

A Review:

Bio-diesel : An alternate fuel for I.C. engines

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ABSTRACT

There are many tree species which bear seeds rich in oil of these some promising tree species have been evaluated and it has been found that there are a number of them such as *Jatropha curcas* and *Pongamia pinnata* (Karanja) which would be very suitable in our conditions. In India it is estimated that cost of Bio-Diesel produced by trans-esterification of oil obtained from *Jatropha Curacas* oil-seed shall be approximately same as that of petrol-diesel. The cost of Bio-diesel varies between Rs. 16.59 to 14.98 per liter. Assumptions are that the seed containing 35% oil, oil extraction will be 91-92%, 1.05 kg of oil will be required to produce 1 kg of Bio-diesel, recovery from sale of glycerol will be at the rate of Rs. 40-60 per kg, the seed oil cake also yield biogas, which can be used for cooking and residue will be used as a compost. Hence oil cake will fetch good price. Glycerol is produced as a bye product in the trans-esterification of oil. These bye-products shall reduce the cost of Bio-diesel to make it at par with petroleum diesel with volatility in the price of crude. The use of biodiesel is economically feasible and a strategic option. Bio-diesel is domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats or recycled restaurant greases, bio-diesel is safe, biodegradable, and reduce serious air pollutants such as particulars, carbon monoxide, hydrocarbon and air toxics. Blends of 20% biodiesel with 80% petroleum diesel (B20) can generally be used in unmodified diesel engines, Bio-diesel can also be used in its pure form (B100) but it too may requires certain engine modifications to avoid maintenance and performance problem Raw material and its quality for production of biodiesel.

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All life on this earth depends upon energy. Today we live in an age of advancement of science and technology. However, the increasing demand for energy may soon over take all advancement that we have made. Most of our current energy resources are finite and exhaustible. The fossil fuel reserves which are limited and non-renewable will be in short supply by the year 2020.

Increasing population pressure has resulted in the deterioration of natural resources. At the same time, meeting the energy requirement to ensure the nation's economic development is becoming a major challenge. Among the options available to improve the energy situation in the country is the use of tree born oil seed species. India has large arable land as well as good climatic conditions with adequate rainfall in large parts of the area to account for large biomass production each year for the reason of edible oil demand being higher than its domestic production, there is no possibility of diverting this oil for production of biodiesel. There are many tree species which bear seeds rich in oil of these some promising tree species have been evaluated and it has been found that there are a number of them such as *Jatropha curcas* and *Pongamia pinnata* (Karanja) which would be very suitable in our

conditions (Patil and Singh, 1991).

In India it is estimated that cost of Bio-Diesel produced by trans-esterification of oil obtained from *Jatropha curcas* oil-seed shall be approximately same as that of petrol-diesel. The cost of Bio-diesel varies between Rs. 16.59 to 14.98 per liter. Assumptions are that the seed containing 35% oil, oil extraction will be 91-92%, 1.05 kg of oil will be required to produce 1 kg of Bio-diesel, recovery from sale of glycerol will be at the rate of Rs. 40-60 per kg, the seed oil cake also yield biogas, which can be used for cooking and residue will be used as a compost. Hence, oil cake will fetch good price. Glycerol is produced as a bye product in the trans-esterification of oil. These bye-products shall reduce the cost of Bio-diesel to make it at par with petroleum diesel with volatility in the price of crude. The use of biodiesel is economically feasible and a strategic option.

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