

Exporting Louisiana Soybeans into Matamoros, Mexico, Versus Direct Sale at Harvest in Louisiana

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Producers continually search for alternative marketing outlets that offer the potential for superior financial returns. As part of that search, the Louisiana Soybean and Feed Grains Promotion and Research Board funded a study to determine if it was economically feasible to barge soybeans on the Gulf Intracoastal Waterway into Matamoros, Mexico. Interest in Mexico as a soybean export market is generated by the fact that Mexico is and will likely continue to be a soybean-deficient country. In addition, Louisiana's geographic proximity to Mexico and access to barge transportation would appear to give Louisiana soybean producers an export advantage over their U.S. Midwest counterparts. But, are export sales to Mexico feasible for Louisiana producers? This study analyzed whether Louisiana soybean farmers could net increased profits by barging soybeans into Matamoros, Mexico, instead of selling them at harvest to local elevators.

Why Target Mexican Markets?

Matamoros was targeted as a potential market outlet for Louisiana soybeans for a number of reasons. First, it is situated just across the Rio Grande River from Brownsville, Texas, and accessible to Louisiana producers by either unit train or barge

through the Gulf Intracoastal Waterway (GIW). Barges generally offer the lowest per-unit costs, being able to transport 50,000 to 55,000 bushels per barge versus 3,333 bushels per rail car. Second, the GIW links all major Louisiana river grain elevators with Brownsville because it flows in an east-west direction throughout the length of South Louisiana and intersects all of the state's major rivers.

Are export sales to Mexico feasible for Louisiana producers?

Third, since 1994 Mexico has ranked among the top three buyers of United States soybeans. Nearly all of its soybean imports are from the United States, of which 5.83 percent entered through Matamoros. The three soybean crushing plants in Matamoros represent 7 percent of Mexico's total soybean crushing capacity. Estimates of the annual need for soybeans in Matamoros ranged from 6.8 million bushels to 21.5 million bushels or from 20 percent to 66 percent of Louisiana's 1997 soybean production. Fourth, most soybean imports entering Matamoros are being shipped more than 1,200 to 1,500 miles by unit trains from midwestern United States supply points. Distances from major Louisiana supply regions to Matamoros range from 470 to 1,087 river miles and from 541 to 765 railroad miles.

Louisiana soybean producers appear to hold an advantage for exporting to Mexico because of their close proximity to export elevators and a climate that allows early planting and harvesting. There is a sense, however, that Louisiana farmers do not reap the full benefits of these advantages because of limited marketing outlets and the sale of the crops at harvest directly to local elevators. Direct sales at harvest limit the opportunities to participate in value-added activities.

Economic Feasibility Criteria

The feasibility of Louisiana soybean exports to Mexico depends upon the difference between the prices paid by Mexican buyers and Louisiana local market prices. The difference must be greater than all the known costs of exporting, plus a risk premium. The risk premium must be large enough to make producers willing to assume the additional risk and uncertainty entailed in exporting soybeans to Mexico as contrasted to selling direct to local elevators. At any point in time, that difference is determined by the relative price relationships for soybeans in Louisiana and Matamoros, barge and rail transportation rates, associated explicit transaction costs, and implicit risk premium costs. The implicit risk premium that will encourage exports is a producer-unique number. The explicit risk premium is the difference between the price in Mexico less the sum of the local Louisiana elevator price and the explicit costs of exporting. The

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producer's export or direct sell decision is the best indicator as to whether the explicit risk premium was more than or less than the implicit risk premium.

Findings

Soybean production from 34 Louisiana parishes was assigned to eight supply regions. A parish was associated with a supply region using the criterion of minimum distance of its seat from an existing elevator with barge-loading capabilities. The supply region was the focal point in deriving sets of costs and return relations recorded in Tables 1 and 2.

Table 1 organizes the estimated costs associated with barging soybeans to Matamoros from each Louisiana supply region into four categories: assembly, barging, transloading and transshipment either by truck or by train. Total estimated assembly costs

ranged from \$0.12 to \$0.17 per bushel. The differences in assembly costs between Louisiana supply regions are primarily a reflection of differences in farm trucking costs to an elevator.

Barging cost estimates ranged from \$0.36 to \$0.48 per bushel. Between supply regions, barging costs vary with distances between elevators on the Mississippi River. Transloading and transshipment costs incurred at Brownsville are independent of the Louisiana supply region. The soybean processing plants at Matamoros are not situated on the Rio Grande River, and the soybeans must be transported inland from the border point at Brownsville. Soybeans arriving in railcars maintain their origin integrity (in the form of railcar seals at the point of loading) and thus do not have to incur any of the transactions cost associated with weighing and certification. Soybeans arriving in barges,

however, must not only undergo those transactions costs, but must also undergo the transshipment costs beginning with transfer into an elevator with subsequent reloading into either trucks or rail cars for final inland shipment to Matamoros. The associated costs of elevator transfer at Brownsville were estimated at \$0.17 per bushel. Costs for transshipping grain by truck were estimated at \$0.05 per bushel, and transshipping by rail was estimated to cost \$0.09 per bushel. Therefore, the total estimated costs to transload and transship barged soybeans at Brownsville add an additional \$0.22 and \$0.26 per bushel for truck and rail, respectively.

Depending upon the specific Louisiana supply region, the total costs of exporting soybeans by barge were estimated to range from \$0.72 to \$0.84 per bushel with truck transshipment and \$0.76 to \$0.89 per bushel with rail

Table 1. Summary of Major Per Bushel Costs Components Associated With Barging Louisiana Soybeans Into Matamoros, Mexico

	LOUISIANA SUPPLY REGIONS ^a							
	Lake Providence	Tallulah	St. Joseph	Vidalia	Lettsworth	Port Allen	Krotz Springs	Mermentau
Soybean Production in Region (Bushels)	8,150,000	2,450,000	3,075,000	4,795,000	7,215,000	518,000	5,370,000	5,940,000
Number of Barge Equivalents ^b	163.0	49.0	61.5	95.5	144.3	10.4	107.4	118.8
Total Miles Barged	1,087	1,056	995	962	912	825	640	470
COSTS	DOLLARS PER BUSHEL							
Assembly Costs ^c	0.1443	\$0.1160	\$0.1409	\$0.1407	\$0.1660	\$0.1318	\$0.1426	\$0.1372
Barging Costs ^d	\$0.4790	\$0.4700	\$0.4650	\$0.4626	\$0.4588	\$0.4523	\$0.3600	\$0.3600
Transloading Costs ^e	\$0.1743	\$0.0743	\$0.1743	\$0.1743	\$0.1743	\$0.1743	\$0.1743	\$0.1743
Transshipment Costs (By Truck) ^f	\$0.0452	\$0.0452	\$0.0452	\$0.0452	\$0.0562	\$0.0542	\$0.0542	\$0.0542
Transshipment Costs (By Rail) ^g	\$0.0930	\$0.0930	\$0.0930	\$0.0930	\$0.0930	\$0.0930	\$0.0930	\$0.0930
Total Costs (Transshipment by Truck)	\$0.8428	\$0.8055	\$0.8254	\$0.8228	\$0.8443	\$0.8036	\$0.722	\$0.7167
Total Costs (Transshipment by Rail)	\$0.8906	\$0.8533	\$0.8723	\$0.8706	\$0.8921	\$0.8514	\$0.7699	\$0.7645

^a Supply regions were defined based on the shortest distances from parish seats to existing elevators with barge loading capabilities.

^b Barge equivalents are the number of barges needed to transport the supply region's total production of soybeans.

^c Assembly costs include trucking, elevator storage, barge loading, and Federal Grain Inspection Service grain inspection costs.

^d Barging costs include barging on both the Mississippi River and the Gulf Intracoastal Waterway.

^e Transloading costs include wharfage, stevedoring, elevator elevation, and weight supervision costs at Brownsville, Texas.

^f Transshipment costs by truck include trucking costs as well as costs for phytosanitary and customs paperwork.

^g Transshipment costs by rail include rail costs as well as costs for phytosanitary and customs paperwork.

transshipment. Louisiana rail direct total costs for assembly and transportation from the eight Louisiana supply regions range from \$0.75 to \$0.87 per bushel. Louisiana rail rates average \$0.71 per bushel as compared to barging costs that average \$0.42 per bushel. Although barging was cheaper than railing, the need for transloading and transshipping barged soybeans results in comparable barge and rail total per-bushel costs.

Table 2 presents 1997 cost and return relationships by Louisiana supply regions, their corresponding sets of expected gains and losses for both barge and rail shipments, the export price, and the average Louisiana price. Application of the feasibility criteria, given an estimated average export price of \$8.47 and an average Louisiana price of \$7.73, suggested that the producers from only two of the eight supply regions have a possibility

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of realizing gains from exporting soybeans. Given these prices, the magnitudes of those gains, \$0.02 per bushel, appear too small to provide the risk premium necessary to export soybeans into Matamoros. However, the relative relationships and prices determining export feasibility constantly change. Being alert to changes in those relationships is a key entrepreneurial skill.

A final consideration in assessing the potential of Matamoros as a market for Louisiana soybeans is competition from midwestern United States suppli-

ers. Currently, unit trains of soybeans from the Midwest are satisfying the demand in Mexico. If costs and returns were to make exports from Louisiana feasible, the next question is whether Louisiana could effectively compete against the current suppliers to Mexico. Unit train rates from the Midwest were reported to average about \$0.71 per bushel. Costs for Louisiana producers to export soybeans average more than \$0.80 per bushel. Therefore, Louisiana does not seem to have a competitive advantage. The costs associated with transloading and transshipping barged soybeans essentially eliminate all the economic advantages inherent in proximity and the technical efficiency of barge over rail transportation.

Implications

The value of a systems orientation in analysis of the feasibility of alterna-

Table 2. Comparison Of Per Bushel Costs and Returns Associated With Exporting Louisiana Soybeans Into Matamoros, Mexico, Versus Direct Sales in Louisiana

	LOUISIANA SUPPLY REGIONS ^a							
	Lake Providence	Talhulah	LOUISIANA \$ Joseph	Vidalia	Lettsworth	Port Allen	Krotz Springs	Mermentau
	DOLLARS			PER	BUSHEL			
1997 December Average Export Price ^b	\$8.47	\$8.47	\$8.47	\$8.47	\$8.47	\$8.47	\$8.47	\$8.47
Total Costs (Barging with Truck Transshipment) ^c	\$0.84	\$0.8	\$0.83	\$0.82	\$0.84	\$0.80	\$0.72	\$0.72
Total Costs (Barging with Rail Transshipment)	\$0.89	\$0.85	\$0.87	\$0.87	\$0.89	\$0.85	\$0.77	\$0.76
Total Costs (Rail Direct)	\$0.85	\$0.83	\$0.85	\$0.85	\$0.87	\$0.82	\$0.75	\$0.75
Net Price (Barging with Truck Transshipment) ^d	\$7.63	\$7.66	\$7.64	\$7.65	\$7.63	\$7.67	\$7.75	\$7.75
Net Price (Barging with Rail Transshipment)	\$7.58	\$7.62	\$7.60	\$7.60	\$7.58	\$7.62	\$7.70	\$7.71
Net Price (Rail Direct)	\$7.62	\$7.64	\$7.62	\$7.62	\$7.60	\$7.65	\$7.72	\$7.72
1997 December Average Louisiana Price ^e	\$7.73	\$7.73	\$7.73	\$7.73	\$7.73	\$7.73	\$7.73	\$7.73
Gain/Loss (Barging with Truck Transshipment) ^f	(\$0.10)	(\$0.07)	(\$0.09)	(\$0.08)	(\$0.10)	(\$0.06)	\$0.02	\$0.02
Gain/Loss (Barging with Rail Transshipment)	(\$0.15)	(\$0.11)	(\$0.13)	(\$0.13)	(\$0.15)	(\$0.11)	(\$0.03)	(\$0.02)
Gain/Loss (Rail Direct)	(\$0.11)	(\$0.09)	(\$0.11)	(\$0.11)	(\$0.13)	(\$0.08)	(\$0.01)	(\$0.01)

^a Supply regions were established on the basis of shortest distances from parish seats to existing elevators with barge loading capacity.

^b Export price is the average FOB Mid-Bridge Laredo price during December, 1997.

^c Costs associated with exporting soybeans by barge with either truck or rail transshipment or by rail direct.

^d Net price is the export price minus total costs.

^e Price is the average price received by producers in Louisiana during December, 1997.

^f Gain/Loss is the net price minus the average Louisiana price. Negative values suggest that sales to local Louisiana elevators are more profitable than export sales to Matamoros. Positive values suggest that it is more profitable to export soybeans rather than sell them to local Louisiana elevators.

tive marketing outlets is evident. The initial observation of this study was that proximity and a barging transportation option should economically favor the Louisiana soybean producer when exporting to Mexico. The reality was found to be different, because barging costs and opportunities for backhauls differ between water bodies, barged soybeans require transloading

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and railed soybeans do not, and institutional pricing practices create incentives and disincentives for suppliers. Analyzing only the proxim-

ity to a market, or even just a transportation method, would not have revealed all of the differences which determine feasibility. In fact, even if the economics of transportation had suggested the feasibility of export, a systems orientation would have then required an analysis of feasibility relative to the economics of storage and capacity to produce. The characteristics inherent in all three sets of economic relationships (transportation, storage, production volume) identify what is required to be a reliable supplier. Only a systems orientation can reveal whether the physical system needed to support an alternative option is also an economically viable system. Both must be feasible for the option to become a reality. In the case of Louisiana soybean exports to Matamoros, a physically viable system turned out not to be economically viable and thus not an option for Louisiana producers. ■

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