

Switch Grass – A future Unlock for Biodiesel

Satya Praveen P.¹ and Surya Teja V.²

1 ELP Student, Agricultural College, Naira, 2 ELP Student, Agricultural College, Naira, Acharya N.G. Ranga Agricultural University (A.P)

SUMMARY

The goal of national policy on biofuels-2018 is to enable the availability of biofuels in the market there by increasing its blending percentage. Present blending percentage of ethanol in petrol is about 2.05 and biodiesel blending in the diesel is less than 0.1%. The GOI has posted a target of 20% blending of ethanol in petrol and 5% biodiesel in diesel by 2020. As of bolt out of blue all the global corporates, multinationals acknowledges the production of biodiesel from switch grass. Switchgrass is native to central and North American tall-grass prairie. The plant is an intense biomass producer that reaches a height of 10 feet or more. Due to its high cellulosic content switchgrass is leading input for ethanol production and combustion fuel source for production of power.

INTRODUCTION

Biofuels are carbon-containing energy sources which are highly dependent on solar energy as it captures quantum of light in the process of photosynthesis and stores the energy in the tissues. Biofuels are regenerative, provided sustainable methods are followed for all the agronomic practices of the crop. Ethanol that is used in gasoline engines is obtained by the fermentation of plant sugars and successive distillation of mash to produce alcohol as a fuel. Ethanol is generally produced from crops high in sugars needed for fermentation especially corn and Sugarcane, or from high cellulose containing materials, such as wood by-products or high-fiber grasses, Ex: Switchgrass or from Algae Later on Jatropha plant has come into the scenario for the bio diesel production. But the process of extraction of biodiesel from the Jatropha plant has become cumbersome and tedious. To overcome these limitations “Switch Grass” has become the forerunner to extract biodiesel and also for the production of ethanol. To lower the emissions associated with the burning of any fuel Switchgrass can be directly combusted or fired combined with coal. It is proven that switchgrass can also be grown on soils of moderate fertility without any high application of fertilizers, or with limited inputs. Even single harvest of switchgrass amid late fall or early winter yields the greatest sustainable yields of biomass and good crop stand over years. Switchgrass is tap rooted, has high nitrogen use efficiency and it contains Mycorrhizae that increases absorption of nutrients from the soil. It also prevents the soil erosion and surface runoff by its well established root system.

Present Scenario of Biodiesel Production in India:

India's total ethanol consumption in 2019 is forecast to rise 22 percent to a record 3.8 billion liters. Last year, a record 3.1 billion liters was consumed. The consumption will outgrow ethanol production for the fifth consecutive year, more so due to the high demand of fuel ethanol for blending with gasoline. As a result, supply to industrial and potable sectors will be limited by drop in demand on price sensitivities (illustrated in Figure 4). The ethanol consumption growth (14 percent annual, 5-year average, 2015-2019) is rather strong compared to production growth (8% annual, 5-year average). (Biofuel Annual, 2019). Both have risen, but in response to different drivers: the rise in fuel prices coupled with very attractive purchase price of ethanol is driving ethanol consumption; consecutive year bumper harvests is supporting production growth. Of the total requirement of 3.3 billion liters established by OMCs for marketing year 2019, total ethanol offered by the suppliers (from 21 states) to the oil marketing companies for blending with gasoline was 3.13 billion liters. Of this, some 2.7 billion liters was finalized against which 1.08 billion liters has been supplied as of May 20, 2019.

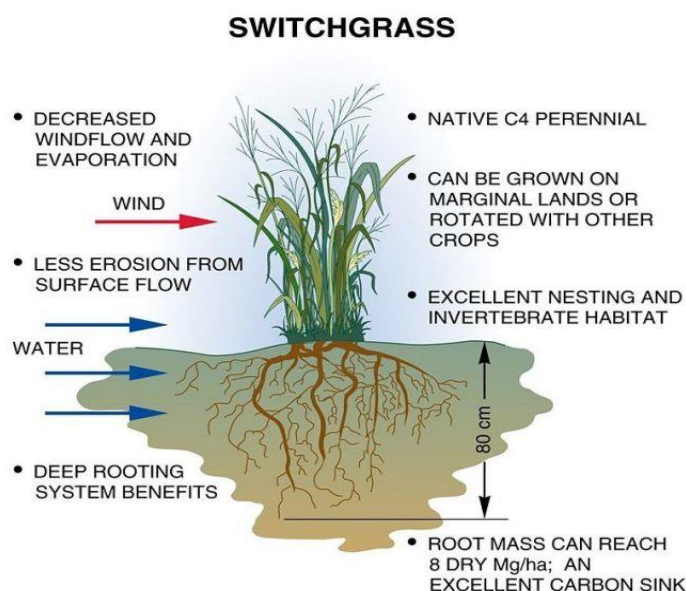
Since the quantity of ethanol demanded at higher prices may be less, the industrial uses and the potable sector will need to augment some of its supply from grain-based distilleries, partly from raw material imports or by directly importing the finished products. 85% of farmers who cultivated Jatropha had stopped, as it didn't reach the standards of farmers' expectations in terms of economic returns (Lixa Axelsson *et. al*; 2012). Poor planning, high cost of cultivation, severe pest and disease attack, low economic returns all these studies clearly contradicts the general statements on Jatropha cultivation.

Scope of Switch Grass:

Switch grass has become a promising source of biofuel with many advantages over incumbent biodiesel production source. Switch grass survives for more than 10 years whereas corn must be sown every crop season. Though from past 5-6 years, there has been much publicity on bioenergy and biofuel, but we are still depending on conventional petroleum-based products as fuels. Lot of research has been done and currently going in the field of bioenergy & biofuels, but still the commercialization of these has not done yet but even though few multi nationals have taken patent rights for the commercialization of switch grass. As to consider both agricultural and environmental issues it is better to shift for perennial grass production of Biofuels, replacing the major row crops with perennial grass that provides agriculture, economic, sociological, implications.

Importance of Switch Grass:

Switchgrass is not only best biomass species for cellulosic ethanol production, but it also possesses some ecological characteristics that make it sustainable. Among its positive qualities, switchgrass offers good pest and disease resistance, It also yields high amounts of cellulose, requires lesser inputs, grass is locally adapted and relatively available, also it has excellent wildlife habitat. One of the major importance of Switch grass is carbon sequestration in its extensive and very deep root system. It has high tolerance and it can be grown even in poor soils and can resist wide variations of soil pH i.e high buffer capacity, drought and flood tolerance and efficient water use in grassland ecosystems. The water consumption per unit energy produced from Jatropha has been reported 1.5 times higher than soybean, 5 times higher than ethanol from sugarcane and maize- (Gerbens –Leenes *et. al*; 2009b). It also does the bioremediation of Polluted soils.



CONCLUSION

The recent adage is “Production of biodiesel from Jatropha is out of sight” and it is now the turn to switch to Switch Grass for switching in the Biodiesel production. As it is economically feasible to cultivate and low input requirement crop, it is much more advised to cultivate Switch grass over other biofuel producing crops. There are many more added advantages when compared with Jatropha so all we need is the government shouldn't hold back to subsidies the pilot basis to the larger extent as we can do most good for the greatest number

REFERENCES

- Lee Rinehart (2006), Switch Grass as a Bioenergy Crop, *ATTRA - National Sustainable Agriculture Information Service*, 1-800-346-9140.
- Kalpana Arora , Satyawati Sharma (2016), *International journal of Phytoremediation*, Bio remediation of Pb and Cd Polluted soils by Switch grass: A case Study in India ; 18(7), 704-709.
- Lixa Axelsson, Maria Franzen (2012) *Wiley Online Library*, Jatropha cultivation in southern India: Assessing farmers experience.