

Grain Sorghum Methodology

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The pricing methodology for grain sorghum uses a factor applied to corn prices. The factor is derived from historical regional-weighted grain sorghum prices and corn prices from the futures market. The same factor is used for both projected and harvest prices.

The methodology uses: 1) price series from six different major sorghum growing regions to produce a weighted average price series for grain sorghum, and 2) Chicago Board of Trade (CBOT) prices for corn. Price series for the sorghum growing regions are weighted based on the proportion of grain sorghum production in each region in each year. Four price series correspond to regions in New Mexico, Oklahoma, and Texas. These regions are defined as Houston/Galveston Port, North of the Canadian River, South of Line, and Triangle Area. The two other price series are for Kansas City and New Orleans. Kansas City prices correspond to all of Kansas and Nebraska. New Orleans prices correspond to all of Arkansas, Louisiana, and Mississippi. Annual grain sorghum production data for the states of Arkansas, Kansas, Louisiana, Mississippi, and Nebraska, and county-level production data for New Mexico, Oklahoma, and Texas are collected from NASS/USDA.

For grain sorghum, weekly price data for locations in New Mexico, Oklahoma, and Texas are provided by Texas AgriLife Extension Service (<http://agecoext.tamu.edu/resources/basis-project/basis-data>). The simple average of all September observations (corresponding to typical harvest time) in each year is calculated for each location. Monthly Kansas City and New Orleans price series are from ERS/USDA, and the September and October observations, respectively, are used for each year.

The corn price for each year is the average settlement price of December CBOT corn futures during the month of October.

A ratio for each year is computed by dividing annual weighted average grain sorghum prices across all six regions by the corresponding price of corn for each year, noted as:

$$P_{GS_t}^W = \frac{\sum_{i=1}^6 (P_{GS_t}^{R_i} * Q_{GS_t}^{R_i})}{P_{C_t}^{CBOT}}$$

Where $P_{GS_t}^W$ is the weighted price of grain sorghum in year t , $P_{GS_t}^{R_i}$ is the price in region i in year t , $Q_{GS_t}^{R_i}$ is the proportion of production in region i in year t , and $P_{C_t}^{CBOT}$ is the price of corn as derived from futures markets in year t . The most recent 10 year average of the ratios is then computed to produce the price factor as follows:

$$\frac{\sum_{t=y-9}^y (P_{GS_t}^W)}{10}$$

The year y is defined as the most recent year in the price data series. The factor will be applied to relevant futures prices with the price discovery periods using the current methodology. The discovery periods will be differentiated by a projected price discovery period and a harvest price discovery period, as well as sales closing date; however each combination will utilize the same price factor.

On occasion, certain values in the price series may not be reported. In the event that the data is incomplete in a given year, available information will be used to estimate missing values. If missing values are not able to be estimated, then both corresponding prices in that year would be removed from

the series. The resulting price factor would then still encompass exactly 10 data points, however the applicable time series would be longer than 10 years.

Appendix

List of Counties in Each Region

Houston/Galveston Port

Oklahoma

Adair, Atoka, Bryan, Carter, Cherokee, Cleveland, Choctaw, Coal, Craig, Creek, Delaware, Garvin, Haskell, Hughes, Johnston, Latimer, Le Flore, Lincoln, Love, Logan, Marshall, Mayes, McClain, McCurtain, McIntosh, Murray, Muskogee, Nowata, Okfuskee, Oklahoma, Okmulgee, Osage, Ottawa, Pawnee, Payne, Pittsburg, Pontotoc, Pottawatomie, Rogers, Seminole, Sequoyah, Tulsa, Wagoner, Washington

Texas

Anderson, Angelina, Aransas, Atascosa, Austin, Bandera, Bastrop, Bee, Bell, Bexar, Blanco, Bosque, Bowie, Brazoria, Brazos, Brooks, Brown, Burleson, Burnet, Caldwell, Calhoun, Callahan, Cameron, Camp, Cass, Chambers, Cherokee, Coleman, Collin, Colorado, Comal, Comanche, Concho, Cooke, Coryell, Dallas, Delta, Denton, DeWitt, Dimmit, Duval, Eastland, Edwards, Ellis, Erath, Falls, Fannin, Fayette, Fort Bend, Franklin, Freestone, Frio, Galveston, Gillespie, Goliad, Gonzales, Grayson, Gregg, Grimes, Guadalupe, Hamilton, Hardin, Harris, Harrison, Hays, Henderson, Hidalgo, Hill, Hood, Hopkins, Houston, Hunt, Jackson, Jasper, Jefferson, Jim Hogg, Jim Wells, Johnson, Karnes, Kaufman, Kendall, Kenedy, Kerr, Kimble, Kinney, Kleberg, Lamar, Lampasas, La Salle, Lavaca, Lee, Leon, Liberty, Limestone, Live Oak, Llano, McCulloch, McLennan, McMullen, Madison, Marion, Mason, Matagorda, Maverick, Medina, Menard, Milam, Mills, Montgomery, Morris, Nacogdoches, Navarro, Newton, Nueces, Orange, Panola, Polk, Rains, Real, Red River, Refugio, Robertson, Rockwall, Rusk, Sabine, San Augustine, San Jacinto, San Patricio, San Saba, Shelby, Smith, Somervell, Starr, Tarrant, Titus, Travis, Trinity, Tyler, Upshur, Uvalde, Van Zandt, Victoria, Walker, Waller, Washington, Webb, Wharton, Willacy, Williamson, Wilson, Wood, Zapata, Zavala

Kansas City Terminal

All Kansas; All Nebraska

New Orleans Port

All Arkansas; All Louisiana; All Mississippi

North of the Canadian River

New Mexico

Colfax, Harding, Los Alamos, McKinley, Mora, Rio Arriba, San Juan, Sandoval, Santa Fe, Taos, Union

Oklahoma

Alfalfa, Beaver, Blaine, Canadian, Cimarron, Custer, Dewey, Ellis, Garfield, Grant, Harper, Kay, Kingfisher, Major, Noble, Roger Mills, Texas, Woods, Woodward

Texas

Carson, Dallam, Gray, Hansford, Hartley, Hemphill, Hutchinson, Lipscomb, Moore, Ochiltree, Potter, Roberts, Sherman

South of Line

New Mexico

Catron, Chaves, De Baca, Dona Ana, Eddy, Grant, Hidalgo, Lea, Lincoln, Luna, Otero, Roosevelt, Sierra, Socorro

Oklahoma

Comanche, Cotton, Jefferson, Stephens

Texas

Andrews, Archer, Bailey, Baylor, Borden, Brewster, Clay, Cochran, Coke, Cottle, Crane, Crockett, Crosby, Culberson, Dawson, Dickens, Ector, El Paso, Fisher, Floyd, Foard, Gaines, Garza, Glasscock, Hale, Haskell, Hockley, Howard, Hudspeth, Irion, Jack, Jeff Davis, Jones, Kent, King, Knox, Lamb, Loving, Lubbock, Lynn, Martin, Midland, Mitchell, Montague, Motley, Nolan, Palo Pinto, Parker, Pecos, Presidio, Reagan, Reeves, Runnels, Schleicher, Scurry, Shackelford, Stephens, Sterling, Stonewall, Sutton, Taylor, Terrell, Terry, Throckmorton, Tom Green, Upton, Val Verde, Ward, Wichita, Winkler, Wise, Yoakum, Young

Triangle Area

New Mexico

Bernalillo, Cibola, Curry, Guadalupe, Quay, San Miguel, Tarrant, Valencia

Oklahoma

Beckham, Caddo, Grady, Greer, Harmon, Jackson, Kiowa, Tillman, Washita

Texas

Armstrong, Briscoe, Castro, Childress, Collingsworth, Deaf Smith, Donley, Hall, Hardeman, Oldham, Parmer, Randall, Swisher, Wheeler, Wilbarger