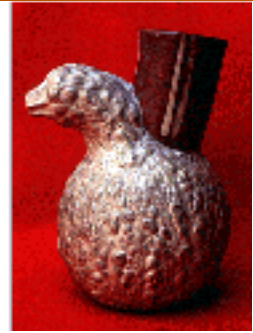




## Ethnobotanical Leaflets



# Sugarcane

By Timothy Braun

Sugarcane is the common name of a species of herb belonging to the grass family. The official classification of sugarcane is *Saccharum officinarum*, and it belongs to the family Gramineae. It is common in tropical and subtropical countries throughout the world. It can grow from eight to twenty feet tall, and is generally about 2 inches thick. Several different horticultural varieties are known, and they differ by their stem color and length (Anonymous, 1998).

The common sugarcane has been cultivated since ancient times. The most widely used form of cultivation is by stem cuttings, since many varieties do not produce fertile seeds (Microsoft, 1994). According to Helen Boyel, (1939) this is one of the many species of plants that would not survive without human intervention. It is a very easy, and profitable plant to grow, but does not naturally reproduce very effectively.

The sugarcane was one of the first "cash crops" of early colonial America. It grew plentifully in the southern states, and was a major source of income for many plantations. It is grown readily in the United States in Hawaii, Louisiana, Florida and Puerto Rico. The countries that produce the largest amounts of sugarcane are Brazil, Cuba, Kazakhstan, Mexico, India, and Australia (Microsoft, 1994).

Sugarcane cannot be easily harvested by machine, so for centuries it has been harvested by hand, using large machete like blades. For this reason sugarcane fields have very large amounts of farm hands, and are a major source of employment throughout South America, Central America, and even the Caribbean. In early America, when the plant was readily harvested, it was a major source of slavery in the south. However, with the advent of abolition, it was found that sugarcane could be imported cheaper than it could be grown (Microsoft, 1994). This is why the sugarcane industry in the United States has diminished so sharply since the Civil War.

The primary use for sugarcane is to process sugar, which can then be used in an infinite number of products. The type of sugar produced by sugarcane is called sucrose. This is the most important of all the sugars. Sucrose is used as a sweetening agent for foods and in the manufacture of cakes, candies,

preservatives, soft drinks, alcohol, and numerous other foods. Although the use of sugar in the human diet is controversial, sucrose supplies about 13 percent of all energy that is derived from foods (Escalona, 1952).

Over half of the World's sugar supply is derived from the sugarcane (Microsoft, 1994). The sugarcane producing countries are not given much credit for supplying the world with a major source of food and nutrition, but they are given plenty of credit for being a world leader in making money. Billions of dollars are generated every year due to the sugarcane plants that are grown in the west alone. Also of significance is the number of jobs that are created every year to harvest the sugarcane plant in small and underprivileged countries (Escalona, 1952).

When sugarcane is harvested it is stripped of its leaves and sent to the sugar factory. At the factory the stems are crushed and shredded by rollers in a process called grinding. During grinding hot water is sprayed over the shredded material to extract the remaining sugar. The solid waste that is left after extraction of the sugar is known as pulp or sugarcane bagasse, which is dried and used as a fuel (Harris and Staples, 1998).

The raw juice is then heated and spun in a centrifuge at nearly 1500 rotations per minute. The centrifuge walls are pierced with small holes through which a thick syrup is forced out. This syrup is called molasses, and is in itself a very valuable product. The molasses, which ironically is a waste product of sugar refining, can be sold as syrup, to flavor rum and other foods, to feed animals, or even as an additive for ethyl alcohol. Molasses is even used in processed tobaccos (Harris and Staples, 1998).

After bagasse and molasses are separated from the sugar, the sugar is sent to the refinery. Here sugar is redissolved, decolorized, and recrystallized into the desired size. After the refinery the finished product is established in the form of powdered, granulated, and lump sugars. Brown sugar is also a product created in the refinery. This is simply sugar that has residual molasses in it. Sugar is not only a well known home food additive, but also plays a large role in industrial fermentation. Sugar is a raw material used in the fermentation of ethyl alcohol, butyl alcohol, glycerin, citric acid, and levulinic acid. Sugar is also an ingredient in many soaps, and can be converted into industrial resins (Harris and Staples, 1998).

The difficulty encountered in getting sugarcane to reproduce has begun to cause a global dilemma. World overpopulation, coupled with an increase in the industrial use of sugar has opened the eyes of many scientists. The demand for sugar is greatly outpacing the ability to produce sugarcane (Lorenzo and Gonzalez, 1998). While this is beneficial to many sugar producing countries, it is tremendously disastrous for the rest of the world. Cuba, for instance, has seen a fourfold increase in the demand for its sugar, but has actually decreased the number of acres in which it plants sugarcane (Escalona, 1962). This is very important, because Cuba is the United States' largest supplier of sugar. Continuing this inattention to the global need for commercially processed sugarcane could lead to a world-wide shortage of this sweet substance.

To help curb the world shortage of sugar scientists have begun cultivating sugarcane shoots in

laboratories using a temporary immersion system. This system allows for a longer growing season for sugarcane, because the shoots could be planted inside, and then planted and harvested earlier. This might allow for two different harvests in one year, which would double global sugarcane production. Also of much importance is the fact that this temporary immersion system reduces planting costs by 46%, and performs similarly to conventionally grown sugarcane. Finally, by growing sugarcane in a sterile laboratory, the amount of time that sugarcane is exposed to the elements is limited, and therefore chance of healthier plants increases (Lorenzo and Gonzalez, 1998). This means less susceptibility to insects, drought, frost, and predators.

In conclusion, there is a great demand for sugarcane in the world's economy because of the demand for sugar, and its byproducts. This demand is not being met by the relatively shrinking supply of commercially grown sugar in tropic regions. If science could continue researching, and enhance the methods used to grow common sugarcane, a global sugar shortage could be averted.

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Last updated: 3-Oct-99 / du