

OPPORTUNITIES AND MANAGEMENT OF SORGHUM AS A BIOENERGY CROP

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ABSTRACT

One of the stated goals of the 2007 U.S. Energy Independence and Security Act was the development of renewable fuel production. Since that time much effort has been made in identifying crops that can be used for biofuel. Over the last few years grain based ethanol, primarily from corn, has dominated the biofuels industry in the U.S. However, a cap has been set as to how much ethanol can be derived from grain. This cap has now been reached, meaning other feedstocks for bioenergy will need to be utilized. There has been much written about the potential of ethanol derived from cellulosic feedstocks, which could potentially come from many sources, but the bulk would come from dedicated bioenergy crops grown on marginal land. Much of the initial focus for bioenergy crops was placed on perennials such as Switchgrass, Miscanthus, Energy cane and Arundo. Although these and other perennial crops will play a large role as bioenergy feedstock, certain annual crops will also make a major contribution. Two of these annual crops are sweet sorghum and high biomass sorghum.

Sweet sorghum and high biomass sorghum are often confused with forage sorghum. Forage sorghum has been grown for many years for livestock primarily as hay, silage or as pasture. For livestock feed, emphasis on sorghum breeding and agronomy was placed on the quality and quantity of forage that could be produced ultimately resulting in high daily pounds of livestock gain on a per acre basis. With sweet sorghum the goal is to grow a plant that produces a lot of juice high in fermentable sugars. The goal for high biomass sorghum may vary depending on the end user. The desire for biopower is to produce a plant that can deliver as many BTUs/acre as cheaply as possible. For cellulosic biofuel production, generally the goal is to produce high yielding plants with readily available cellulose and hemicellulose.

A few of the advantages of using sweet and high biomass sorghums as bioenergy crops are listed below:

- It is much easier for a farmer to commit land to growing an annual crop with a life cycle of less than 140 days rather than a perennial crop that will tie up land for multiple years.
- Sorghum is known to be more drought tolerant than many other C4 annual crops.
- The establishment cost of sorghum is low.
- Infrastructure for handling sorghum seed is already in place.
- Sweet sorghum can easily be substituted for sugarcane feedstock.
- It produces high yield in 120 days compared to months and even years for perennial crops.
- Established agronomy practices for grain and forage sorghum can be adapted for sweet and high biomass sorghum.

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