

SWEET SORGHUM



Currently, Yuma County producers are currently seeking alternative cropping systems and sweet sorghum could be one potential crop on the horizon. Sweet sorghum grows well in Arizona because it doesn't require excessive irrigation and can survive long, hot summers. The crop would be grown primarily for ethanol production, the by-products, such as sorghum distillers grain, would also finding a place in the market as animal feed.

Grain sorghum has been utilized by the ethanol industry for quite some time because it yields approximately the same amount of ethanol per bushel as corn. As new generation ethanol processes are studied and improved, sorghum's role may continue to expand. And, sweet sorghum stalks are used for producing bio-fuel by squeezing the juice and then fermenting into ethanol. Texas A&M University in the United States is currently running trials to produce the best varieties for ethanol production from sorghum leaves and stalks in the USA.

The stem juice of sweet sorghum is rich in fermentative sugar and is a desirable alcoholic fermentation material for the production of ethanol. In addition to fermentative sugar, other kinds of sugars are also found in the stem juice of sweet sorghum. The high levels of different sugars in sweet sorghum juice are beneficial to the rate of alcohol production. There are also some ammonia acids and minerals in the juice which allows the sweet sorghum juice to be used for other purposes.

Sweet sorghum is a grass of Old World origin. The name "sweet sorghum" is used to identify varieties of sorghum, *Sorghum bicolor*, that are sweet and juicy. A United States patent officer introduced sweet sorghum to American in 1853. It is a native of Africa, a drought-resistant, heat-tolerant member of the grass family.

The Department of Agriculture conducted numerous experiments on the extraction of sucrose from sorghum and on crystallization of sorghum syrup. It was hoped to reduce reliance on cane sugar imports and on slave-hungry sugar plantations. Farmers in the South and lower Midwest welcomed the cheap, local alternative to extract dry sugar from the syrup. But, it proved too difficult to extract dry sugar from the syrup.

Sweet sorghum syrup was an important sweetener for many small communities well into this century and even today is still locally important. In the 1860's sorghum cultivation was concentrated in the Midwest, but by the 1890's it had become predominately a southern crop. Production reached a peak of 24 million gallons in the 1880's and then declined over the next century in the face of competition from corn-based glucose syrups

Sweet sorghum looks much like corn without the ears. Instead of tassels on top like corn, it has clusters of many seeds. The seeds are small and round about 1/16" in diameter. Each plant grows 6 to 12 feet tall and 1 to 2 inches in diameter at the base of the stalk.

Sweet sorghum is a corn-like plant that can grow as high as an elephant's eye on some of Earth's driest farmland shows promise as a biofuel that would not cut into world food supplies

Sweet sorghum, is a plant which produces a 10-foot stalk that can be turned into ethanol without damaging the food grain that grows at the top of the plant.

Unlike corn-based ethanol, which uses 1.5 times as much energy in its production, sweet sorghum produces eight units of fuel for every unit of fuel used to grow it.

Sweet-stem sorghum has been grown for more than a century in the southeastern United States in small plantings for making sweet syrup.

The sweet-stem sorghum hybrid "Madhura" has been specifically developed for ethanol production, syrup and unrefined sugar production. Ethanol from sweet-stem sorghum could be a viable alternative to fossil fuels, especially for petroleum products as a cooking, lighting and automotive fuel. Sweet-stem sorghum is a multi-purpose crop, yielding food in the form of grain, fuel in the form of ethanol from its stem juice, and fodder from its leaves and grain.

Sweet sorghum is any of the many varieties of sorghum which have a high sugar content. Sweet sorghum will thrive under drier and warmer conditions than many other crops and is grown primarily for forage, silage, and sugar production.

African slaves introduced the crop, which then was known as "Guinea corn," into the United States in the early part of the 17th century. Sweet sorghum has been widely cultivated in the U.S. since the 1850s for use in sweeteners, primarily in the form of sorghum syrup. By the early 1900s, the U.S. produced 20 million gallons of sweet sorghum syrup annually.

Making syrup from sorghum (as from sugar cane) is heavily labor intensive. Following World War II, with the declining availability of farm labor, sorghum syrup production fell drastically. Currently, less than 1 million gallons are produced annually in the U.S. Most sorghum grown for syrup production is grown in Alabama, Arkansas, Georgia, Iowa, Kentucky, Mississippi, North Carolina, and Tennessee. Sorghum syrup and hot biscuits are a traditional breakfast in southern Appalachia.

Sweet sorghum syrup is called "molasses" or "sorghum molasses" in some regions of the U.S., but the term molasses more properly refers to a different sweet syrup, made as a byproduct of the sugarcane or sugar beet production.

Food, feed and fuel are three of the necessities of life but it is not often that all three requirements can be provided by one crop. Sweet sorghum not only provides grain for human consumption and stalks and leaves for fodder, but it is increasingly being known as a "smart" multipurpose crop and is now recognized as a potential crop for the production of ethanol. As a relatively drought resistant crop for biofuel production, it is highly favored for its effective conversion of atmospheric carbon dioxide into sugar, making it a viable alternative to sugarcane or corn for the production of ethanol.

Sweet sorghum is relatively inexpensive to grow with high yields and can be used to produce a range of high value added products like ethanol, energy, and distillers dried grains. The crop can produce over 12 dry tons/acre per year of biomass on low quality soils with low inputs of fertilizer and water.

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