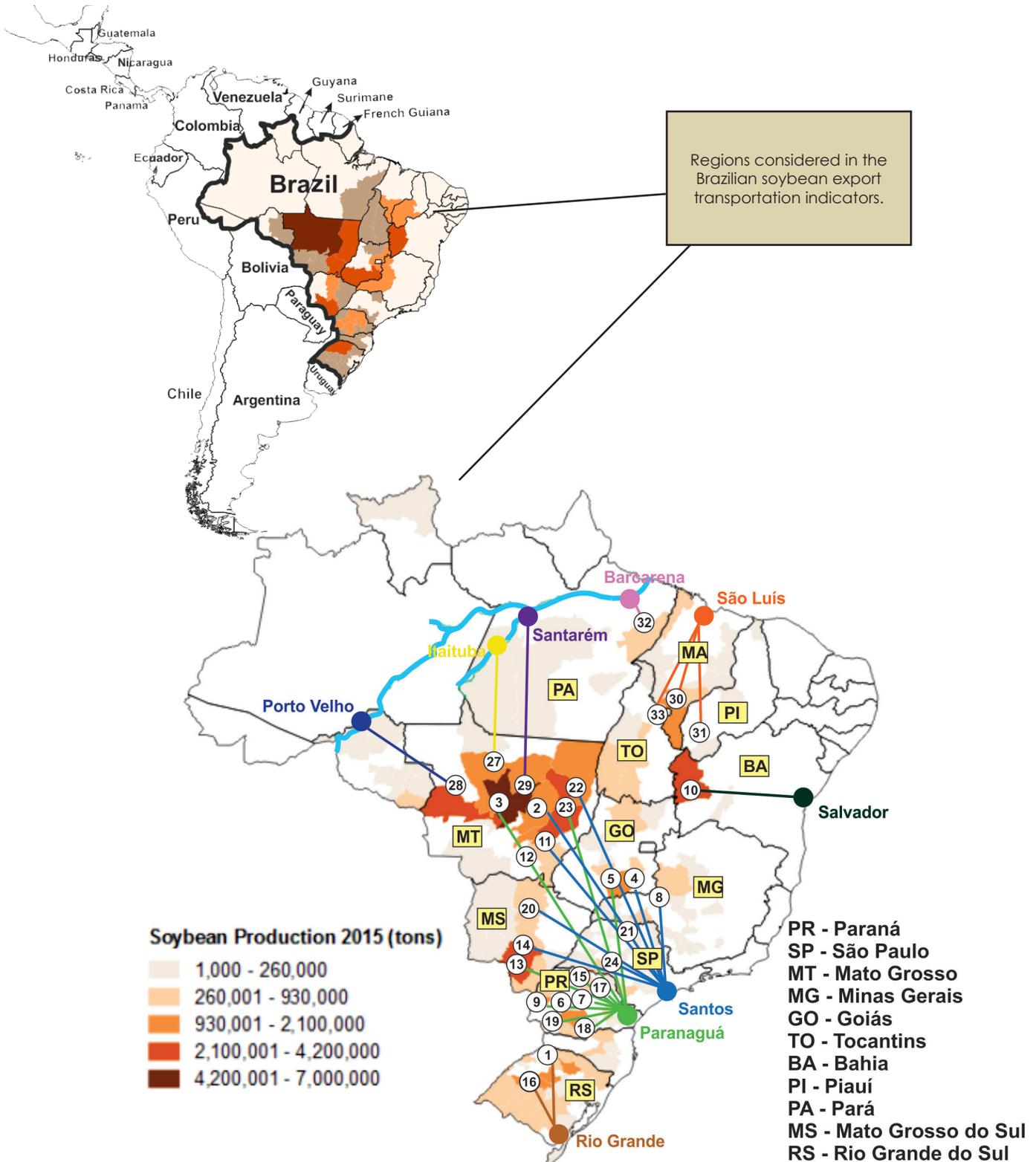
²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



Figure 2. Routes¹ and regions considered in the Brazilian soybean export transportation indicator²



¹Table defining routes by number is shown on page 12

²Regions comprised about 81 percent of Brazilian soybean production, 2015

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS



Table 5. Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China

-----2017-----										
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santos² --US\$/mt--					North MT¹ - Paranaguá² --US\$/mt--				
Truck	93.28	90.63			91.96	90.67	87.47			89.07
Ocean	18.50	29.00			23.75	18.00	30.50			24.25
Total transportation	111.78	119.63			115.71	108.67	117.97			113.32
Farm price ³	314.10	275.60			294.85	314.10	275.60			294.85
Landed cost	425.88	395.23			410.55	422.77	393.57			408.17
Transport % of landed cost	26.2	30.3			28.3	25.7	30.0			27.8
	Southeast MT¹ - Santos² --US\$/mt--					North Central PR¹ - Paranaguá² --US\$/mt--				
Truck	66.68	61.94			64.31	31.26	28.25			29.76
Ocean	18.50	29.00			23.75	20.50	30.50			25.50
Total transportation	85.18	90.94			88.06	51.76	58.75			55.26
Farm price ³	314.10	275.60			294.85	344.08	313.78			328.93
Landed cost	399.27	366.54			382.91	395.85	372.53			384.19
Transport % of landed cost	21.3	24.8			23.1	13.1	15.8			14.4
	South GO¹ - Santos² --US\$/mt--					Northwest RS¹ - Rio Grande² --US\$/mt--				
Truck	46.97	43.39			45.18	33.20	30.66			31.93
Ocean	18.50	29.00			23.75	18.00	29.50			23.75
Total transportation	65.47	72.39			68.93	51.20	60.16			55.68
Farm price ³	332.40	281.73			307.06	347.99	302.06			325.02
Landed cost	397.86	354.12			375.99	399.19	362.22			380.70
Transport % of landed cost	16.5	20.4			18.4	12.8	16.6			14.7

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS



Table 6. Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany

	-----2017-----									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santos² --US\$/mt--					North MT¹ - Paranaguá² --US\$/mt--				
Truck	93.28	90.63			91.96	90.67	87.47			89.07
Ocean	21.00	24.00			22.50	22.00	25.00			23.50
Total transportation	114.28	114.63			114.46	112.67	112.47			112.57
Farm price ³	314.10	275.60			294.85	314.10	275.60			294.85
Landed cost	428.38	390.23			409.30	426.77	388.07			407.42
Transport % of landed cost	26.7	29.4			28.0	26.4	29.0			27.7
	Southeast MT¹ - Santos² --US\$/mt--					North Central PR¹ - Paranaguá² --US\$/mt--				
Truck	66.68	61.94			64.31	31.26	28.25			29.76
Ocean	21.00	24.00			22.50	22.00	25.00			23.50
Total transportation	87.68	85.94			86.81	53.26	53.25			53.26
Farm price ³	314.10	275.60			294.85	344.08	313.78			328.93
Landed cost	401.77	361.54			381.66	397.35	367.03			382.19
Transport % of landed cost	21.8	23.8			22.8	13.4	14.5			14.0
	South GO¹ - Santos² --US\$/mt--					Northwest RS¹ - Rio Grande² --US\$/mt--				
Truck	46.97	43.39			45.18	33.20	30.66			31.93
Ocean	21.00	24.00			22.50	22.00	25.00			23.50
Total transportation	67.97	67.39			67.68	55.20	55.66			55.43
Farm price ³	332.40	281.73			307.06	347.99	302.06			325.02
Landed cost	400.36	349.12			374.74	403.19	357.72			380.45
Transport % of landed cost	17.0	19.3			18.1	13.7	15.6			14.6

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS



Table 7. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China

	-----2017-----									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santarém² --US\$/mt--					South MA¹ - São Luís² --US\$/mt--				
Truck	53.28	53.69			53.48	38.56	38.89			38.72
Ocean	24.00	33.50			28.75	23.50	30.25			26.88
Total transportation	77.28	87.19			82.23	62.06	69.14			65.60
Farm price ³	314.10	275.60			294.85	356.01	327.17			341.59
Landed cost	391.38	362.78			377.08	418.07	396.30			407.19
Transport % of landed cost	19.7	24.0			21.9	14.8	17.4			16.1
	Southwest PI¹ - São Luís² --US\$/mt--									
Truck	45.60	44.05			44.83					
Ocean	23.50	30.25			26.88					
Total transportation	69.10	74.30			71.70					
Farm price ³	210.49	304.16			257.33					
Landed cost	279.59	378.46			329.03					
Transport % of landed cost	24.7	19.6			22.2					

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS



Table 8. Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany

	-----2017-----									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santarém²					South MA¹ - São Luís²				
	--US\$/mt--					--US\$/mt--				
Truck	53.28	53.69			53.48	38.56	38.89			38.72
Ocean	21.00	23.60			22.30	17.60	20.00			18.80
Total transportation	74.28	77.29			75.78	56.16	58.89			57.52
Farm price ³	314.10	275.60			294.85	356.01	327.17			341.59
Landed cost	388.38	352.88			370.63	412.17	386.05			399.11
Transport % of landed cost	19.1	21.9			20.5	13.6	15.3			14.4
	Southwest PI¹ - São Luís²									
	--US\$/mt--									
Truck	45.60	44.05			44.83					
Ocean	17.60	20.00			18.80					
Total transportation	63.20	64.05			63.63					
Farm price ³	210.49	304.16			257.33					
Landed cost	273.69	368.21			320.95					
Transport % of landed cost	23.1	17.4			20.2					

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS



Table 9. Truck rates for selected Brazilian soybean export transportation routes, 2017

Route #	Origin ¹ (reference city)	Destination	Distance (miles) ²	Share (%) ³	Freight Price (US\$)				
					1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
					--- (per 100 miles) ⁴ ---				
1	Northwest RS5 (Cruz Alta)	Rio Grande	288	11.8	11.53	10.65			11.09
2	North MT (Sorriso)	Santos	1,190	3.2	7.84	7.62			7.73
3	North MT (Sorriso)	Paranaguá	1,262	3.0	7.18	6.93			7.06
4	South GO (Rio Verde)	Santos	587	4.3	8.00	7.39			7.70
5	South GO (Rio Verde)	Paranaguá	726	3.5	7.82	7.50			7.66
6	North Central PR (Londrina)	Paranaguá	268	3.5	11.67	10.54			11.10
7	Western Central PR (Mamborê)	Paranaguá	311	2.8	10.89	10.05			10.47
8	Triangle MG (Uberaba)	Santos	339	2.3	11.17	10.29			10.73
9	West PR (Assis Chateaubriand)	Paranaguá	377	2.7	9.84	9.02			9.43
10	West Extreme BA (São Desidério)	Salvador	535	5.7	8.41	8.79			8.60
11	Southeast MT (Primavera do Leste)	Santos	901	2.7	7.40	6.88			7.14
12	Southeast MT (Primavera do Leste)	Paranaguá	975	2.5	6.66	6.48			6.57
13	Southwest MS (Maracaju)	Paranaguá	612	3.1	8.48	7.92			8.20
14	Southwest MS (Maracaju)	Santos	652	2.9	8.14	7.87			8.00
15	West PR (Assis Chateaubriand)	Santos	550	1.8	8.45	7.98			8.21
16	East GO (Cristalina)	Santos	585	1.8	9.02	8.60			8.81
17	North PR (Cornélio Procópio)	Paranaguá	306	1.9	9.64	8.74			9.19
18	Eastern Central PR (Castro)	Paranaguá	130	2.3	16.61	14.74			15.67
19	South Central PR (Guarapuava)	Paranaguá	204	2.2	14.14	13.51			13.83
20	North Central MS (São Gabriel do Oeste)	Santos	720	2.1	7.14	6.80			6.97
21	Ribeirão Preto SP (Guairá)	Santos	314	0.0	9.47	8.65			9.06
22	Northeast MT (Canarana)	Santos	950	2.7	8.00	8.09			8.04
23	East MS (Chapadão do Sul)	Santos	607	0.0	7.27	6.84			7.06
24	Northeast MT (Canarana)	Paranaguá	1,075	3.0	6.90	7.42			7.16
25	Western Central RS (Tupanciretã)	Rio Grande	273	3.4	10.14	9.55			9.85
26	Southwest PR (Chopinzinho)	Paranaguá	291	1.8	14.04	13.55			13.79
27	North MT (Sorriso)	Itaituba	672	5.7	9.05	9.38			9.22
28	North MT (Sorriso)	Porto Velho	632	6.0	7.44	7.49			7.46
29	North MT (Sorriso)	Santarém	876	4.3	6.08	6.13			6.10
30	South MA (Balsas)	São Luís	482	2.2	8.01	8.07			8.04
31	Southwest PI (Bom Jesus)	São Luís	606	2.2	7.53	7.27			7.40
32	Southeast PA (Paragominas)	Barcarena	249	1.1	10.96	9.99			10.47
33	East TO (Campos Lindos)	São Luís	842	1.5	7.46	8.47			7.96
		Average	587	100.0	9.18	8.82			9.00

¹Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available

²Distance from the main city of the considered region to the mentioned ports

³Share is measured as a percentage of total production

⁴US\$ per metric ton (average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollar)

⁵RS = 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, TO = Tocantins

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



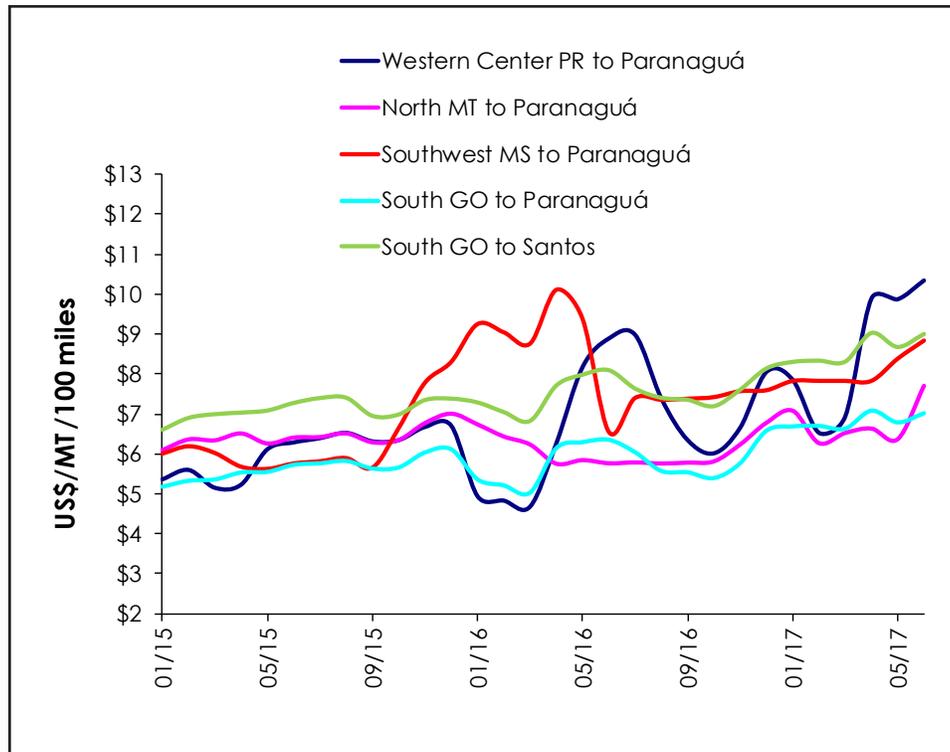
Table 10. Monthly Brazilian soybean export truck transportation cost index

Month	Freight price* (per 100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)	Month	Freight price* (per 100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)
Jan-10	9.17	1.7	158.10	Jan-14	8.86	-0.6	152.73
Feb-10	9.99	8.9	172.16	Feb-14	10.34	16.7	178.24
Mar-10	10.77	7.8	185.67	Mar-14	11.61	12.3	200.13
Apr-10	10.91	1.3	188.10	Apr-14	11.35	-2.2	195.65
May-10	10.80	-1.1	186.10	May-14	10.90	-4.0	187.89
Jun-10	10.61	15.7	182.95	Jun-14	10.34	-5.1	178.24
Jul-10	10.86	2.3	187.14	Jul-14	10.16	-1.7	175.21
Aug-10	11.21	3.3	193.23	Aug-14	10.10	-0.6	174.08
Sep-10	11.46	2.2	197.57	Sep-14	9.66	-4.3	166.54
Oct-10	11.51	0.4	198.41	Oct-14	8.77	-9.3	151.13
Nov-10	10.86	-5.6	187.20	Nov-14	8.36	-4.6	144.16
Dec-10	10.72	-1.3	184.79	Dec-14	7.96	-4.9	137.15
Jan-11	10.84	1.1	186.89	Jan-15	8.01	0.7	138.15
Feb-11	11.21	3.4	193.30	Feb-15	8.02	0.1	138.29
Mar-11	12.07	7.6	208.04	Mar-15	8.32	3.7	143.44
Apr-11	13.30	10.2	229.22	Apr-15	9.00	8.2	155.13
May-11	12.01	-9.7	207.04	May-15	8.39	-6.8	144.58
Jun-11	12.25	2.0	211.20	Jun-15	8.01	-4.5	138.12
Jul-11	12.72	3.9	219.34	Jul-15	7.56	-5.7	130.25
Aug-11	12.64	-0.7	217.84	Aug-15	7.38	-2.4	127.15
Sep-11	11.43	-9.6	196.95	Sep-15	6.60	-10.5	113.78
Oct-11	11.09	-3.0	191.10	Oct-15	6.70	1.5	115.43
Nov-11	10.70	-3.4	184.52	Nov-15	7.08	5.8	122.08
Dec-11	10.04	-6.2	173.00	Dec-15	6.76	-4.5	116.56
Jan-12	10.20	1.7	175.90	Jan-16	6.42	-5.1	110.63
Feb-12	10.76	5.4	185.45	Feb-16	6.73	4.8	115.98
Mar-12	10.55	-2.0	181.82	Mar-16	7.79	15.8	134.33
Apr-12	10.45	-1.0	180.06	Apr-16	8.30	6.5	143.05
May-12	9.64	-7.7	166.20	May-16	7.28	-12.3	125.43
Jun-12	9.37	-2.9	161.44	Jun-16	7.16	-1.5	123.51
Jul-12	9.76	4.2	168.16	Jul-16	7.46	4.2	128.64
Aug-12	10.17	4.3	175.33	Aug-16	7.33	-1.7	126.41
Sep-12	10.30	1.3	177.54	Sep-16	6.35	-13.3	109.53
Oct-12	10.13	-1.6	174.66	Oct-16	5.88	-7.5	101.35
Nov-12	9.84	-2.8	169.69	Nov-16	5.00	-14.9	86.21
Dec-12	9.73	-1.1	167.74	Dec-16	5.47	9.4	94.32
Jan-13	10.11	3.9	174.31	Jan-17	7.32	33.8	126.20
Feb-13	10.79	6.7	185.96	Feb-17	9.85	34.6	169.85
Mar-13	11.14	3.3	192.04	Mar-17	10.38	5.3	178.90
Apr-13	10.95	-1.7	188.71	Apr-17	9.52	-8.3	164.05
May-13	10.40	-5.0	179.31	May-17	8.75	-8.0	150.90
Jun-13	9.49	-8.8	163.61	Jun-17	8.18	-6.5	141.04
Jul-13	9.65	1.7	166.41				
Aug-13	9.80	1.5	168.95				
Sep-13	10.21	4.2	176.02				
Oct-13	10.17	-0.4	175.28				
Nov-13	9.29	-8.6	160.18				
Dec-13	8.91	-4.1	153.63				

*Weighted average and quoted in US\$ per metric ton
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

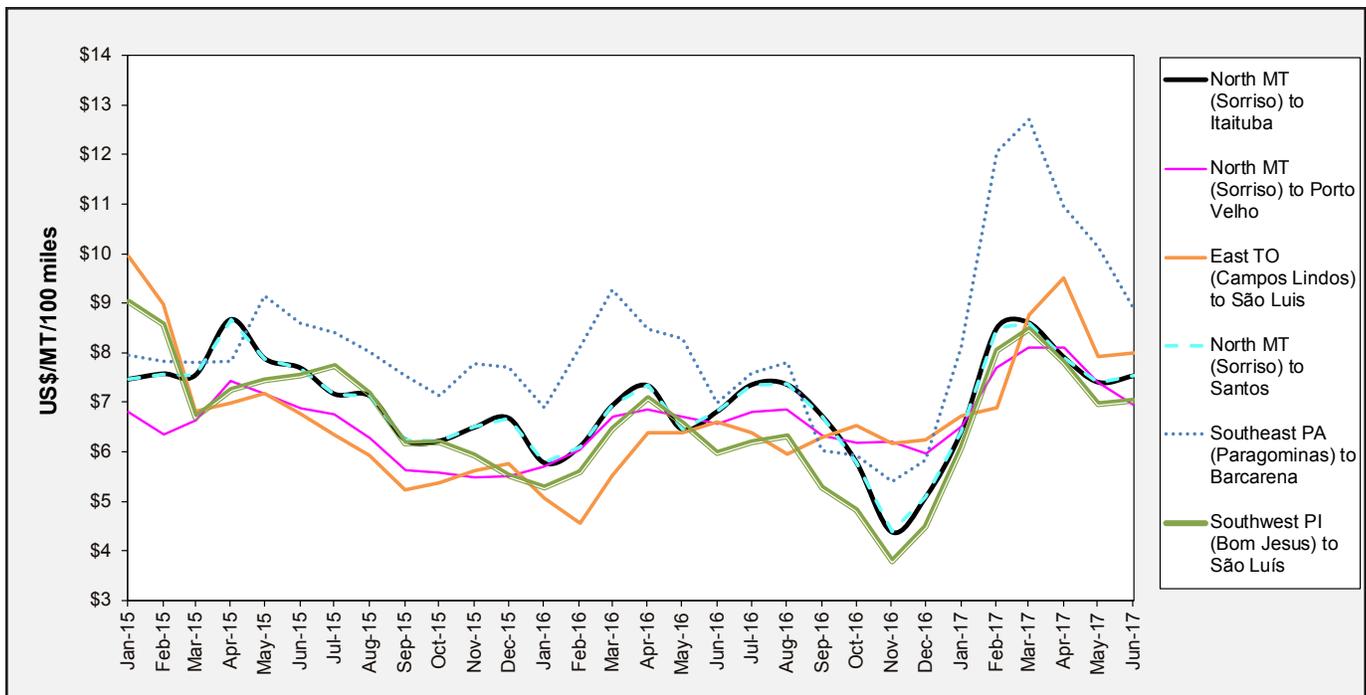


Figure 3. Truck rates for selected southern Brazilian soybean export transportation route



Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

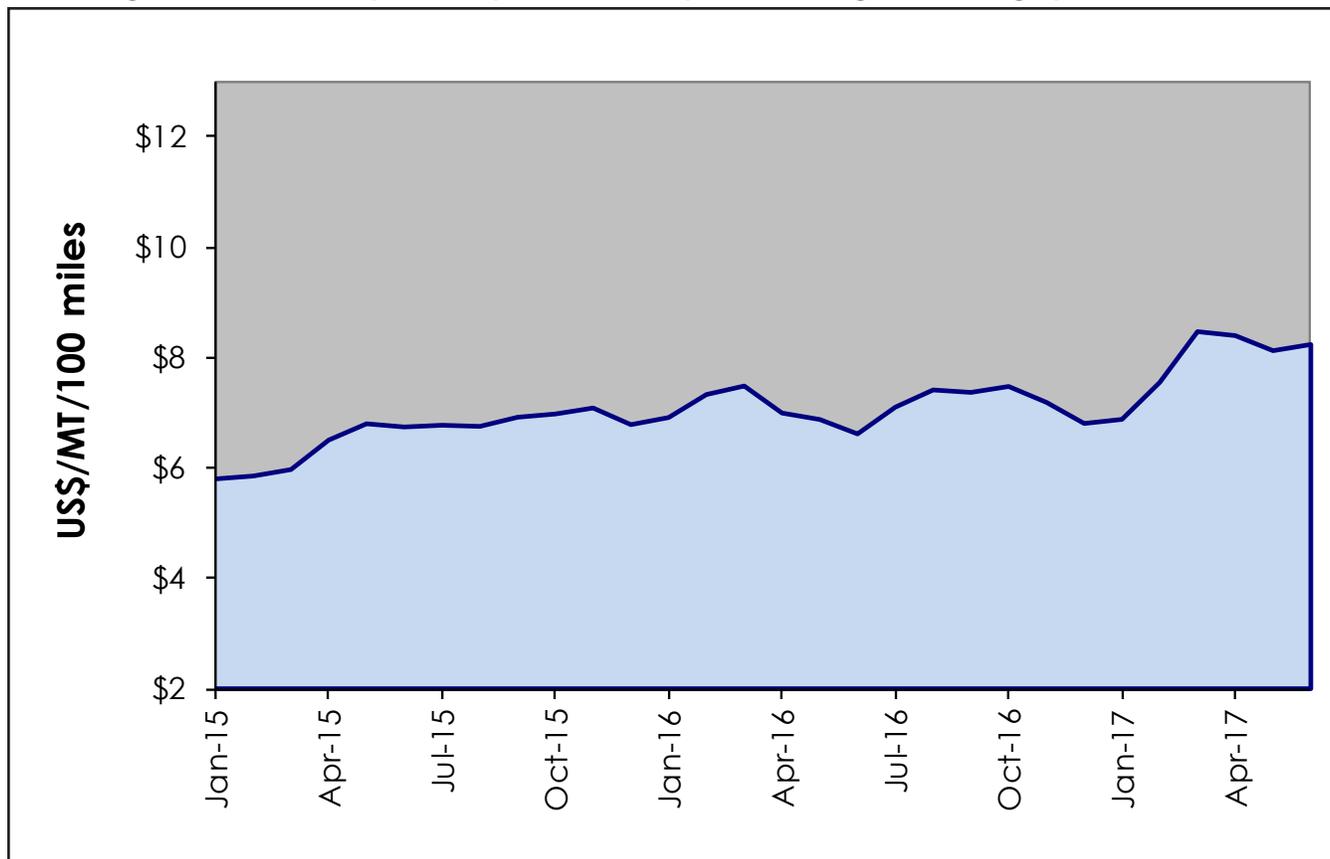
Figure 4. Truck rates for selected north and northeastern Brazilian soybean export transportation route



Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



Figure 5. Brazilian soybean export truck transportation weighted average prices, 2015/17



Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS



Table 11. Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Germany and China (US\$/metric ton)*

Port	Destination	1st qtr 2010	2nd qtr 2010	3rd qtr 2010	4th qtr 2010
Santos	Germany (Hamburg)	32.25	36.17	34.42	31.67
Paranagua	Germany (Hamburg)	31.83	38.08	36.92	33.50
Rio Grande	Germany (Hamburg)	33.50	39.00	37.08	34.54
Santos	China (Shanghai)	52.33	55.08	58.17	57.79
Paranagua	China (Shanghai)	52.50	58.58	63.10	61.50
Rio Grande	China (Shanghai)	53.00	58.75	63.27	57.83
Port	Destination	1st qtr 2011	2nd qtr 2011	3rd qtr 2011	4th qtr 2011
Santos	Germany (Hamburg)	34.96	35.00	36.65	32.00
Paranagua	Germany (Hamburg)	33.86	36.00	37.29	32.63
Rio Grande	Germany (Hamburg)	35.43	36.00	37.81	35.22
Santos	China (Shanghai)	50.00	50.05	52.31	49.65
Paranagua	China (Shanghai)	56.25	57.62	59.61	55.80
Rio Grande	China (Shanghai)	50.50	50.60	53.02	50.26
Port	Destination	1st qtr 2012	2nd qtr 2012	3rd qtr 2012	4th qtr 2012
Santos	Germany (Hamburg)	32.00	35.00	32.00	28.00
Paranagua	Germany (Hamburg)	31.58	35.00	34.30	34.30
Rio Grande	Germany (Hamburg)	32.08	36.50	32.00	32.00
Santos	China (Shanghai)	46.62	51.35	50.42	50.42
Paranagua	China (Shanghai)	52.32	57.63	55.42	55.42
Rio Grande	China (Shanghai)	47.92	52.78	49.02	49.02
Port	Destination	1st qtr 2013	2nd qtr 2013	3rd qtr 2013	4th qtr 2013
Santos	Germany (Hamburg)	30.00	29.00	29.00	30.00
Paranagua	Germany (Hamburg)	30.00	29.00	29.00	30.00
Rio Grande	Germany (Hamburg)	30.00	29.00	29.00	30.00
Santos	China (Shanghai)	52.34	34.50	34.50	42.50
Paranagua	China (Shanghai)	56.03	36.75	36.75	46.00
Rio Grande	China (Shanghai)	51.34	35.25	35.25	44.25
Port	Destination	1st qtr 2014	2nd qtr 2014	3rd qtr 2014	4th qtr 2014
Santos	Germany (Hamburg)	31.00	30.00	26.00	24.00
Paranagua	Germany (Hamburg)	31.00	30.00	28.00	26.00
Rio Grande	Germany (Hamburg)	31.00	30.00	24.50	22.50
Santos	China (Shanghai)	44.83	38.07	34.00	30.50
Paranagua	China (Shanghai)	47.22	41.13	36.00	32.50
Rio Grande	China (Shanghai)	44.83	38.75	32.50	30.50

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volume

Source: Sistema de Informações de Fretes, SIFRECA, ESALQ/USP (University of São Paulo, Brazil)

(Continued on following page)



Table 11. Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Germany and China (continued) (US\$/metric ton)*

Port	Destination	1st qtr 2015	2nd qtr 2015	3rd qtr 2015	4th qtr 2015
Santos	Germany (Hamburg)	22.00	21.00	19.00	17.00
Paranaguá	Germany (Hamburg)	22.00	21.00	19.00	17.00
Rio Grande	Germany (Hamburg)	22.00	21.00	19.00	17.00
Santarém	Germany (Hamburg)	20.00	14.50	13.50	20.00
São Luís	Germany (Hamburg)	20.00	18.25	16.38	20.50
Barcarena	Germany (Hamburg)	20.00	16.00	15.20	21.00
Santos	China (Shanghai)	29.50	22.50	23.25	20.00
Paranagua	China (Shanghai)	31.50	23.50	24.18	20.50
Rio Grande	China (Shanghai)	29.50	25.00	25.75	21.00
Santarém	China (Shanghai)	32.00	25.00	25.75	23.50
São Luís	China (Shanghai)	32.00	25.00	25.75	23.50
Barcarena	China (Shanghai)	32.00	25.00	25.75	23.50
Port	Destination	1st qtr 2016	2nd qtr 2016	3rd qtr 2016	4th qtr 2016
Santos	Germany (Hamburg)	16.00	17.00	16.50	23.00
Paranaguá	Germany (Hamburg)	16.00	17.00	16.50	24.00
Rio Grande	Germany (Hamburg)	16.00	17.00	16.50	23.00
Santarém	Germany (Hamburg)	11.03	14.13	15.00	19.80
São Luís	Germany (Hamburg)	8.25	11.00	11.80	15.80
Barcarena	Germany (Hamburg)	9.60	12.45	13.20	17.35
Santos	China (Shanghai)	17.50	16.50	12.50	20.00
Paranagua	China (Shanghai)	18.00	18.50	14.50	21.50
Rio Grande	China (Shanghai)	18.50	17.00	13.00	20.50
Santarém	China (Shanghai)	22.00	21.00	19.40	23.75
São Luís	China (Shanghai)	20.00	18.40	17.50	22.00
Barcarena	China (Shanghai)	22.50	21.50	20.00	23.75
Port	Destination	1st qtr 2017	2nd qtr 2017	3rd qtr 2017	4th qtr 2017
Santos	Germany (Hamburg)	21.00	24.00		
Paranaguá	Germany (Hamburg)	22.00	25.00		
Rio Grande	Germany (Hamburg)	22.00	25.00		
Santarém	Germany (Hamburg)	21.00	23.60		
São Luís	Germany (Hamburg)	17.60	20.00		
Barcarena	Germany (Hamburg)	18.00	20.60		
Santos	China (Shanghai)	18.50	29.00		
Paranagua	China (Shanghai)	20.50	30.50		
Rio Grande	China (Shanghai)	18.00	29.50		
Santarém	China (Shanghai)	24.00	33.50		
São Luís	China (Shanghai)	23.50	30.25		
Barcarena	China (Shanghai)	24.00	33.50		

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volume

Source: Sistema de Informações de Fretes, SIFRECA, ESALQ/USP (University of São Paulo, Brazil)



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Data Sets:

- ◆ [Figure 1a. Brazil average monthly soybean exports \(XLS\)](#)
- ◆ [Figure 1b. Brazil soybean exports by port, January-July 2017 \(XLS\)](#)
- ◆ [Figure 3: Truck rates for selected Brazilian soybean export transportation route \(XLS\)](#)
- ◆ [Figure 4: Truck rates for selected north and northeastern Brazilian soybean export transportation route \(XLS\)](#)
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- ◆ [Table 11: Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Germany and China \(US\\$/metric ton\) \(XLS\)](#)



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