

Economic Assessment of Sweet Sorghum to Ethanol

Explanation and Purpose

In order to promote the use of biofuels several countries have mandated blending of biofuels with gasoline/diesel. Brazil has the highest blending target of 20% in 2013. Most other countries have 10-15% targets by 2020. The major feedstock presently utilized such as sugarcane, corn, wheat and sugarcane molasses are not sufficient to meet the mandatory requirement for bioethanol blending programs. Sweet sorghum (*Sorghum bicolor* L. Moench) is a potential complementary feedstock since it can achieve fuel production along with food security and lower environmental pollution.

Under this project the economic feasibility of ethanol from sweet sorghum was analysed for different scenarios, namely “sweet sorghum stalk”, “stalk + grain”, “grain to food” and “syrup at village level to ethanol at distillery”. For the assessment “low”, “typical” and “high” cases are defined by varying the key production and processing parameters such as feedstock yield, ethanol recovery and per unit processing cost.

The economic assessment of the sweet sorghum to ethanol scenarios, though generally positive, show mixed results. “Stalk + grain to ethanol” (“cane fallow 2020”) and “grain to food” scenarios are economically most viable compared to the “stalk only to ethanol” scenario. A fifteen year cash flow analysis shows that the NPV (Net Present Value) of investment under the “stalk + grain” scenario under “typical” and “high” cases is positive with IRR (Internal Rate of Return) ranging from 70% to 148%. Under the “grain to food” scenario the NPVs are positive with IRR ranging from 67% in the “typical” case to 120% in the “high” case. In the case of “syrup to ethanol” scenario the NPVs are negative in all cases.

Exploitation Strategy

For the use pathways of bagasse the IRRs are higher when surplus bagasse is used for electricity generation compared to its use as feed. However, the use pathway should be determined based on local requirements. Feedstock and processing costs form the bulk of the cost of ethanol production and hence any reduction in cost should aim to bring down these costs.

Further Research

Further analysis will be carried out in future by varying the key parameters related to production, processing and capital cost based on developments in the field.

SWEETFUEL

Sweet Sorghum: an alternative energy crop



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