

Agricultural and Food Policy Center
Texas A&M University

November 2011

AN EXAMINATION OF US GRAIN SORGHUM TRADE FLOWS



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Texas AgriLife Research
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AgriLIFE **RESEARCH
& EXTENSION**
Texas A&M System

College Station, Texas 77843-2124
Telephone: (979) 845-5913
Fax: (979) 845-3140
<http://www.afpc.tamu.edu>

This research was funded in part by the Texas Grain Sorghum Producer Board.

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The authors' thank Dr. Stephen Fuller for his assistance.

Research Report 11-2

Agricultural and Food Policy Center
Department of Agricultural Economics
2124 TAMU
College Station, TX 77843-2124
Web site: www.afpc.tamu.edu

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David P. Ernstes
Joe L. Outlaw
Monica Irick
Brian K. Herbst



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Introduction

The United States is both a major world producer and exporter of grain sorghum (*Sorghum bicolor*). Grain sorghum is primarily utilized as a feed grain in North America. It is also used in the production of ethanol. In some regions of the World, it is also an important food crop.

This study examines the production and disposition of US grain sorghum during 2009; the most recent year with complete publicly available data. Most transportation and trade data is tracked by government agencies other than USDA. As such, this data is presented in different units than the traditional bushels and is reported on a calendar year basis rather than USDA's crop year.

For consistency, the data have been converted from metric tons, kilograms, and short tons to bushels. At the same time, this study is also limited due to disparate data collection methodologies used by different federal agencies. While some data are reported as actual values; others are sampled or estimated. These factors, with the addition of carryover stocks, the commodity being moved multiple times by different methods, and differences in methodologies for recording transportation movements result in data totals not agreeing. Consequently, the reader is cautioned to look at the components of this study in their individual context and only extrapolate the broadest of generalizations. While these data are the best available public sources, they record different things in different ways.

The 2009/10 Crop Year

As farmers began planting in the Spring of 2009, the 2009/10 grain sorghum crop year began with 55 million bushels of carryover stocks (Table 1). Farmer's planted 6.6 million acres¹ producing 383 million bushels of grain sorghum. 10 thousand bushels of grain sorghum were imported. 89 million bushels were used for food, alcohol and industrial uses. 740 thousand bushels were used for seed and 140 million bushels was used in feed or residual use. 166 million bushels were exported. The 2009/10 crop year concluded with 41 million bushels of ending stocks.

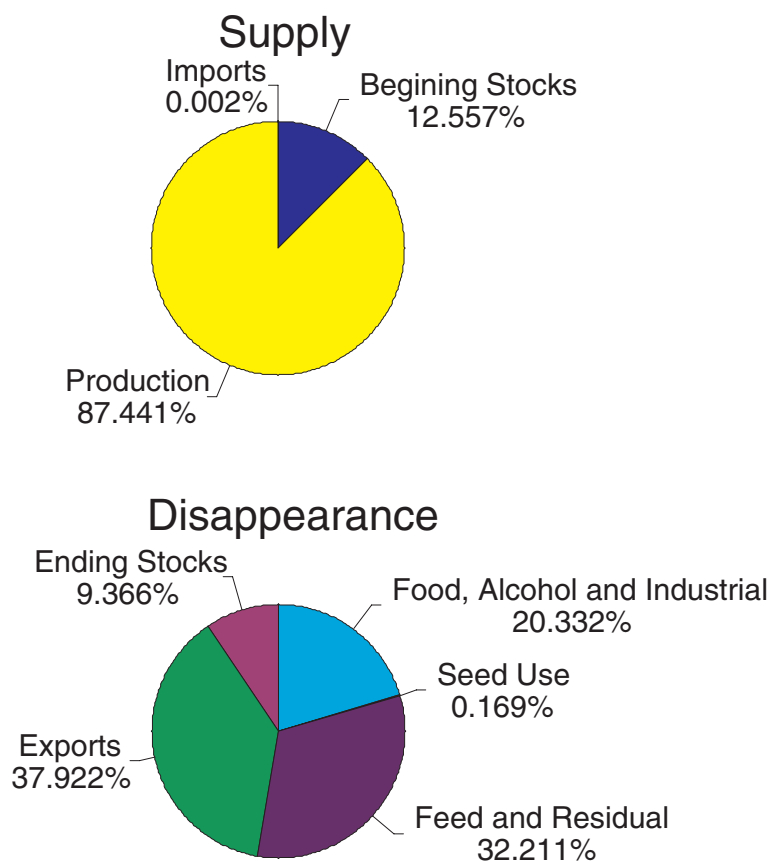
¹ National Agricultural Statistics Service. *Crop Production*. Washington, DC: USDA, National Agricultural Statistics Service, December 2010, p. 25. [Accessed 2011.] Available from <http://usda01.library.cornell.edu/usda/nass/CropProd//2010s/2010/CropProd-12-10-2010.pdf>

Table 1: Sorghum Supply and Disappearance 2009/10 Crop Year.

Supply/Disappearance (thousand bushels)	
Beginning Stocks	55,000
Production	383,000
Imports	10
Total Supply	438,000
Food, Alcohol and Industrial Use	89,000
Seed Use	740
Feed and Residual Use	140,000
Total Domestic Use	230,000
Exports	166,000
Total Disappearance	396,000
Ending Stocks	41,000

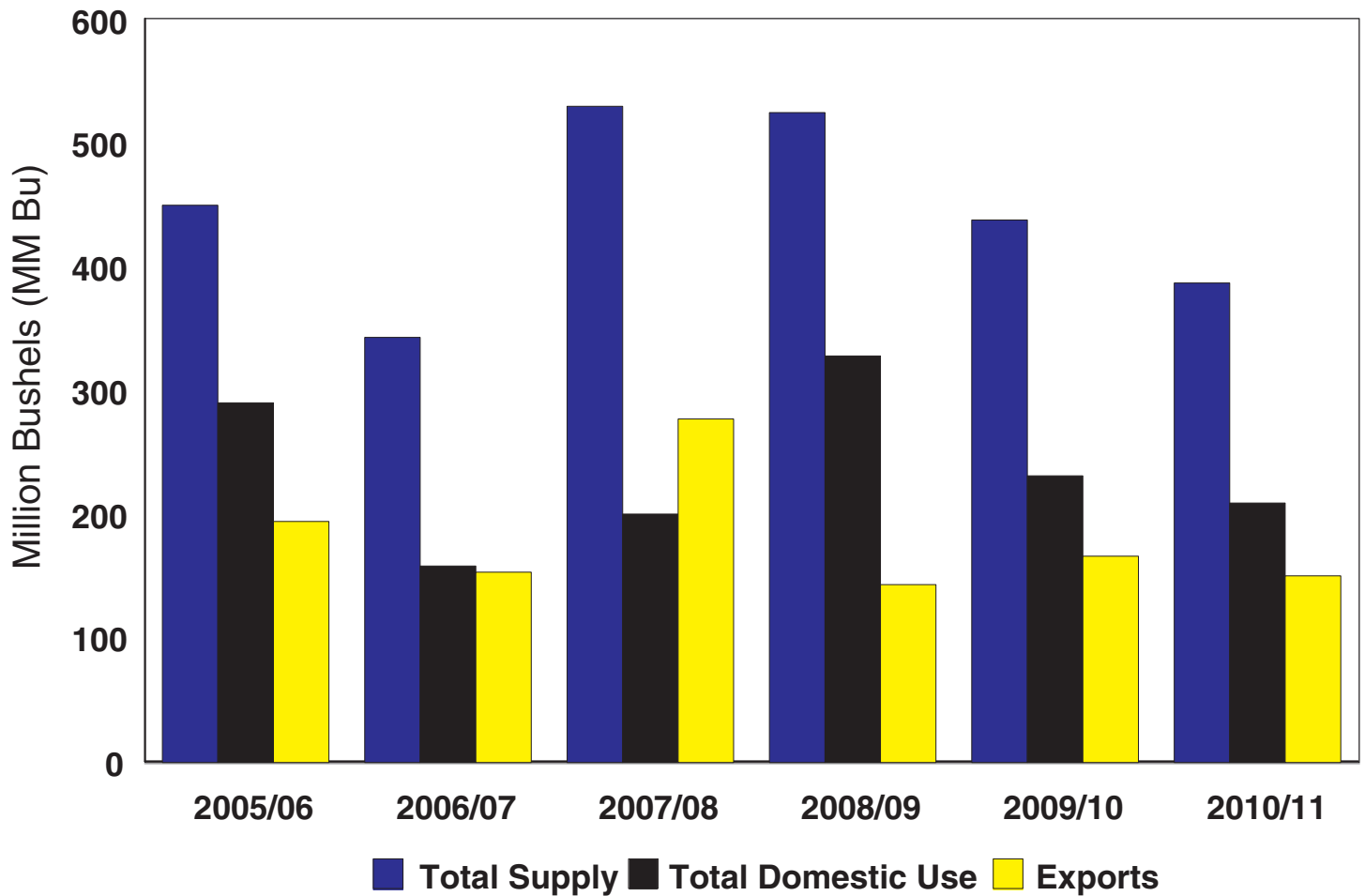
Economic Research Service. *Feed Grains Database: Yearbook Tables*. "Table 5 – Sorghum: Supply and Disappearance." Washington, DC: USDA, Economic Research Service, October 12, 2011. [Accessed 2011.] Available from <http://www.ers.usda.gov/Data/FeedGrains/Yearbook/FGYearbookTable05.pdf>

In summary, about 53 percent of the total supply of grain sorghum was used domestically; approximately 38 percent was exported; and about 9 percent were carried over to the next crop year (Figure 1). The 2009/10 crop year is presented in context with recent years in Figure 2.



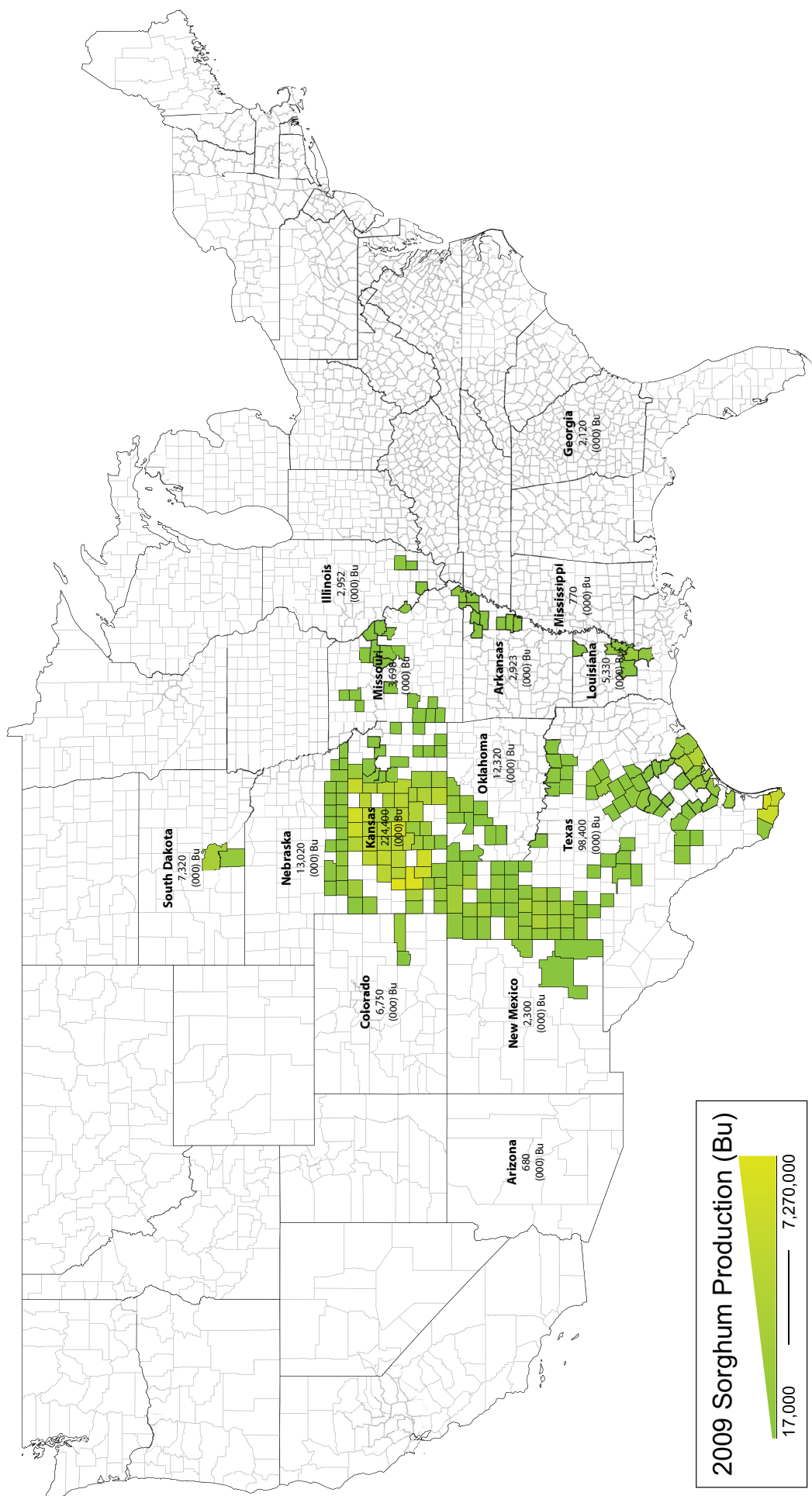
Source: Economic Research Service. *Feed Grains Database: Yearbook Tables*. "Table 5 – Sorghum: Supply and Disappearance."

Figure 1: Sorghum Supply and Disappearance 2009/10 Crop Year.



Source: Economic Research Service. *Feed Grains Database: Yearbook Tables*. "Table 5 – Sorghum: Supply and Disappearance.

Figure 2: Sorghum Supply and Disappearance 2005/06 - 2010/11 Crop Years.



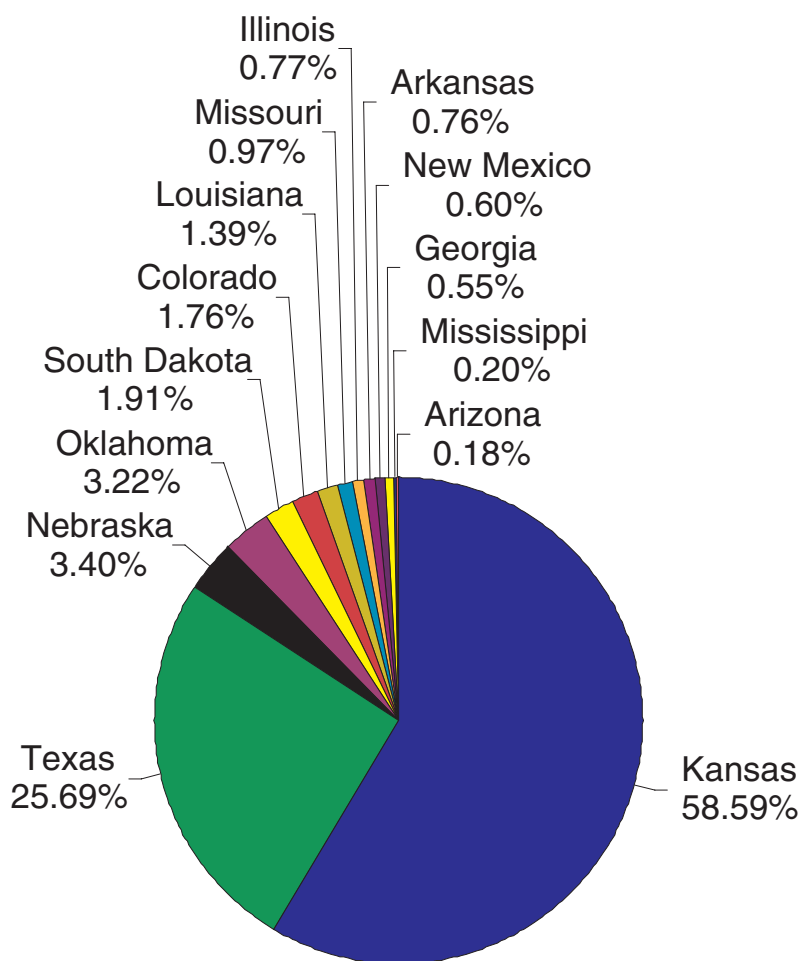
Source: National Agricultural Statistics Service. Quick Stats. "US & All States Data - Crops - Sorghum for Grain."

Figure 3: Counties Reporting Grain Sorghum Production in 2009.

Where Was Grain Sorghum Produced in 2009/10?

Figure 3 illustrates counties reporting grain sorghum production by the National Agricultural Statistics Service (NASS) in 2009/10.² It should be noted that only county-level data from counties that meet NASS confidentiality requirements are presented. Grain sorghum production was concentrated in Kansas (59 percent) and Texas (26 percent). The remaining 15 percent was produced in Nebraska, Oklahoma, South Dakota, Colorado, Louisiana, Missouri, Illinois, Arkansas, New Mexico, Georgia, Mississippi, and Arizona (Figure 4).

² National Agricultural Statistics Service. Quick Stats. "US & All States Data - Crops - Sorghum for Grain." [Accessed 2011.] Available from <http://www.nass.usda.gov/QuickStats/>



Source: National Agricultural Statistics Service. Quick Stats. "US & All States Data - Crops - Sorghum for Grain."

Figure 4: Grain Sorghum Production by State, 2009.

How Was Grain Sorghum Moved?

Grain sorghum is moved in three principal ways: by truck, water, or rail. Data are publicly available for waterborne and railroad movements. Presently, there are no available data tracking truck movements. It should also be noted that grain sorghum's movement from production to consumption could be as simple as being trucked from a farm to a elevator and then to a feed yard. At the same time, grain from a nearby farm could potentially utilize all three methods of transportation with stopovers at multiple terminals and ultimately end up on the far side of the world.

Truck Movements

Prior research, for the year 1985, indicated that truck transportation accounted for 75 percent of intrastate and 33 percent of interstate grain sorghum movement.³ More recent research, conducted in Texas in 2001, showed that grain truck movements had a median one-way trip of 150 miles.⁴ The study also reported that truck rates were higher than rail rates for distances over 100 miles, but trucking held advantages with higher turn around rates. Most of these movements are semitrailer loads with trailers not exceeding 53 feet in length. They have a maximum capacity of 26 tons or about 928 bushels of grain sorghum.

To adequately capture truck movement data would require an extensive survey of handlers in the sorghum producing region. While such a survey would capture movements and destinations associated with the 53 percent of the 2009/10 crop that was used domestically and some overland exports to Mexico, it is beyond the scope of this report.

Waterborne Movements

The Rivers and Harbors Appropriations Act of 1922 charged the US Army Corps of Engineers with responsibility for collecting information about vessels and commodities traversing US navigable waters. This data is disseminated in *Waterborne Commerce of the United States*. Data concerning the Gulf Coast and Mississippi River System are available for calendar year 2009.⁵

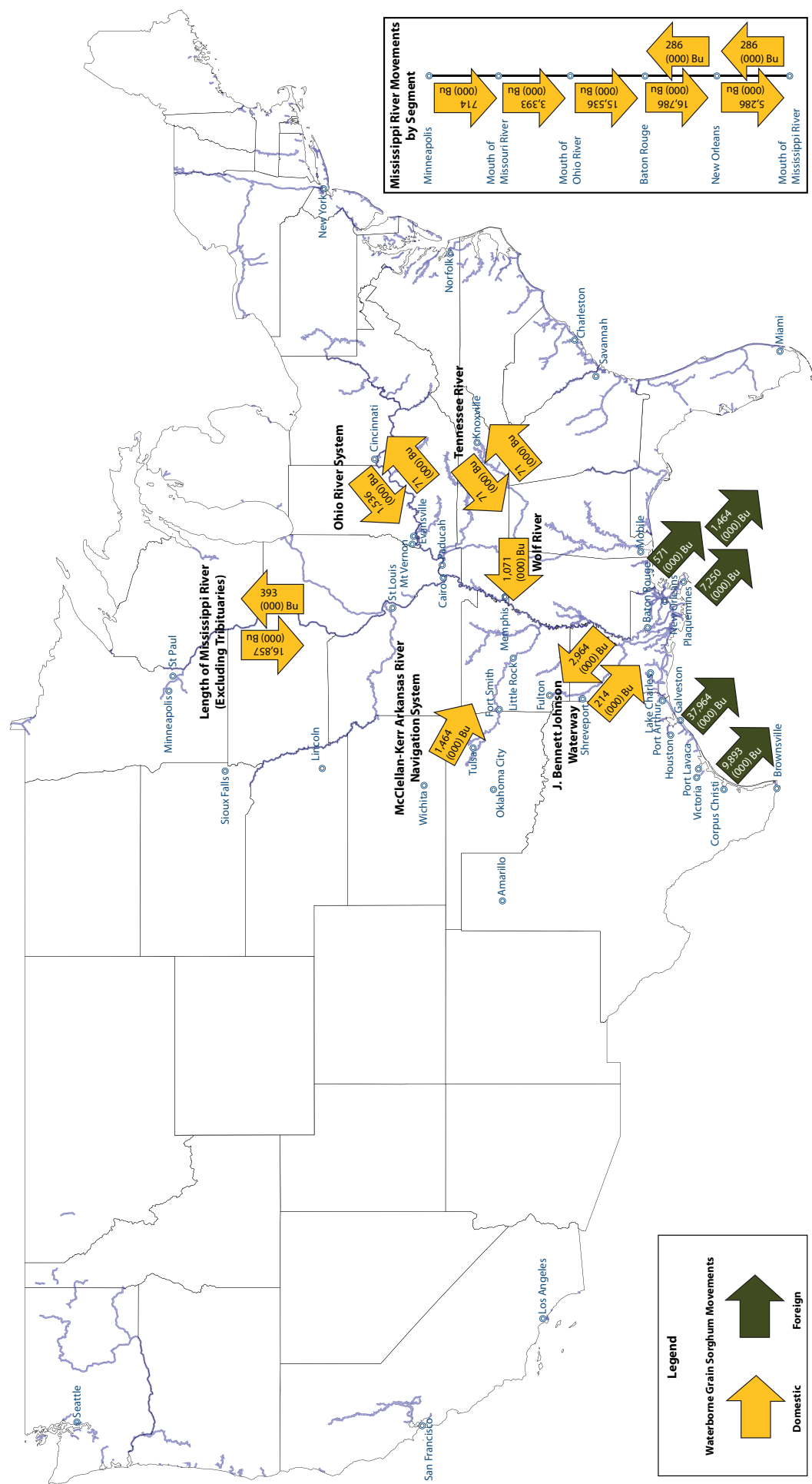
Among the many commodities tracked in this data set is commodity classification 6447 – Sorghum Grains. This data was aggregated by movements along the Mississippi River and major navigable tributaries with sorghum grains movements: Ohio River System, Tennessee River, Wolf River, J. Bennett Johnson Waterway, and the McClellan-Kerr Arkansas River Navigation System. Gulf Coast export movements were also recorded. These data are presented in Figure 5.

Waterborne transportation data indicate that most grain sorghum was shipped downstream from the Mississippi River and its tributaries to New Orleans, LA, by barge. As a point of reference, a standard barge handles 1,500 tons or about 53,500 bushels of grain sorghum. Barges are then assembled into tows of multiple barges.

³ Lowell D. Hill, Martin G. Patterson, Joseph Vercimak, Stephen W. Fuller, and Dale Anderson. *Sorghum Movements in the United States: Interregional Flow Patterns and Transportation Requirements in 1985*. Urbana-Champaign, IL: North Central Regional Research Bulletin 322, September 1990, p. 7.

⁴ Stephen Fuller, Tun-Hsiang Yu, Dennis Collier, Jerry Jamieson, and Rob Harrison. *Texas Grain Transportation Study*. Austin, TX and College Station, TX: Center for Transportation Research, The University of Texas at Austin, and the Department of Agricultural Economics, Texas A&M University, January 2001, p. 22.

⁵ Institute for Water Resources. *Waterborne Commerce of the United States: Calendar Year 2009 - Part 2 - Waterways and Harbors, Gulf Coast, Mississippi River System and Antilles*. IWR-WCUS-09-02. Washington, DC: US Army Corps of Engineers, 2011. [Accessed 2011.] Available from <http://www.ndc.iwr.usace.army.mil/wcsc/pdf/wcusmvgc09.pdf>



Source: Waterborne Commerce of the United States: Calendar Year 2009 - Part 2 - Waterways and Harbors, Gulf Coast, Mississippi River System and Antilles.

Figure 5: Waterborne Movements of Sorghum Grains along the Mississippi River System and Gulf Coast, Calendar Year 2009, Thousand Bushels.

In total, 17,286 thousand bushels of grain sorghum were moved by barge in the United States in calendar year 2009.⁶ That corresponds to 4.5 percent of the total 2009/10 crop year production. The vast majority, 16,857 thousand bushels, was moved on the Mississippi River. Looked at another way, the total grain sorghum barge movement is 10 percent greater than the total production (15,673 thousand bushels) of the five grain sorghum producing states which border the Mississippi River (Louisiana, Arkansas, Mississippi, Missouri, and Illinois).

Railroad Movements

Two Class I railroads operate in the US grain sorghum production area: Union Pacific and Burlington Northern Santa Fe. They ship grain sorghum in a variety of hopper cars which depending on the model can handle between 100 - 125 tons (3,500 - 4,460 bushels) of grain sorghum. Shipments range from an individual rail car to shuttle trains (unit trains) of 110 cars of grain sorghum.

The Surface Transportation Board has regulatory oversight over US railroads and maintains data on rail commerce. Among this data is a sample of carload waybills, which contain origin, destination, product, tonnage, revenue, and other information.⁷ Obviously, data of this type is quite sensitive in a competitive industry and strict confidentiality is maintained. For general research purposes, a public use version of Carload Waybill Sample is available with non-confidential aggregated data.

Among the many commodities and products which move by rail are grain sorghum, which are captured in Standard Transportation Commodity Code 01136: Sorghum Grains. While this data is only a sample, through expansion factors, it is possible to derive estimates for total movements. For our purposes, only three categories were of interest: origin, destination and tonnage.

To maintain confidentiality, the origin and destination data was aggregated by the Surface Transportation Board into a combination of either Bureau of Economic Analysis (BEA) regions (Figure 6) or one of five Freight Rate Territories. The Freight Rate Territories were defined in the early 20th Century by geographic boundaries and the routes of certain railroads, many of which are now defunct. These five regions are also generalized in Figure 6.

The expanded grain sorghum rail movements were initially quite complicated (see Appendix A). Further aggregation revealed a series of very logical movements to eight destinations (Figure 7). By volume, 45 percent of the 2009 rail movement of grain sorghum terminated in BEA region 131, which includes the port facilities at Houston, TX. The second greatest movement of grain sorghum by volume, 21 percent, was from Great Plains origins to the Mountain Pacific Freight Rate Territory. It is most likely that this is primarily export movements terminating in Pacific Northwest ports (Seattle, WA, and Portland, OR). Eleven percent of grain sorghum rail volume was exported to Mexico (Figure 7). Another 11 percent of grain sorghum volume was identified as ending in the Southwestern Freight Rate Territory. Additional aggregate movements, six percent, were from Great Plains origins and remained in the Western Trunk Freight Rate Territory (Figure 7). Four percent of volume moved from BEA Region 125 and the Southwestern Freight Rate Territory to BEA Region 83 which contains New Orleans, LA, and other Mississippi River ports. Two final aggregate movements of two and one percent respectively terminated in the Official and the Southern Freight Rate Territories. It could be assumed that these grains were either consumed or were shipped to Mississippi River System ports (Figure 7).

⁶ Institute for Water Resources. *Waterborne Commerce of the United States: Calendar Year 2009 - Part 5 - National Summaries*. IWR-WCUS-09-05. Washington, DC: US Army Corps of Engineers, 2011, p. 2-11. [Accessed 2011.] Available from <http://www.ndc.iwr.usace.army.mil/wcsc/pdf/wcusnatl09.pdf>

⁷ Surface Transportation Board. *Industry Data>Economic Data: Waybill*. "2009 Public Use Waybill." [Accessed 2011.] Available from http://www.stb.dot.gov/stb/industry/econ_waybill.html

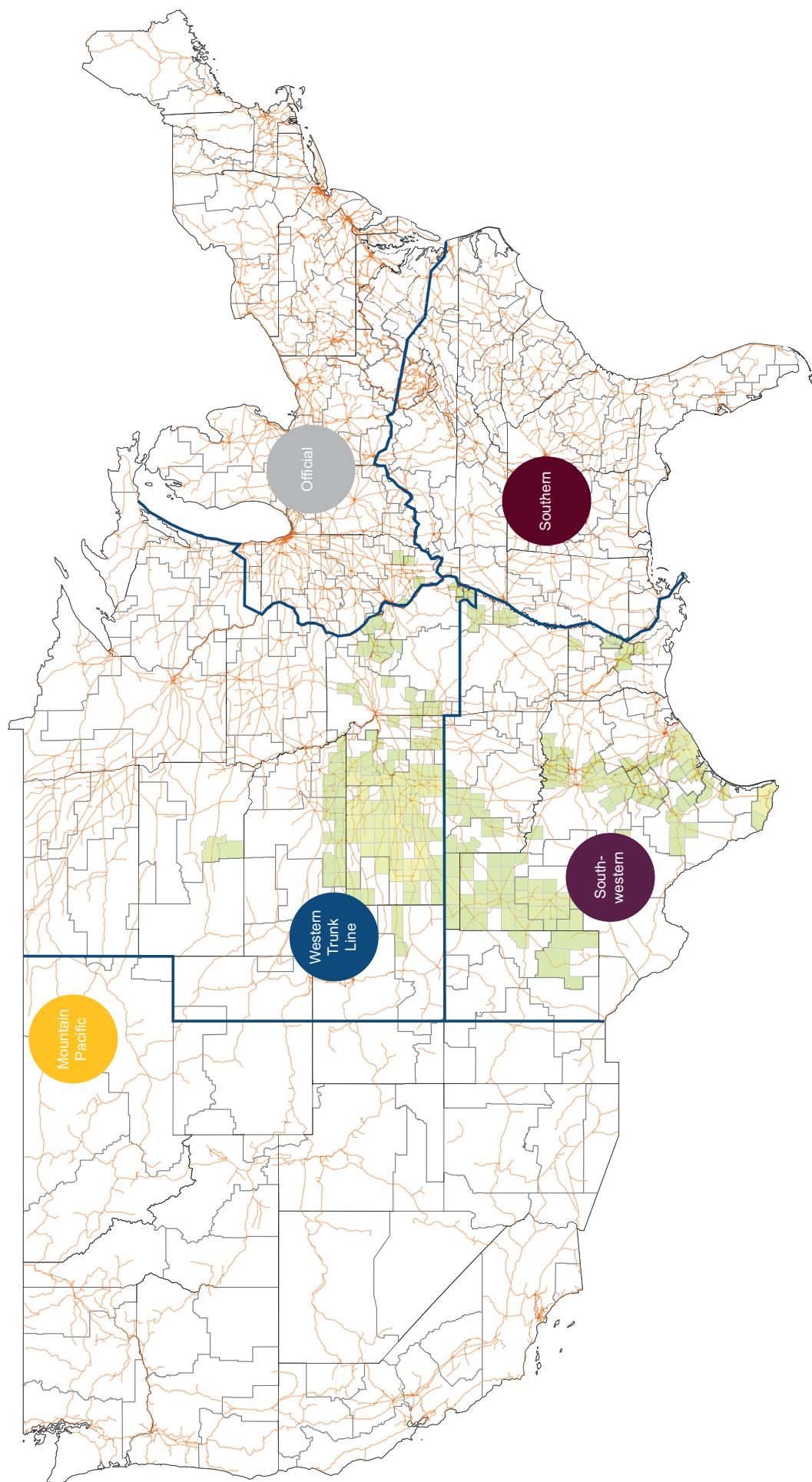


Figure 6: The US Rail Network with Sorghum Production Counties, BEA Regions, and the Five Freight Rate Territories.



From Which Ports and To Which Destinations was Grain Sorghum Exported in 2009?

The Foreign Trade Division of the US Census Bureau maintains US export data for commodities. Data for the calendar year 2009 is available from USA Trade® Online (Appendix B).⁸ These data are tabulated by North American Industry Classification System (NAICS) commodity classification codes. Grain sorghum exports are recorded under two NAICS codes:

- 1007000020 - Grain Sorghum Used for Sowing (Appendix B)
- 1007000040 - Grain Sorghum Except Seeds for Sowing (Appendix B)

This data was recorded, aggregated and plotted in Figure 8. In 2009, Mexico was the top export customer for grain sorghum used for sowing, accounting for 63 percent of such exports by volume (Figure 8). Mexico also led with 66 percent of exports of grain sorghum not used for sowing (Figure 8).

In 2009, when aggregated, grain sorghum departed the United States from 19 ports destined for 50 countries (Figure 9). One port, Houston, TX, accounted for nearly half of all grain sorghum exports by volume (Figure 10). Four ports (Houston, TX, Laredo, TX, New Orleans, LA, and El Paso, TX) collectively accounted for 96 percent of 2009 grain sorghum exports by volume (Figure 10). Mexico received the majority, 66 percent, of aggregate US grain sorghum exports in 2009 (Figure 11). Japan received 16 percent of grain sorghum exports and an assortment of African nations rounded out the top 10 export destinations (Figure 11).

Several recent studies have addressed US grain sorghum exports to Mexico. A 2007 study reported that grain sorghum is used exclusively as animal feed in Mexico.⁹ In 2004, 68.8 percent of US grain sorghum imports by volume were to four Mexican states: Puebla, Yucatán, Jalisco and Veracruz.¹⁰

A 2011 study related that grain sorghum is fed relative to corn in Mexico due to government policies restricting corn imports.¹¹ The study found that between 2007 and 2010, US grain sorghum export shipments to Mexico averaged 49 percent by ocean, 30 percent by rail, and 21 percent by truck.¹² During this period, ocean transportation gained market share.

⁸ Foreign Trade Division, US Census Bureau. *USA Trade® Online*. [Accessed 2011.] Available from <https://www.usatradeonline.gov/>

⁹ Flynn J. Adcock, C. Parr Rosson, III and Alejandro Varela. *Tracking U.S. Grain and Soybean Exports in Mexico*. College Station, TX: Center for North American Studies, January 2007. [Accessed 2011.] Available from <http://cnas.tamu.edu/AMS%20Final%20Export%20Report.pdf>

¹⁰ *Ibid.*, p. 11.

¹¹ Delmy L. Salin. *U.S. Grain and Soybean Exports to Mexico: A Modal Share Transportation Analysis, 2007-2010*. Washington, DC: Agricultural Marketing Service, April 2011. [Accessed 2011.] Available from <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5090359>

¹² *Ibid.*, p. 16.

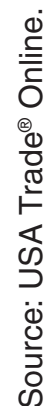
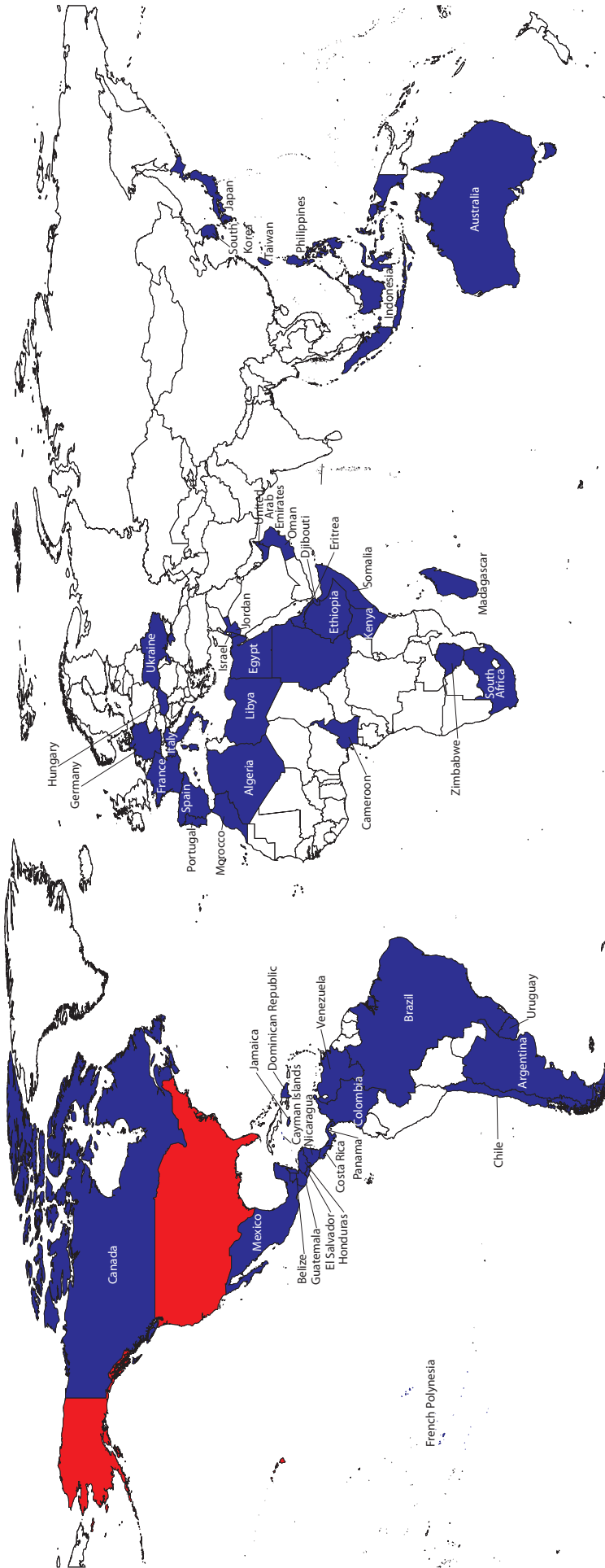
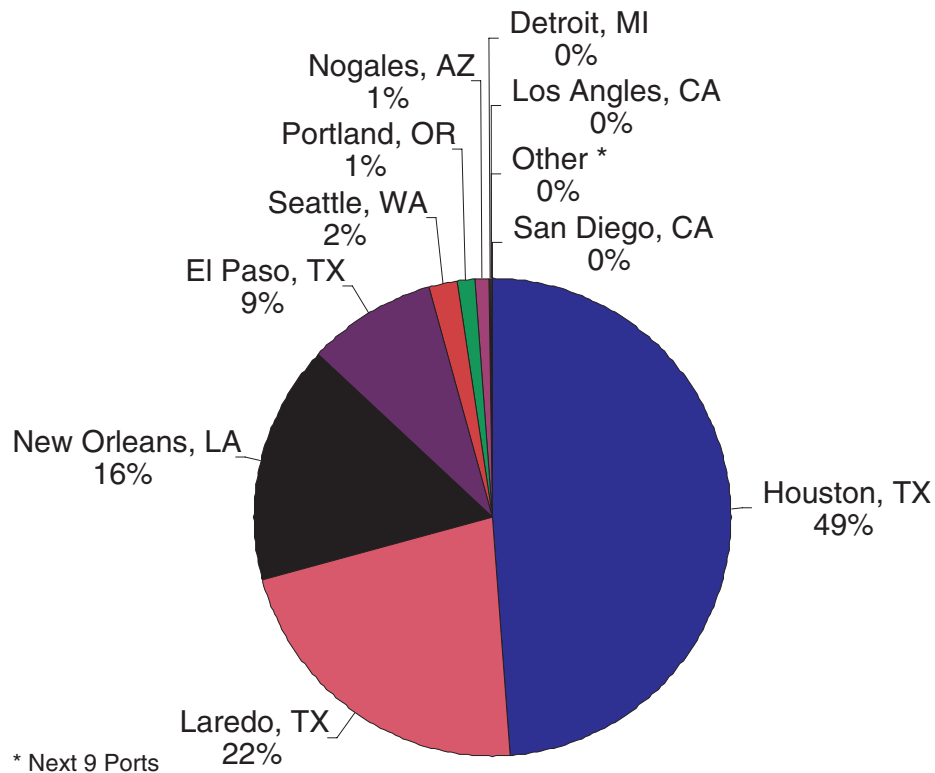


Figure 8: Sorghum Export Destinations in 2009.



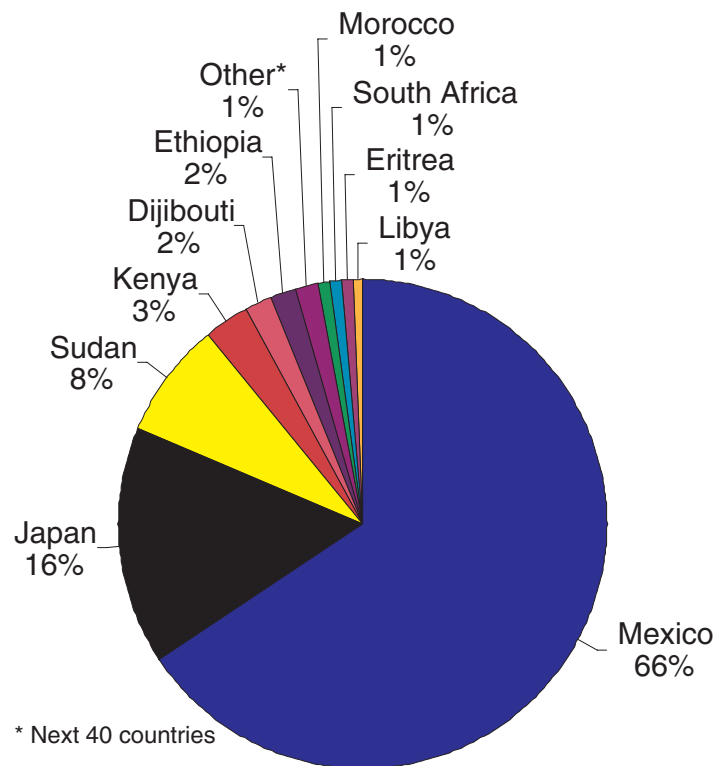
Source: USA Trade® Online.

Figure 9: Countries Receiving US Grain Sorghum Exports in 2009.



Source: USA Trade® Online.

Figure 10: Percentage Grain Sorghum Exported by Port, 2009.



Source: USA Trade® Online.

Figure 11: Sorghum Export Destinations by Volume, 2009.

What Conclusions Can be Drawn?

This study is an examination of publicly available data concerning the production and movement of grain sorghum in 2009. As Figure 12 illustrates, data totals do not align in a meaningful way. Anecdotal evidence would suggest that the addition of truck data would provide a much more complete picture of grain sorghum movements.

Long distance grain sorghum movements are being tracked with the available data. Several of the more significant movements are illustrated in Figure 13. We believe several conclusions can be drawn:

- Rail data suggests that in 2009, grain sorghum that was ultimately exported to Japan out of Pacific Northwest ports, was most likely sourced from the northern Great Plains.
- Barge and trade data suggests that in 2009, much of the grain sorghum production along the lower Mississippi River was exported to Mexico and Japan.
- The BEA district containing Houston, TX, was the primary identified destination for grain sorghum moved by rail in 2009. It can be assumed that much of this grain was exported.
- The ports of Houston, TX, New Orleans, LA, Laredo, TX, and El Paso, TX, accounted for 96 percent of US grain sorghum exports in 2009.
- Mexico was the destination for 66 percent of US grain sorghum exports in 2009.

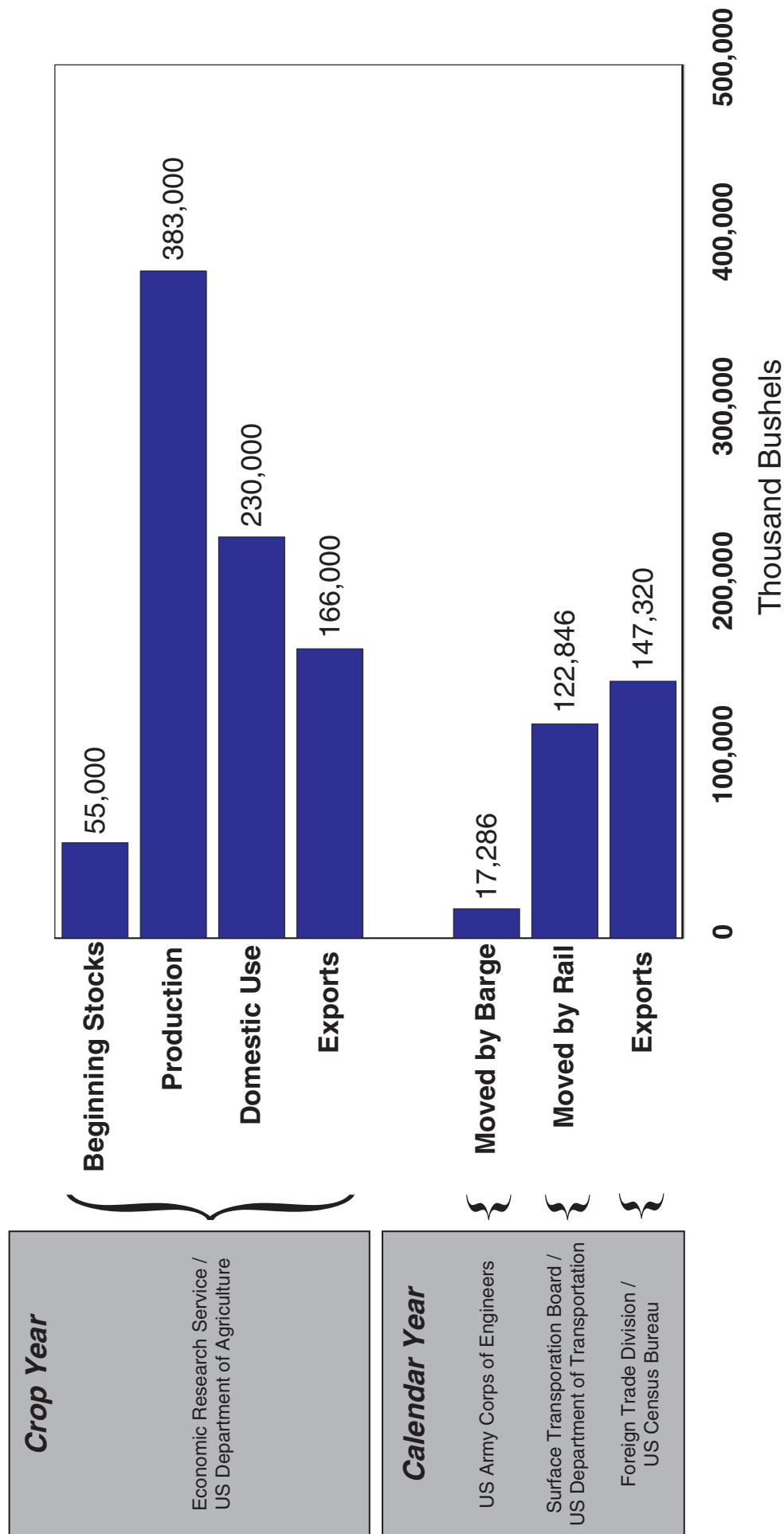


Figure 12: Grain Sorghum 2009/10 Crop Year Supply and Utilization Compared with Calendar Year 2009 Transportation Movements and Exports.

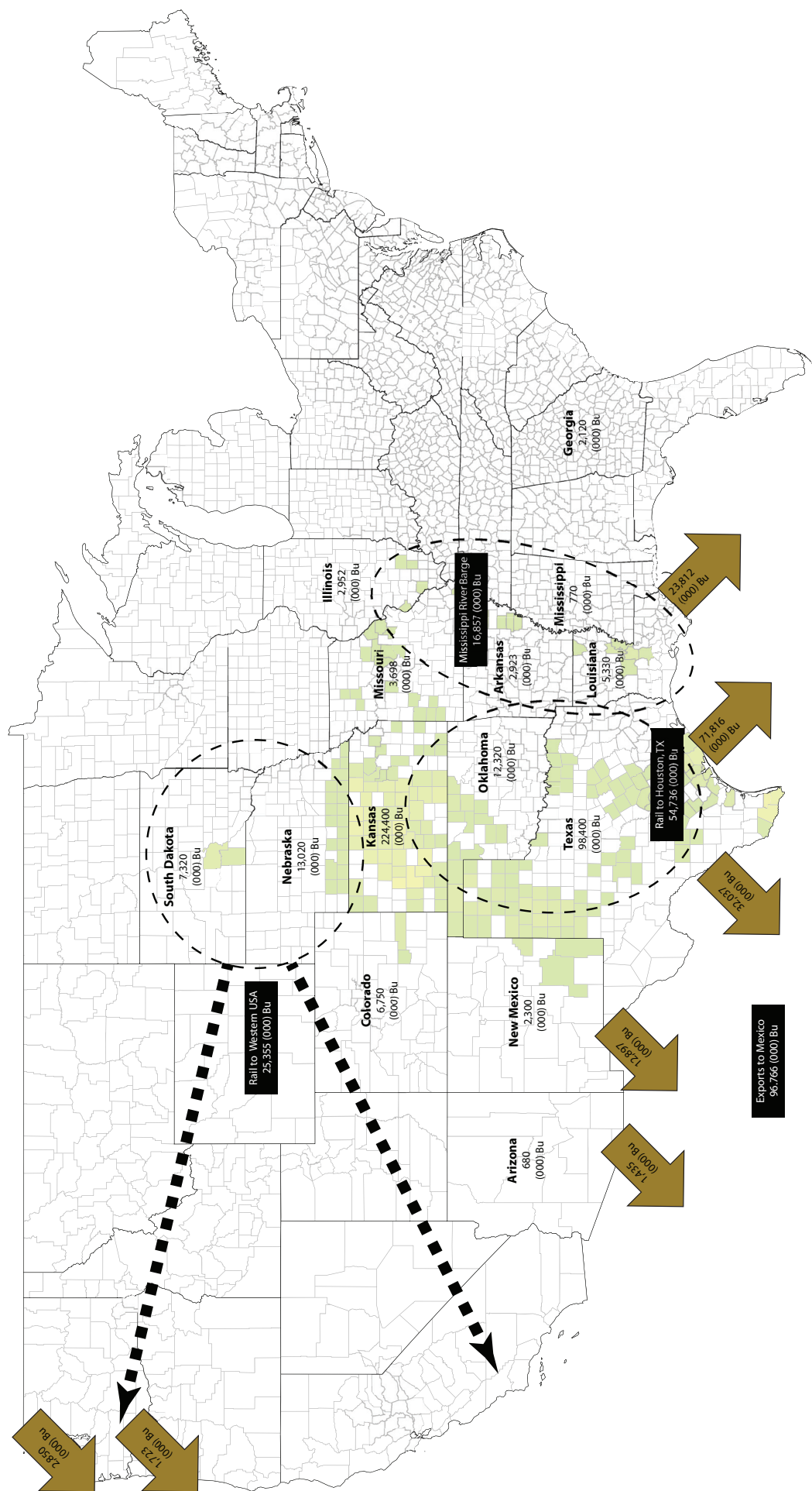


Figure 13: Major Grain Sorghum Movements in 2009.

Appendix A: 2009 Grain Sorghum Rail Movements.

	1000 Bushels	Origin Sioux Falls	Origin Oklahoma	Origin Wichita KS	Origin Amarillo NM	Origin Lincoln NE	Origin Western Trunk	Origin SW Territory	Origin Official	Origin Evans ville	Origin Mountain	Origin Frt Rate Territory	Termination Frt Rate Territory	possible end St Louis Miss River	New Orleans	Mexico	Houston Galveston	Official Territory	Southern Territory	Mountain Pacific	Southwest Territory	Western Territory
1	210	210	-	-	-	-	-	-	-	-	-	W	W	210	-	-	-	-	-	-	-	-
2	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
3	376	376	-	-	-	-	-	-	-	-	-	W	W	376	-	-	-	-	-	-	-	-
4	168	168	-	-	-	-	-	-	-	-	-	W	W	168	-	-	-	-	-	-	-	-
5	920	-	920	-	-	-	-	-	-	-	-	SW	S	-	920	-	-	-	-	-	-	-
6	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
7	140	140	-	-	-	-	-	-	-	-	-	W	W	140	-	-	-	-	-	-	-	-
8	863	-	863	-	-	-	-	-	-	-	-	SW	S	-	863	-	-	-	-	-	-	-
9	376	-	-	-	-	-	376	-	-	-	-	W	W	376	-	-	-	-	-	-	-	-
10	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
11	209	209	-	-	-	-	-	-	-	-	-	W	W	209	-	-	-	-	-	-	-	-
12	287	-	-	-	-	-	287	-	-	-	-	W	O	-	-	-	-	287	-	-	-	-
13	210	210	-	-	-	-	-	-	-	-	-	W	W	210	-	-	-	-	-	-	-	-
14	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
15	168	168	-	-	-	-	-	-	-	-	-	W	W	168	-	-	-	-	-	-	-	-
16	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
17	126	126	-	-	-	-	-	-	-	-	-	W	W	126	-	-	-	-	-	-	-	-
18	140	140	-	-	-	-	-	-	-	-	-	W	W	140	-	-	-	-	-	-	-	-
19	210	210	-	-	-	-	-	-	-	-	-	W	W	210	-	-	-	-	-	-	-	-
20	125	125	-	-	-	-	-	-	-	-	-	W	W	125	-	-	-	-	-	-	-	-
21	136	136	-	-	-	-	-	-	-	-	-	W	W	136	-	-	-	-	-	-	-	-
22	136	136	-	-	-	-	-	-	-	-	-	W	W	136	-	-	-	-	-	-	-	-
23	334	334	-	-	-	-	-	-	-	-	-	W	W	334	-	-	-	-	-	-	-	-
24	839	-	-	839	-	-	-	-	-	-	-	W	Mexico	-	-	839	-	-	-	-	-	-
25	377	-	-	-	-	-	-	377	-	-	-	SW	Mexico	-	-	377	-	-	-	-	-	-
26	373	-	-	-	-	-	-	373	-	-	-	SW	Mexico	-	-	373	-	-	-	-	-	-
27	480	-	-	-	-	-	480	-	-	-	-	W	Mexico	-	-	480	-	-	-	-	-	-
28	375	-	-	-	-	-	-	375	-	-	-	SW	Mexico	-	-	375	-	-	-	-	-	-
29	366	-	-	-	-	-	-	366	-	-	-	SW	Mexico	-	-	366	-	-	-	-	-	-
30	379	-	-	-	-	-	-	379	-	-	-	SW	Mexico	-	-	379	-	-	-	-	-	-
31	374	-	-	-	-	-	-	374	-	-	-	SW	Mexico	-	-	374	-	-	-	-	-	-
32	354	-	-	-	-	-	-	354	-	-	-	SW	Mexico	-	-	354	-	-	-	-	-	-
33	219	-	-	-	-	-	-	219	-	-	-	SW	Mexico	-	-	219	-	-	-	-	-	-
34	349	-	-	-	-	-	-	349	-	-	-	SW	Mexico	-	-	349	-	-	-	-	-	-
35	371	-	-	-	-	-	-	371	-	-	-	SW	Mexico	-	-	371	-	-	-	-	-	-
36	798	-	-	798	-	-	-	-	-	-	-	W	Mexico	-	-	798	-	-	-	-	-	-
37	787	-	-	787	-	-	-	-	-	-	-	W	Mexico	-	-	787	-	-	-	-	-	-
38	786	-	-	-	786	-	-	-	-	-	-	SW	Mexico	-	-	786	-	-	-	-	-	-
39	806	-	-	806	-	-	-	-	-	-	-	W	Mexico	-	-	806	-	-	-	-	-	-
40	808	-	-	-	-	-	-	808	-	-	-	SW	Mexico	-	-	808	-	-	-	-	-	-
41	808	-	-	808	-	-	-	-	-	-	-	W	Mexico	-	-	808	-	-	-	-	-	-
42	365	-	-	-	-	-	-	365	-	-	-	SW	Mexico	-	-	365	-	-	-	-	-	-
43	338	-	-	-	-	-	-	338	-	-	-	SW	Mexico	-	-	338	-	-	-	-	-	-
44	354	-	-	-	-	-	-	354	-	-	-	SW	Mexico	-	-	354	-	-	-	-	-	-
45	761	-	-	-	-	-	-	761	-	-	-	SW	Mexico	-	-	761	-	-	-	-	-	-
46	362	-	-	-	-	-	-	362	-	-	-	SW	Mexico	-	-	362	-	-	-	-	-	-
47	360	-	-	-	-	-	-	360	-	-	-	SW	Mexico	-	-	360	-	-	-	-	-	-
48	370	-	-	-	-	-	-	370	-	-	-	SW	Mexico	-	-	370	-	-	-	-	-	-
49	355	-	-	-	-	-	-	355	-	-	-	SW	Mexico	-	-	355	-	-	-	-	-	-
50	140	-	-	-	-	-	-	-	140	-	-	W	O	-	-	-	-	140	-	-	-	-
51	141	-	-	-	-	-	141	-	-	-	-	O	O	-	-	-	-	141	-	-	-	-
52	209	-	-	-	-	-	-	-	209	-	-	O	O	-	-	-	-	209	-	-	-	-
53	219	-	-	-	-	-	-	219	-	-	-	SW	S	-	-	-	-	-	219	-	-	-
54	144	-	-	-	-	-	-	-	144	-	-	O	S	-	-	-	-	-	144	-	-	-
55	168	-	-	-	-	-	-	-	168	-	-	O	O	-	-	-	-	168	-	-	-	-
56	173	-	-	-	-	-	-	-	-	173	-	O	S	-	-	-	-	-	173	-	-	-
57	180	-	-	-	-	-	-	-	180	-	-	O	S	-	-	-	-	-	180	-	-	-
58	123	-	-	-	-	-	-	-	123	-	-	O	O	-	-	-	-	123	-	-	-	-
59	141	-	-	-	-	-	-	-	-	141	-	O	O	-	-	-	-	141	-	-	-	-
60	144	-	-	-	-	-	-	144	-	-	-	SW	S	-	-	-	-	-	144	-	-	-
61	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
62	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
63	139	-	-	-	-	-	-	-	-	139	-	O	O	-	-	-	-	139	-	-	-	-
64	124	-	-	-	-	-	-	-	-	124	-	O	O	-	-	-	-	124	-	-	-	-
65	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
66	144	-	-	-	-	-	-	-	-	144	-	O	S	-	-	-	-	-	144	-	-	-
67	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
68	144	-	-	-	-	-	-	-	144	-	-	O	S	-	-	-	-	-	144	-	-	-
69	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
70	139	-	-	-	-	-	-	-	139	-	-	O	O	-	-	-	-	139	-	-	-	-
71	141	-	-	-	-	-	-	-	-	141	-	O	O	-	-	-	-	141	-	-	-	-
72	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
73	143	-	-	-	-	-	-	-	-	143	-	O	O	-	-	-	-	143	-	-	-	-
74	141	-	-	-	-	-	-	-	-	141	-	O	O	-	-	-	-	141	-	-	-	-
75	140	-	-	-	-	-	-	-	-	140	-	O	S	-	-	-	-	-	140	-	-	-
76	880	-	880	-	-	-	-	-	-	-	-	SW	SW	-	-	-	880	-	-	-	-	-
77	793	-	-	-	-	793	-	-	-	-	-	W	SW	-	-	-	793	-	-	-	-	-
78	1,148	-	1,148	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,148	-	-	-	-	-
79	876	-	876	-	-	-	-	-	-	-	-	SW	SW	-	-	-	876	-	-	-	-	-
80	800	-	800	-	-	-	-	-	-	-	-	SW	SW	-	-	-	800	-	-	-	-	-
81	875	-	875	-	-	-	-	-	-	-	-	SW	SW	-	-	-	875	-	-	-	-	-
82	889	-	889	-	-	-	-	-	-	-	-	SW	SW	-	-	-	889	-	-	-	-	-
83	1,080	-	1,080	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,080	-	-	-	-	-
84	908	-	-	-	-	-	-	908	-	-	-	SW	SW	-	-	-	908	-	-	-	-	-
85	857	-	857	-	-	-	-	-	-	-	-	SW	SW	-	-	-	857	-	-	-	-	-
86	796	-	796	-	-	-	-	-	-	-	-	SW	SW	-	-	-	796	-	-	-	-	-
87	911	-	-	-	911	-	-	-	-	-	-	SW	SW	-	-	-	911	-	-	-	-	-
88	474	-	474	-	-	-	-	-	-	-	-	SW	SW	-	-	-	474	-	-	-	-	-
89	880	-	880	-	-	-	-	-	-	-	-	SW	SW	-	-	-	880	-	-	-	-	-
90	793	-	-	-	-	-	-	793	-	-	-	SW	SW	-	-	-	793	-	-	-	-	-
91	793	-	-	-	-	-	-	793	-	-	-	SW	SW									

Appendix A (continued): 2009 Grain Sorghum Rail Movements.

	1000 Bushels	Origin Sioux Falls	Origin Oklahoma	Origin Wichita KS	Origin Amarillo NM	Origin Lincoln NE	Origin Western Trunk	Origin SW Territory	Origin Official	Origin Evans ville	Origin Mountain	Origin Frt Rate Territory	Termination Frt Rate Territory	possible end St Louis Miss River	New Orleans	Mexico	Houston Galveston	Official Territory	Southern Territory	Mountain Pacific	Southwest Territory	Western Territory
102	884	-	-	-	-	-	-	884	-	-	-	SW	SW	-	-	-	884	-	-	-	-	-
103	872	-	872	-	-	-	-	-	-	-	-	SW	SW	-	-	-	872	-	-	-	-	-
104	800	-	800	-	-	-	-	-	-	-	-	SW	SW	-	-	-	800	-	-	-	-	-
105	868	-	868	-	-	-	-	-	-	-	-	SW	SW	-	-	-	868	-	-	-	-	-
106	919	-	-	-	-	-	-	919	-	-	-	SW	SW	-	-	-	919	-	-	-	-	-
107	147	-	-	147	-	-	-	-	-	-	-	W	MP	-	-	-	-	-	-	147	-	-
108	829	-	829	-	-	-	-	-	-	-	-	SW	SW	-	-	-	829	-	-	-	-	-
109	144	-	-	144	-	-	-	-	-	-	-	W	MP	-	-	-	-	-	-	144	-	-
110	141	-	-	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	141	-
111	808	-	-	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	808	-
112	526	-	-	-	-	-	-	526	-	-	-	SW	SW	-	-	-	-	-	-	-	526	-
113	453	-	-	-	-	-	-	453	-	-	-	SW	SW	-	-	-	-	-	-	-	453	-
114	819	-	819	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	819	-
115	808	-	-	-	-	-	-	808	-	-	-	SW	SW	-	-	-	-	-	-	-	808	-
116	878	-	878	-	-	-	-	-	-	-	-	SW	SW	-	-	-	878	-	-	-	-	-
117	212	-	-	-	-	-	-	-	-	-	212	M	M	-	-	-	-	-	-	212	-	-
118	870	-	870	-	-	-	-	-	-	-	-	SW	SW	-	-	-	870	-	-	-	-	-
119	870	-	870	-	-	-	-	-	-	-	-	SW	SW	-	-	-	870	-	-	-	-	-
120	808	-	-	-	-	-	-	808	-	-	-	SW	SW	-	-	-	-	-	-	-	808	-
121	895	-	-	-	-	895	-	-	-	-	-	W	M	-	-	-	-	-	-	895	-	-
122	155	-	-	-	-	-	-	155	-	-	-	SW	SW	-	-	-	-	-	-	-	155	-
123	399	-	399	-	-	-	-	-	-	-	-	SW	SW	-	-	-	399	-	-	-	-	-
124	893	893	-	-	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	893	-	-
125	874	-	-	-	-	-	-	874	-	-	-	SW	SW	-	-	-	874	-	-	-	-	-
126	797	-	-	-	-	-	-	797	-	-	-	SW	SW	-	-	-	-	-	-	-	797	-
127	895	-	-	-	-	895	-	-	-	-	-	W	M	-	-	-	-	-	-	895	-	-
128	911	-	911	-	-	-	-	-	-	-	-	SW	SW	-	-	-	911	-	-	-	-	-
129	920	-	920	-	-	-	-	-	-	-	-	SW	SW	-	-	-	920	-	-	-	-	-
130	795	-	-	-	-	795	-	-	-	-	-	W	M	-	-	-	-	-	-	795	-	-
131	893	893	-	-	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	893	-	-
132	884	-	884	-	-	-	-	-	-	-	-	SW	SW	-	-	-	884	-	-	-	-	-
133	320	320	-	-	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	320	-	-
134	816	-	816	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	816	-
135	816	-	-	-	-	-	-	816	-	-	-	SW	SW	-	-	-	-	-	-	-	816	-
136	824	-	824	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	824	-
137	823	-	823	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	823	-
138	779	-	-	-	-	-	-	779	-	-	-	SW	SW	-	-	-	-	-	-	-	779	-
139	418	-	418	-	-	-	-	-	-	-	-	SW	SW	-	-	-	418	-	-	-	-	-
140	808	-	-	-	-	-	-	808	-	-	-	SW	SW	-	-	-	-	-	-	-	808	-
141	842	-	-	-	-	-	-	842	-	-	-	SW	SW	-	-	-	842	-	-	-	-	-
142	904	-	904	-	-	-	-	-	-	-	-	SW	SW	-	-	-	904	-	-	-	-	-
143	782	-	-	-	782	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	782	-
144	920	-	920	-	-	-	-	-	-	-	-	SW	SW	-	-	-	920	-	-	-	-	-
145	454	-	-	-	-	-	454	-	-	-	-	W	W	454	-	-	-	-	-	-	-	-
146	920	-	920	-	-	-	-	-	-	-	-	SW	SW	-	-	-	920	-	-	-	-	-
147	919	-	919	-	-	-	-	-	-	-	-	SW	SW	-	-	-	919	-	-	-	-	-
148	838	-	838	-	-	-	-	-	-	-	-	SW	SW	-	-	-	-	-	-	-	838	-
149	893	-	-	-	-	-	893	-	-	-	-	W	SW	-	-	-	893	-	-	-	-	-
150	904	-	-	-	-	-	904	-	-	-	-	M	M	-	-	-	-	-	-	904	-	-
151	317	-	-	-	-	317	-	-	-	-	-	W	M	-	-	-	-	-	-	317	-	-
152	1,178	-	1,178	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,178	-	-	-	-	-
153	819	-	819	-	-	-	-	-	-	-	-	SW	SW	-	-	-	819	-	-	-	-	-
154	785	-	785	-	-	-	-	-	-	-	-	SW	SW	-	-	-	785	-	-	-	-	-
155	867	-	-	-	-	-	-	867	-	-	-	SW	SW	-	867	-	-	-	-	-	-	-
156	751	-	751	-	-	-	-	-	-	-	-	SW	SW	-	-	-	751	-	-	-	-	-
157	819	-	-	-	-	-	-	819	-	-	-	SW	SW	-	-	-	819	-	-	-	-	-
158	1,127	-	-	-	-	1,127	-	-	-	-	-	W	M	-	-	-	-	-	-	1,127	-	-
159	1,138	-	-	1,138	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,138	-	-
160	1,135	-	-	1,135	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,135	-	-
161	798	-	798	-	-	-	-	-	-	-	-	SW	SW	-	798	-	-	-	-	-	-	-
162	1,035	-	-	1,035	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,035	-	-
163	1,013	-	1,013	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,013	-	-	-	-	-
164	1,169	-	1,169	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,169	-	-	-	-	-
165	1,000	-	-	1,000	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,000	-	-
166	366	-	-	366	-	-	-	-	-	-	-	W	W	-	-	-	-	-	-	-	366	-
167	419	-	-	419	-	-	-	-	-	-	-	W	W	-	-	-	-	-	-	-	419	-
168	1,137	-	-	1,137	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,137	-	-
169	1,008	-	-	1,008	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,008	-	-
170	752	-	752	-	-	-	-	-	-	-	-	SW	SW	-	-	-	752	-	-	-	-	-
171	1,134	-	-	1,134	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,134	-	-
172	219	-	-	-	-	219	-	-	-	-	-	W	W	-	-	-	-	-	-	-	219	-
173	365	-	-	365	-	-	-	-	-	-	-	W	W	-	-	-	-	-	-	-	365	-
174	424	-	-	424	-	-	-	-	-	-	-	W	W	-	-	-	-	-	-	-	424	-
175	1,182	-	1,182	-	-	-	-	-	-	-	-	SW	SW	-	-	-	1,182	-	-	-	-	-
176	1,018	-	-	1,018	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,018	-	-
177	1,017	-	-	1,017	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,017	-	-
178	1,079	-	-	-	-	1,079	-	-	-	-	-	W	SW	-	-	-	1,079	-	-	-	-	-
179	794	-	794	-	-	-	-	-	-	-	-	SW	SW	-	-	-	794	-	-	-	-	-
180	259	-	-	259	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	259	-	-
181	159	-	-	-	-	159	-	-	-	-	-	W	M	-	-	-	-	-	-	159	-	-
182	819	-	-	-	-	-	-	819	-	-	-	SW	SW	-	-	-	-	-	-	-	819	-
183	976	-	976	-	-	-	-	-	-	-	-	SW	SW	-	-	-	976	-	-	-	-	-
184	1,137	-	-	1,137	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,137	-	-
185	159	-	-	-	-	159	-	-	-	-	-	W	M	-	-	-	-	-	-	159	-	-
186	1,137	-	-	1,137	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,137	-	-
187	1,129	-	-	-	-	1,129	-	-	-	-	-	W	M	-	-	-	-	-	-	1,129	-	-
188	270	-	-	-	-	-	-	270	-	-	-	SW	SW	-	-	-	-	-	-	-	270	-
189	418	-	-	-	-	-	-	418	-	-	-	SW	SW	-	-	-	-	-	-	-	418	-
190	1,139	-	-	1,139	-	-	-	-	-	-	-	W	M	-	-	-	-	-	-	1,139	-	-
191	1,140	-																				

Appendix B: US Grain Sorghum Exports by Port and Destination, 2009.

NAICS 1007000020 - Grain Sorghum Used for Sowing

NAICS 1007000040 - Grain Sorghum Except Seeds for Sowing

	1000 Bu	Total		1000 Bu	Total
Charleston, SC			Houston/Galveston, TX		
Jordan	0.71		Cameroon	41.65	
Total		0.71	Chile	45,165.79	
Houston/Galveston, TX			Djibouti	1,051.84	
Algeria	0.19		Egypt	99.21	
Argentina	23.83		Eritrea	1,109.00	
Belize	13.93		Ethiopia	183.02	
Chile	2.90		Kenya	708.63	
Columbia	2.93		Libya	2,596.34	
El Salvador	19.22		Madagascar	2,555.79	
France	2.03		Mexico	4,395.58	
Germany	0.54		Morocco	953.89	
Guatemala	0.76		Oman	74.80	
Honduras	7.04		Somalia	149.17	
Hungary	0.31		South Africa	47.24	
Italy	2.80		Sudan	1,102.31	
Jordan	0.35		Venezuela	11,334.12	
Nicaragua	6.38		Zimbabwe	248.81	
Panama	14.17		Total		71,817.20
Portugal	3.21				
South Africa	14.24		Laredo, TX		
Spain	0.71		Mexico	32,036.91	
Ukraine	0.79		Total		32,036.91
Uruguay	4.81				
Total		121.13	Los Angeles, CA		
Laredo, TX			Japan	6.30	
Mexico	272.69		South Korea	14.17	
Total		272.69	Taiwan	43.07	
			Ukraine	14.02	
Los Angeles, CA			Total		77.56
Japan	2.18				
Phillipines	10.58		Mobile, AL		
South Korea	1.36		Belize	6.26	
Spain	0.38		Total		6.26
United Arab Emirates	0.27				
Total		14.77	New Orleans, LA		
San Francisco, CA			Japan	18,574.22	
Australia	1.25		Mexico	4,913.16	
Japan	0.70		Morocco	186.64	
Total		1.95	Zimbabwe	137.79	
			Total		23,811.81
Savannah, GA			San Francisco, CA		
France	8.45		French Polynesia	1.57	
Germany	0.35		Japan	6.22	
Israel	2.11		Total		7.79
Italy	3.15				
South Africa	0.24		Seattle, WA		
Total		14.30	Japan	2,841.64	
Seattle, WA			South Korea	8.31	
Indonesia	1.67		Total		2,849.95
Taiwan	1.79				
Total		3.46	Detroit, MI		
El Paso, TX			Canada	137.83	
Mexico	1.89		Total		137.83
Total		1.89			
Miami, FL			Portland, OR		
Argentina	1.74		Japan	1,722.99	
Belize	0.61		Total		1,722.99
Brazil	0.08				
Costa Rica	0.05		El Paso, TX		
Dominican Republic	0.13		Mexico	12,896.92	
Jamaica	6.64		Total		12,896.92
Panama	0.16				
Total		9.42	Miami, FL		
New York City, NY			Caymen Islands	2.56	
Australia	0.12		Total		2.56
South Korea	0.04				
Total		0.16	Nogales, AZ		
Nogales, AZ			Mexico	1,435.37	
Mexico	0.79		Total		1,435.37
Total		0.79			
Norfolk, VA			Ogdensburg, NY		
Portugal	0.17		Canada	2.20	
Total		0.17	Total		2.20
San Diego, CA					
Mexico	9.53		Pembina, ND		
Total		9.53	Canada	30.31	
			Total		30.31
Total		450.98	San Diego, CA		
			Mexico	32.52	
			Total		32.52
			Low Value		
			Canada	0.39	
			Unknown	0.39	0.79
			Total		146,868.97

Source: USA Trade® Online.

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Department of Agricultural Economics
Texas A&M University
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