**Breeding Strategies for Sorghum as a Feedstock**
**for**
**First and Second Generation Technologies for Production of Bioenergy in Brazil**

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Sweet sorghum in Brazil has the potential to be the "safrinha" or second crop after sugarcane to increase the processing period of the sugarcane distilleries (1st generation technology) by an additional 100 days per year. Sugarcane is processed from mid April to December for sugar and ethanol production, remaining idle for approximately four months each year. Sweet sorghum, planted at the beginning of the rainy season in October to December in idle areas of sugarcane renovation can be harvested from February to April and processed for ethanol production prior to the beginning of the harvest of sugarcane. The potential area of sugarcane renovation each year in Brazil is currently 1.8 million hectares which is expected to double during the next 20 years. Utilizing this area with sweet sorghum generates an initial demand for 14 thousand tons of seed which will be very difficult to meet with the use of varieties which require hand harvesting of plants nearly three meters tall. The solution is to develop high yielding, high quality sweet sorghum hybrids which can be mechanically harvested to meet the demand for seed. Currently, sweet sorghum hybrids in Brazil have yield potential of the released sweet sorghum varieties, but are inferior in quality. The lower quality is due the absence of sweet sorghum females and the use of low sugar juicy stem female lines. Breeding strategies and results are presented for improving sweet sorghum stem juice extraction and stem sugar content. The development on "Period of Industrial Utilization" (PIU) curves is presented which are critical for industrial planning for delivery of the necessary quantity and quality of feedstock every day of the 30 to 100 day sweet sorghum milling period. Breeding strategies and initial results for developing very high yielding (50 – 60 t $ha^{-1}$ dry matter) photosensitive sorghum energy hybrids for use with second generation technologies are presented. Strategies for decreasing or increasing lignin content, depending on the processing format, are also presented. Initial results indicate lignin content variation in the whole plant of sorghum from 2 to 10%.