Brazil Soybean Transportation

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Transportation Costs Declined. Second quarter 2008 Brazilian soybean transportation costs as a percentage of landed cost declined 28−49 percent compared with the 2nd quarter of 2007 (see tables 1, 2, 3, and 4). Truck rates increased up to 40 percent in Mato Grosso (MT), but this was not enough to offset the significant decline in ocean rates. Ocean rates to Shanghai dropped 35 percent and those to Hamburg dropped 19 percent. Producers stored their soybeans during the peak of the harvest (March−April), hoping for higher prices, and sold their product during the second quarter, especially in the states of MT and Mato Grosso do Sul (MS). These two states account for 37 percent of Brazil soybean production. The delay in soybean sales to the 2nd quarter caused an overlap with the corn, wheat, and rice harvests, resulting in a 12−40 percent boost in truck rates. Even though soybean prices nearly doubled in MT, producers did not realize the benefits of the increase in farm prices due to high debt and rising production and transportation costs (SIFRECA).

Table 1. Quarterly costs of transporting Brazilian soybeans to Shanghai, China

	2007 2nd qtr	2008 2nd qtr	% Change	2007 2nd qtr	2008 2nd qtr	% Change
	North MT[1] - Santos[2] --US$/mt--			Northwest RS[1] - Rio Grande[2] --US$/mt--		
Truck	90.57	127.04	40.27	25.22	28.40	12.61
Ocean	111.20	71.99	-35.27	109.70	72.30	-34.10
Total transportation	201.77	199.03	-1.36	134.92	100.70	-25.37
Farm value[3]	198.61	389.20	95.97	228.00	429.72	88.48
Landed cost	400.38	588.23	46.92	362.92	530.42	46.15
Transport % of landed cost	50.4	33.8	-32.9	37.2	19.0	-48.9
	North Center PR[1] - Paranagua[2] --US$/mt--			South GO[1] - Santos[2] --US$/mt--		
Truck	36.51	36.02	-1.33	48.80	62.34	27.74
Ocean	110.20	71.93	-34.72	111.20	71.99	-35.27
Total transportation	146.71	107.95	-26.41	160.00	134.33	-16.05
Farm value[3]	239.48	434.42	81.40	225.49	401.89	78.23
Landed cost	386.19	542.37	40.44	385.49	536.22	39.10
Transport % of landed cost	38.0	19.9	-47.6	41.5	25.1	-39.6

[1]Producing regions: RS = Rio Grande Do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

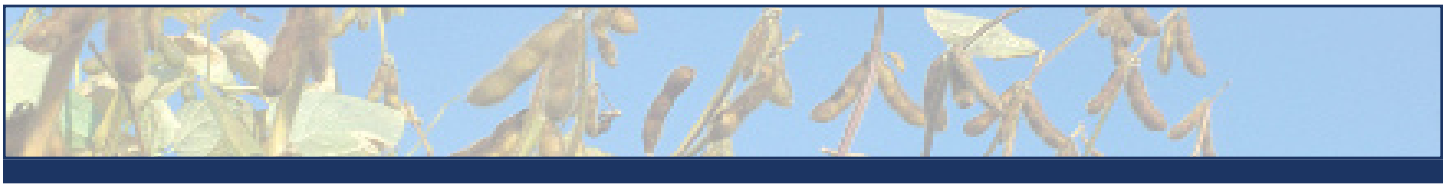
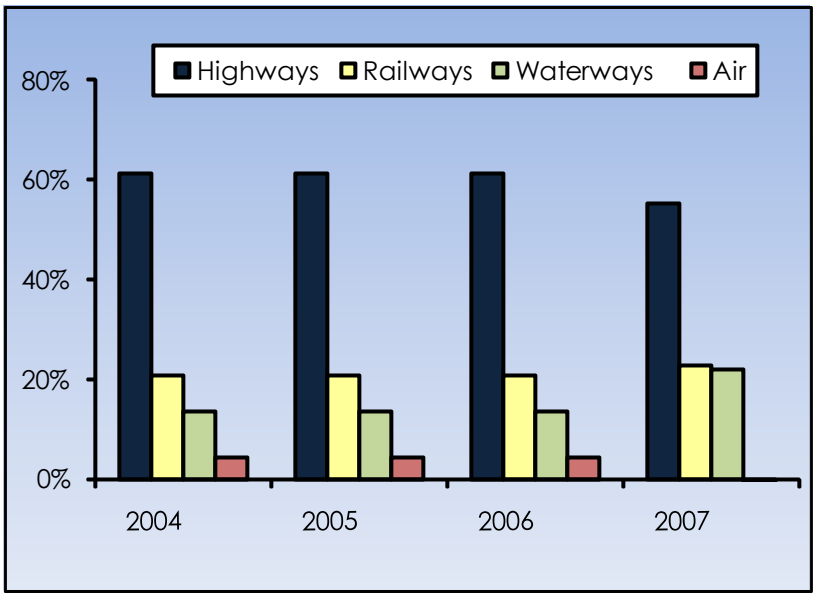


Figure 1. Modal share for Brazil's general cargo



Source: Confederação Nacional do Transporte (CNT)

Brazil's Modal Share for General Cargo. During 2007, trucks were the largest cargo transportation mode in Brazil, accounting for 55 percent of cargo moved (Confederação Nacional do Transporte (CNT)). Railways and barges shipped 23 and 22 percent. Truck shipments declined 9.5 percent, from 61 to 55. Barge shipments increased 61 percent, from 14 to 22. Even though there was a significant increase in Brazilian barge cargo movement, it still represents only 23 percent of the potential 26,553 navigable Brazilian waterway miles. The Brazilian river system consists of 17,000 actual navigable miles and 9,553 of potential navigable miles (Agência Nacional de Transportes Aquaviários (ANTAQ)). Development of the potential waterway system is limited due to differences in depth, navigation route length, the curve radius of various rivers, currents, waterfalls, dams, and locks.

Table 2. Quarterly costs of transporting Brazilian soybeans to Hamburg, Germany

	2007 2nd qtr	2008 2nd qtr	% Change	2007 2nd qtr	2008 2nd qtr	% Change
	North MT[1] - Santos[2] --US$/mt--			Northwest RS[1] - Rio Grande[2] --US$/mt--		
Truck	90.57	127.04	40.27	25.22	28.40	12.61
Ocean	91.61	74.09	-19.12	90.11	82.71	-8.21
Total transportation	182.18	201.13	10.40	115.33	111.11	-3.66
Farm value[3]	198.61	389.20	95.97	228.00	429.72	88.48
Landed cost	380.79	590.33	55.03	343.32	540.83	57.53
Transport % of landed cost	47.8	34.1	-28.8	33.6	20.5	-38.8
	North Center PR[1] - Paranagua[2] --US$/mt--			South GO[1] - Santos[2] --US$/mt--		
Truck	36.51	36.02	-1.33	48.80	62.34	27.74
Ocean	90.61	84.47	-6.78	91.61	74.09	-19.12
Total transportation	127.11	120.49	-5.21	140.41	136.43	-2.83
Farm value[3]	239.48	434.42	81.40	225.49	401.89	78.23
Landed cost	366.59	554.91	51.37	365.90	538.32	47.12
Transport % of landed cost	34.7	21.7	-37.4	38.4	25.3	-34.0

[1]Producing regions: RS = Rio Grande Do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Brazilian railway tracks extend 17,875 miles (Agência Nacional de Transportes Terrestres (ANTT)). However, the gauge size (distance between the rails) varies by region. This variation in gauge size complicates the regional integration of the railway system by reducing efficiency, since cargo has to be transferred to different freight cars between regions (CNT). There are 3 types of gauge: metric (39"), wide (63'') and mixed, a combination of the metric and the wide, (39"–63"). The metric gauge accounts for 81 percent of total Brazilian railroad miles, and predominates in the northeast and southern regions. The wide gauge accounts for 17 percent of the total railroad miles and prevails in the southeast region. North American railroads (Canada, United States, and Mexico) operate over 173,000 miles of track (Association of American Railroads (AAR)) with a standard gauge size of 56.5 inches. Gauge uniformity facilitates railroad integration throughout North America, increasing transportation efficiency in the region.

The Brazilian Highway system extends 993,941 miles, but only 88 percent are paved. The 2007 CNT survey of the highway system indicates that one third of the roads are not in an acceptable condition. For more information see the *Soybean Transportation Guide: Brazil 2007* or contact Delmy Salin at delmy.salin@usda.gov.

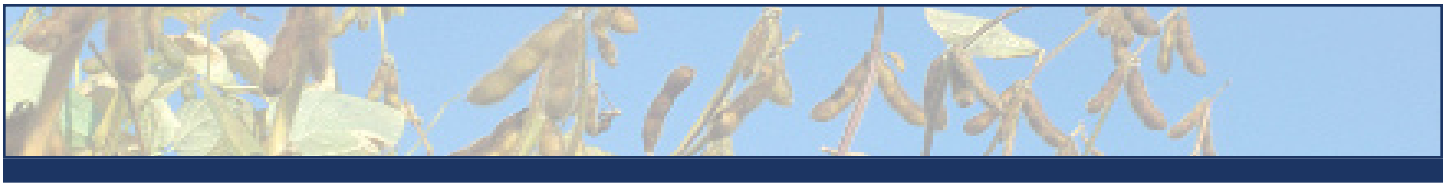
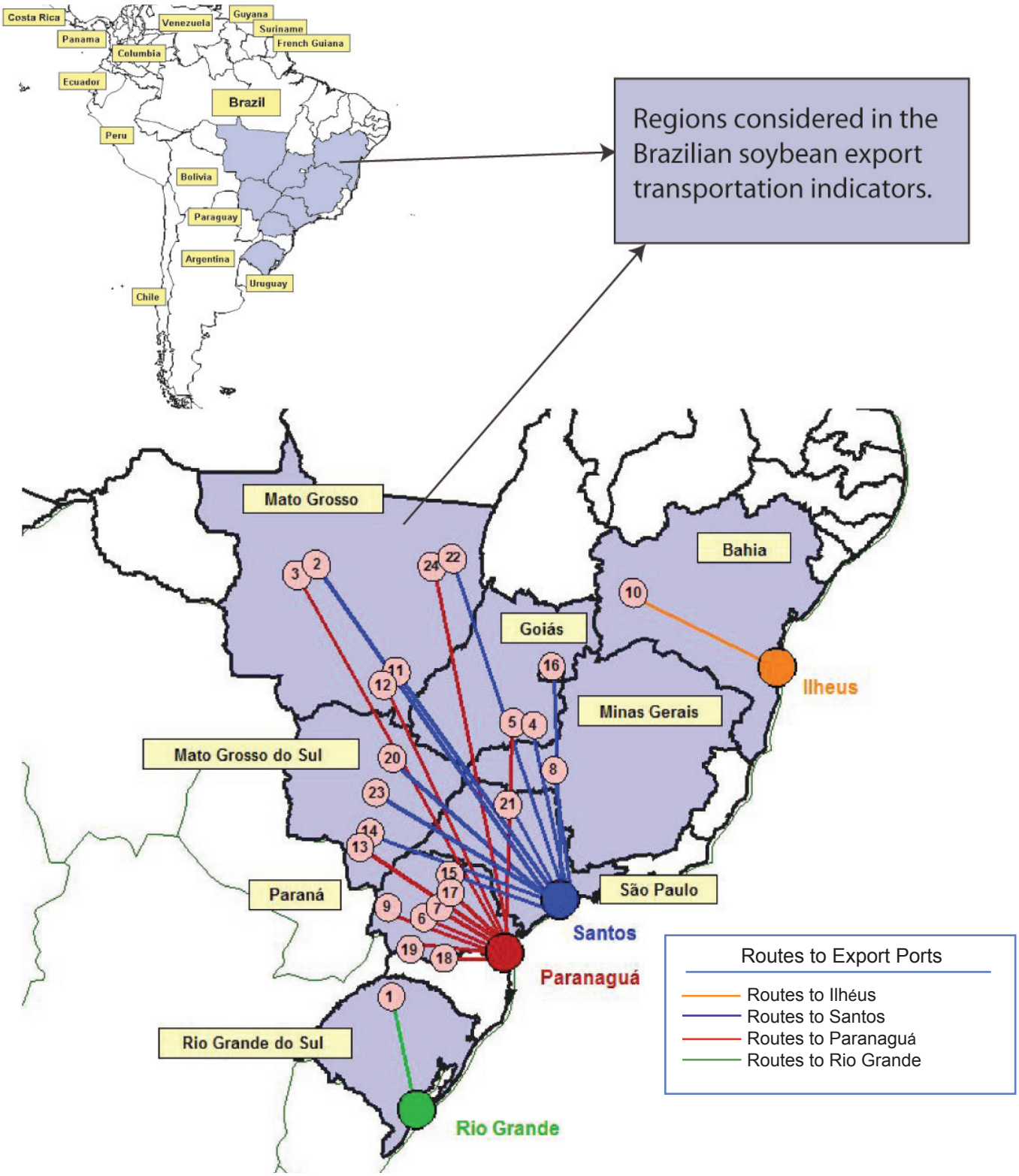


Figure 2. Routes[1] and regions considered in the Brazilian soybean export transportation indicator[2]



[1]Table defining routes by number is shown on page 6
[2]Regions comprised about 82 percent of Brazilian soybean production, 2006
Source: USDA/AMS & ESALQ - University of São Paulo (USP), Brazil

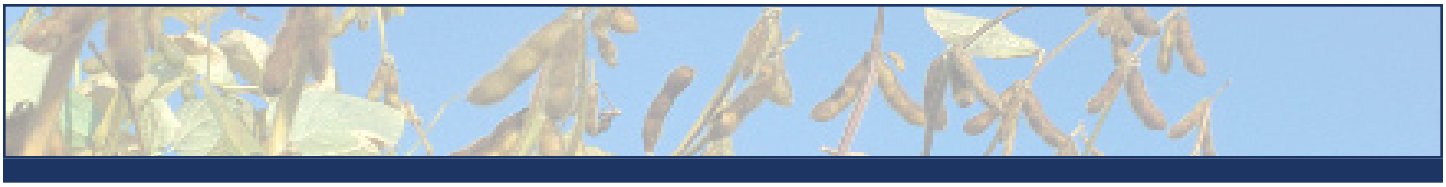


Table 3. Quarterly costs of transporting Brazilian soybeans to Shanghai, China								
	----------2008----------							
	1st qtr	2nd qtr	3rd qtr	4th qtr	1st qtr	2nd qtr	3rd qtr	4th qtr
	North MT[1] - Santos[2] --US$/mt--				North MT[1] - Paranagua[2] --US$/mt--			
Truck	117.44	127.04			110.47	120.77		
Ocean	70.57	71.99			69.17	71.93		
Total transportation	188.01	199.03			179.64	192.71		
Farm value[3]	349.23	389.20			349.23	389.20		
Landed cost	537.25	588.23			528.87	581.91		
Transport % of landed cost	35.0	33.8			34.0	33.1		
	Southeast MT[1] - Santos[2] --US$/mt--				North Center PR[1] - Paranagua[2] --US$/mt--			
Truck	79.40	85.79			35.65	36.02		
Ocean	70.57	71.99			69.17	71.93		
Total transportation	149.97	157.78			104.82	107.95		
Farm value[3]	349.23	389.20			423.63	434.42		
Landed cost	499.20	546.98			528.45	542.37		
Transport % of landed cost	30.0	28.8			19.8	19.9		
	South GO[1] - Santos[2] --US$/mt--				Northwest RS[1] - Rio Grande[2] --US$/mt--			
Truck	56.78	62.34			19.32	28.40		
Ocean	70.57	71.99			70.89	72.30		
Total transportation	127.35	134.33			90.21	100.70		
Farm value[3]	406.90	401.89			404.89	429.72		
Landed cost	534.26	536.22			495.10	530.42		
Transport % of landed cost	23.8	25.1			18.2	19.0		

[1]Producing regions: RS = Rio Grande Do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

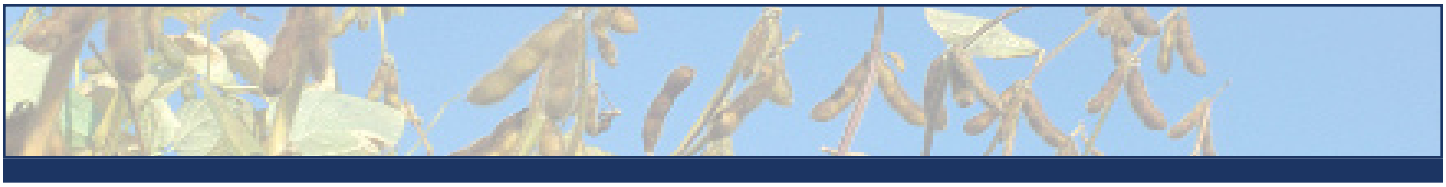


Table 4. Quarterly costs of transporting Brazilian soybeans to Hamburg, Germany								
	----------2008----------							
	1st qtr	2nd qtr	3rd qtr	4th qtr	1st qtr	2nd qtr	3rd qtr	4th qtr
	North MT[1] - Santos[2] --US$/mt--				North MT[1] - Paranagua[2] --US$/mt--			
Truck	117.44	127.04			110.47	120.77		
Ocean	72.00	74.09			70.54	84.47		
Total transportation	189.44	201.13			181.01	205.24		
Farm value[3]	349.23	389.20			349.23	389.20		
Landed cost	538.67	590.33			530.24	594.44		
Transport % of landed cost	35.2	34.1			34.1	34.5		
	Southeast MT[1] - Santos[2] --US$/mt--				North Center PR[1] - Paranagua[2] --US$/mt--			
Truck	79.40	85.79			35.65	36.02		
Ocean	72.00	74.09			70.54	84.47		
Total transportation	151.40	159.88			106.19	120.49		
Farm value[3]	349.23	389.20			423.63	434.42		
Landed cost	500.63	549.09			529.82	554.91		
Transport % of landed cost	30.2	29.1			20.0	21.7		
	South GO[1] - Santos[2] --US$/mt--				Northwest RS[1] - Rio Grande[2] --US$/mt--			
Truck	56.78	62.34			19.32	28.40		
Ocean	72.00	74.09			70.79	82.71		
Total transportation	128.78	136.43			90.11	111.11		
Farm value[3]	406.90	401.89			404.89	429.72		
Landed cost	535.69	538.32			495.00	540.83		
Transport % of landed cost	24.0	25.3			18.2	20.5		

[1]Producing regions: RS = Rio Grande Do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Table 5. Truck rates for selected Brazilian soybean export transportation routes, 2008

Route #	Origin[1] (reference city)	Destination	Distance (miles)[2]	Share (%)[3]	Freight Price (US$) 1st qtr	2nd qtr
					--- (per 100 miles)[4]---	
1	Northwest RS(Cruz Alta)	Rio Grande	288	3.23	6.71	9.86
2	North MT(Sorriso)	Santos	1190	14.34	9.87	10.68
3	North MT(Sorriso)	Paranaguá	1262	13.52	8.75	9.57
4	South GO(Rio Verde)	Santos	587	7.17	9.67	10.62
5	South GO(Rio Verde)	Paranaguá	726	5.80	7.78	8.76
6	North Center PR(Londrina)	Paranaguá	268	3.69	13.30	13.44
7	Western Center PR(Mamborê)	Paranaguá	311	3.35	9.06	10.96
8	Triangle MG(Uberaba)	Santos	339	4.39	13.61	15.04
9	West PR(Assis Chateaubriand)	Paranaguá	377	3.36	8.35	10.07
10	West Extreme BA(São Desidério)	Ilhéus	544	5.50	10.50	12.47
11	Southeast MT(Primavera do Leste)	Santos	901	3.93	8.81	9.52
12	Southeast MT(Primavera do Leste)	Paranaguá	975	3.64	7.84	8.87
13	Southwest MS(Maracaju)	Paranaguá	612	2.71	8.50	8.52
14	Southwest MS(Maracaju)	Santos	652	2.54	8.21	8.55
15	West PR(Assis Chateaubriand)	Santos	550	2.30	10.23	11.14
16	East GO(Cristalina)	Santos	585	2.09	11.29	11.78
17	North PR(Cornélio Procópio)	Paranaguá	306	1.61	10.44	9.40
18	Eastern Center PR(Castro)	Paranaguá	130	2.37	15.78	14.87
19	South Center PR(Guarapuava)	Paranaguá	204	1.84	14.38	15.69
20	North Center MS (São Gabriel do Oeste)	Santos	720	1.92	7.78	8.51
21	Ribeirão Preto SP(Guairá)	Santos	314	1.40	11.48	12.66
22	Northeast MT(Canarana)	Santos	950	2.21	10.70	12.09
23	East MS(Chapadão do Sul)	Santos	607	1.37	8.66	10.34
24	Northeast MT(Canarana)	Paranaguá	1075	1.95	9.30	10.14
25	Western Center RS(Tupanciretã)	Rio Grande	273	2.36	12.48	13.01
26	Southwest PR(Chopinzinho)	Paranaguá	291	1.41	12.38	12.89
Weighted average				**100.00**	**9.87**	**10.84**

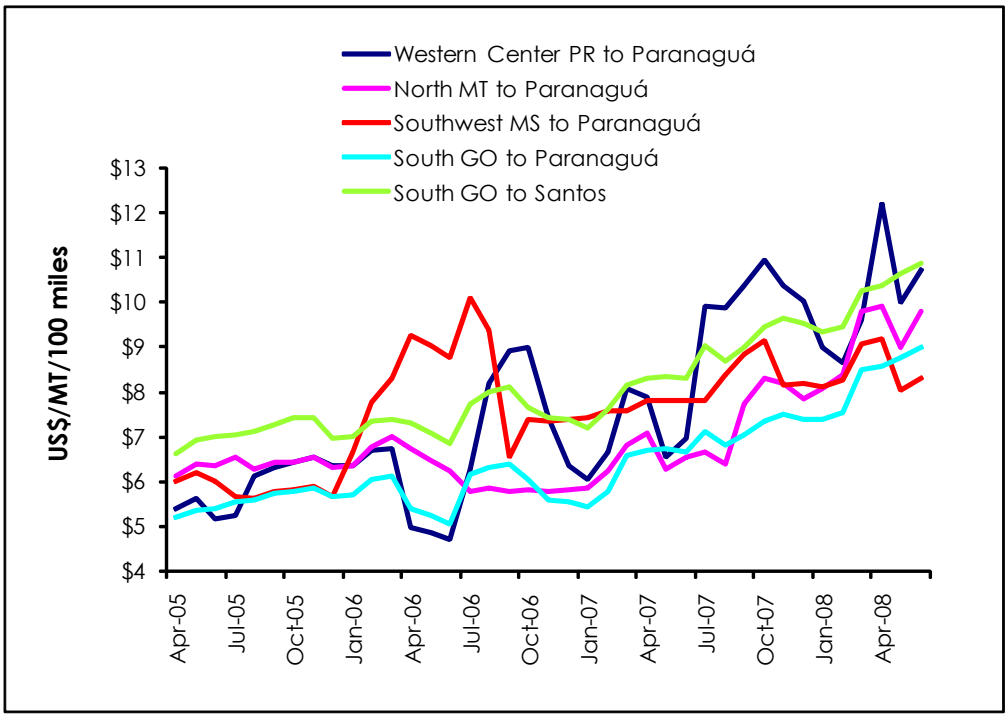
[1]Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available
[2]Distance from the main city of the considered region to the mentioned ports
[3]Share is measured as a percentage of total production
[4]US$ per metric ton (average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollar)
[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
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Table 6. 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)
Jan-05	5.80	40.8	100.00
Feb-05	5.85	0.9	100.90
Mar-05	5.97	2.0	102.92
Apr-05	6.51	9.0	112.14
May-05	6.80	4.5	117.22
Jun-05	6.74	-0.9	116.22
Jul-05	6.77	0.5	116.76
Aug-05	6.75	-0.3	116.41
Sep-05	6.92	2.5	119.27
Oct-05	6.98	0.9	120.28
Nov-05	7.09	1.6	122.15
Dec-05	6.78	-4.3	116.95
Jan-06	6.91	1.9	119.18
Feb-06	7.33	6.0	126.36
Mar-06	7.48	2.1	129.02
Apr-06	6.99	-6.6	120.57
May-06	6.88	-1.7	118.56
Jun-06	6.62	-3.8	114.05
Jul-06	7.10	7.3	122.41
Aug-06	7.41	4.4	127.79
Sep-06	7.37	-0.6	127.02
Oct-06	7.48	1.5	128.88
Nov-06	7.19	-3.8	123.92
Dec-06	6.81	-5.3	117.32
Jan-07	6.88	1.1	118.60
Feb-07	7.55	9.7	130.15
Mar-07	8.47	12.2	146.00
Apr-07	8.40	-0.9	144.76
May-07	8.12	-3.3	140.05
Jun-07	8.24	1.4	141.99
Jul-07	9.00	9.3	155.20
Aug-07	8.63	-4.2	148.75
Sep-07	9.23	6.9	159.05
Oct-07	9.72	5.4	167.61
Nov-07	9.56	-1.6	164.86
Dec-07	9.32	-2.5	160.71
Jan-08	9.40	0.9	162.12
Feb-08	9.63	2.4	166.02
Mar-08	10.59	9.9	182.46
Apr-08	10.81	2.1	186.35
May-08	10.69	-1.1	184.32
Jun-08	11.00	2.9	189.67

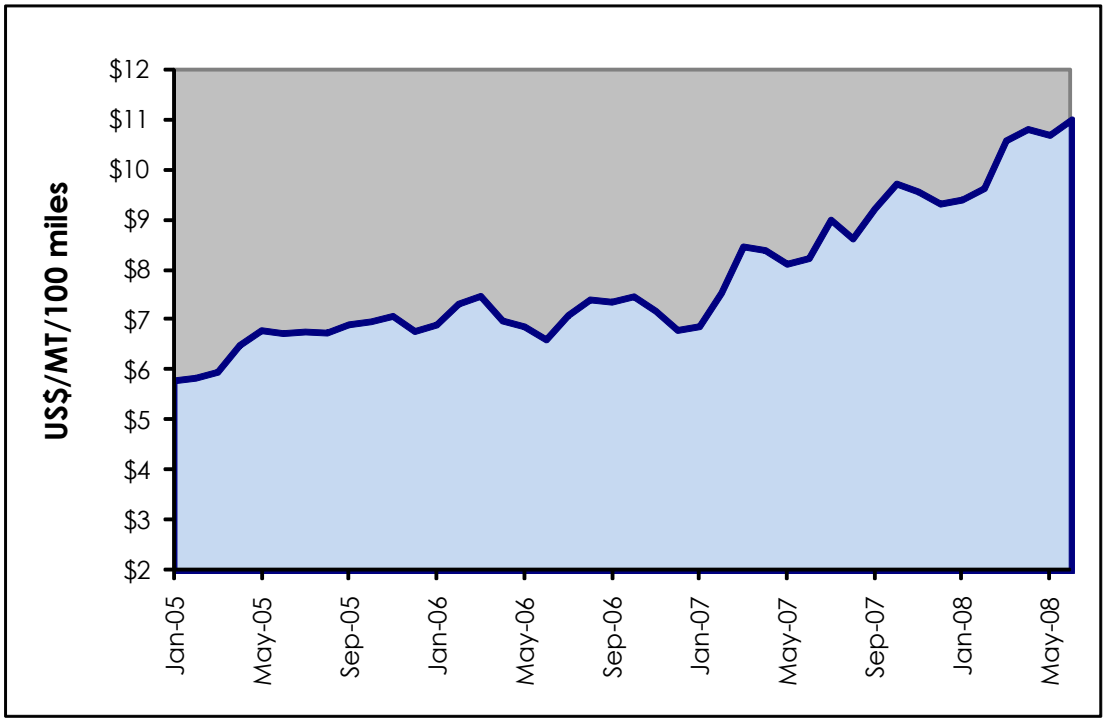
*Weighted average and quoted in US$ per metric ton
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Figure 3. Truck rates for selected Brazilian soybean export transportation routes



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

Figure 4. Brazilian soybean export truck transportation weighted average prices, 2005/08



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

Table 7. Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Germany and China (US$/metric ton)*

Port	Destination	1st qtr 2005	2nd qtr 2005	3rd qtr 2005	4th qtr 2005
Santos	Germany (Hamburg)	45.53	45.84	44.54	56.73
Paranagua	Germany (Hamburg)	44.64	44.84	43.54	55.73
Rio Grande	Germany (Hamburg)	44.20	44.39	43.04	55.23
Port	**Destination**	**1st qtr 2006**	**2nd qtr 2006**	**3rd qtr 2006**	**4th qtr 2006**
Santos	Germany (Hamburg)	39.51	36.91	50.24	60.40
Paranagua	Germany (Hamburg)	38.51	35.91	49.24	59.40
Rio Grande	Germany (Hamburg)	37.06	35.41	48.74	58.90
Santos	China (Shanghai)	50.13	44.80	60.98	73.32
Paranagua	China (Shanghai)	49.13	43.80	59.98	72.32
Rio Grande	China (Shanghai)	48.63	43.30	59.48	71.82
Port	**Destination**	**1st qtr 2007**	**2nd qtr 2007**	**3rd qtr 2007**	**4th qtr 2007**
Santos	Germany (Hamburg)	60.40	91.61	59.35	80.67
Paranagua	Germany (Hamburg)	59.40	90.61	53.12	81.08
Rio Grande	Germany (Hamburg)	58.90	90.11	57.85	80.06
Santos	China (Shanghai)	73.32	111.20	72.00	74.81
Paranagua	China (Shanghai)	72.32	110.20	65.50	75.22
Rio Grande	China (Shanghai)	71.82	109.70	70.50	74.20
Port	**Destination**	**1st qtr 2008**	**2nd qtr 2008**	**3rd qtr 2008**	**4th qtr 2008**
Santos	Germany (Hamburg)	72.00	74.09		
Paranagua	Germany (Hamburg)	70.54	84.47		
Rio Grande	Germany (Hamburg)	70.79	82.71		
Santos	China (Shanghai)	70.57	71.99		
Paranagua	China (Shanghai)	69.17	71.93		
Rio Grande	China (Shanghai)	70.89	72.30		

*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)

Brazil Soybean Transportation Indicators

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Data Sets:

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- Figure 4: Brazilian soybean export truck transportation weighted average prices, 2005/08 (XLS)
- Table 1: Quarterly costs of transporting Brazilian soybeans to Shanghai, China (XLS)
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- Soybean Transportation Guide: Brazil 2007 (PDF)
- Prior Articles: Brazil Soybean Transportation, May 20, 2008 (PDF)
- Related Articles: Grain Transportation Report, July 3, 2008 (PDF)
- U.S. Corn, Soybean, and Wheat Quarterly Transportation Cost Indicator Reports
- Ocean Rate Bulletin

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