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Guar Update, West Texas

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This summary is in response to numerous guar inquiries from industry, prospective investors, and producers to the Texas AgriLife/Texas A&M University agriculture program since early 2011. Currently, on an annual basis guar is contracted and mostly grown in the lower Texas High Plains (Lubbock region), the Rolling Plains (to the east, toward Vernon and Wichita Falls, TX), and occasionally in southwest Oklahoma. Some scattered acreage is also contracted and grown in the Concho Valley/San Angelo region as well as the Texas Gulf Coast/Corpus Christi area.

The guar business in the region here currently consists of two primary entities:

- West Texas Guar, Brownfield, TX, (806) 637-4662, <http://www.westtexasguar.com> (Klint Forbes, owner/manager, klint@westtexasguar.com). West Texas Guar currently serves as the only contractor and receiver for farm production of guar in the U.S. West Texas Guar is also the only significant source of guar seed in the U.S., but they only provide seed to those individuals (farmers) who have a signed production contract with WTG. In addition, WTG has a small processing facility including a powder plant for producing guar gum (Guar-Tex, <http://www.guar-tex.com>).
- Rhodia, Inc., Vernon, TX, (940) 552-9911, <http://www.rhodia.com> (part of the Solvay Group, Jim Reaves, manager, jreaves@us.rhodia.com) operates a processing plant which processes imported splits only. Rhodia stopped accepting U.S. production about 2007 though they still have the splitting equipment. Rhodia is currently expanding their split processing capacity by 40%, but at this time they do not plan to resume processing (splitting) U.S. grown raw guar.

In addition, three other Texas entities have guar seed interests as noted below. Among guar seed varieties in the U.S., four are older public varieties (from Texas AgriLife—Kinman, Lewis, Esser; from Arizona—Santa Cruz) and may be grown, bought, and sold without restriction or royalties. Two additional varieties, Matador and Monument are owned by Texas Tech University and are protected under federal seed law and may require a material transfer agreement or memorandum of understanding as well as royalties for transfer or sale.

- Texas Foundation Seed Service, Vernon, TX, (940) 552-6226, <http://tfss.tamu.edu>, (Steve Brown, manager, rsbrown@ag.tamu.edu) maintains small quantities of guar varieties that were bred in the Texas A&M System in the late 1960s and early 1970s (e.g., Kinman, Lewis, Esser). Early 2012 plans include attempting to increase seed supplies of Kinman and Lewis and purify the plants/seeds produced if needed. TFSS does not currently have any seed available for research plots or for production increases.

- Hardeman Grain, Chillicothe, TX, (940) 852-5118, (Mike Phillips, manager) is increasing old Kinman guar seed that had been warehoused for at least 10 years. If production is successful then some guar seed may be available in 2013. No seed is available in 2012.
- Texas Tech University, Lubbock, TX is the owner of two recent guar varieties which are under Plant Variety Protection Act guidelines. Matador and Monument were released in about 2005 and 2009. TTU does not currently have a seed supply, however, there is interest in getting these varieties increased from the small amounts (pounds) that are currently in storage. TTU Plant & Soil Sciences faculty contact is Dr. Dick Auld, (806) 742-5704, dick.auld@ttu.edu

Current Guar Contracting and Production

The 2012 contract guar grain price delivered to West Texas Guar, Brownfield, TX is \$0.35/lb. for #1 grade (was \$0.30/lb. in 2011). An early advance payment on production may apply if planted guar is emerged by a certain date. Contract acreage was about 20,000 acres in 2011, but due to the massive drought in the U.S. Southwest and the fact that most guar is grown without irrigation, there was little 2011 production. Potential contract acreage for 2012 through WTG could be 50,000 acres, but this will depend on other crop prices such as cotton, the lingering drought, the ongoing tendency to choose crops that have crop insurance (not guar), etc.

Demand for guar gum is extremely high due to oilfield fracking needs. Oilfield service companies would like to propel 2012 Texas acreage far higher, well above 100,000 acres, but West Texas Guar is not interested in a one-year massive boost in acreage as they wish to develop consistent production over time among producers who grow regularly. Texas acreage since 1999 has fluctuated from about 7,000 to 50,000 acres, the high years due to buying by Rhodia and a price in the early 2000s that was about \$0.20/lb., but in later years the price dropped to as low as \$0.125/lb., which provided farmers no incentive to contract and grow guar.

Other Texas Guar Activity since 2000

Another entity doing business as Southwest Guar in Brownfield moved a mothballed guar splitter from Kenedy, TX (near the Texas Gulf Coast) to Brownfield about 2001. They received a federal grant to aid in the cost of disassembling and reassembling the equipment, however, they could never get it to run at the efficiency it needed to be (reportedly ~25%) and were unable to solve the problem. The equipment is now owned by C.P.E. Feeds in Brownfield, TX who bought the property and buildings in order to install new equipment then crush sunflower. This old equipment has drawn some interest (early 2011) including a China but remains in Brownfield.

Texas Tech University professor Dr. Ellen Peffley, who headed the guar breeding project in Lubbock, retired several years ago. The dissertation that was produced in the work concluding in 2003 was by Dr. Weixin Liu. His dissertation is restricted at the TTU libraries due to proprietary information, but he did have several research papers published that may offer comparisons among domestic (U.S.) and foreign guar or perhaps the domestic lines (long-time varieties Kinman, Lewis, Santa Cruz, Esser) vs. new TTU varieties Matador, Monument, and other experimental lines.

Dr. Dick Auld, another Texas Tech breeder, who focuses on cotton and industrial oilseeds, was associated with the guar project. Dr. Auld believes the TTU work demonstrated that the U.S. guar varieties in general had higher molecular weight than Indi/Paki material, which led to improved viscosity (desirable), which led to better utilization of guar in fracking gels. Companies in the U.S. have generally stated that Indi/Paki guar may have better gum qualities than U.S. grown guar, but this may depend on the end use. I don't know if the same properties would be desirable in foodstuffs.

Suitability of Guar Production in the Southwest U.S.

Guar is as heat tolerant and drought tolerant as any crop as you can grow in Texas. The yield potential and gross income potential do not match other crops because in part guar 1) is much cheaper to produce (so consider the net return, rather than the basic ability to generate gross revenue for a farmer), and 2) guar does not respond as well to inputs like irrigation and fertilizer as corn or cotton or sunflower. But it is a cheap crop to grow, and that alone merits consideration. Guar is suited to marginal quality farmland including sandy soils. Numerous farmers have commented how they like the condition of their land after growing guar, and guar is a good rotation with any crop including cotton and grain sorghum. One hindrance is that guar requires grain harvest equipment (a combine) which most cotton farmers in West Texas do not have.

Immediate research needs in the U.S. to support current guar production include: 1) completion of herbicide labeling process for 2,4-DB as an over-the-top herbicide (guar is not well suited to weedy farmland, and there are currently only three labeled herbicides for U.S. guar), and 2) redevelopment of a suitable *Rhizobium* inoculant for this legume crop. Long-term needs for guar are improved gum quality and yield for varieties adapted to the region.

Factors that May Impact Current U.S. Guar Gum Quality

Environment may have some impact on U.S. guar gum quality. We wonder about how the quality might differ from dryland production in Texas where drought stress can be frequent and prolonged vs. the same variety grown with a limited amount of irrigation. Also, we think late-season weather conditions could negatively affect gum properties and molecular weight. We believe that late-season weathering of guar that is left in the field until killed by a freeze in order to harvest, and which may be subject to rainy weather during this time (more likely to the east in the Texas Rolling Plains than in the High Plains region), will likely have more black or darkened seed. This leads to difficulty in splitting (effectively removing all of the seed coat due to changes in seed coat properties, or perhaps cracking of the seed coat), and as a result could diminish gum quality or the ability to obtain higher purity guar gum without seed coat interference.

Potential use of harvest aids, as is frequently conducted in all cotton production, could be applied late in the season (as soon as early to mid-October, depending on local elevation) when little additional yield is being produced due to cool weather. This could lead to harvest several weeks to a month or more earlier.

Guar Production Information Resources

Limited guar production resources from Texas AgriLife Extension Service are available online:

- <http://lubbock.tamu.edu/othercrops> This includes a current PowerPoint on guar production in West Texas as well as an old 1977 'Keys' guar production manual from the Vernon area.
- <http://southplainsprofit.tamu.edu> Extension agricultural economists annually prepare an Excel spreadsheet that includes updated irrigated and dryland guar production budgets for farmers. Farmers can insert their own numbers to calculate potential economic returns.

Contact Dr. Calvin Trostle or others in this summary for assistance for producers, businesses, potential investors, etc. to evaluate guar as a crop or a potential opportunity for involvement.

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