

JATROPHA: THE FUTURE FUEL

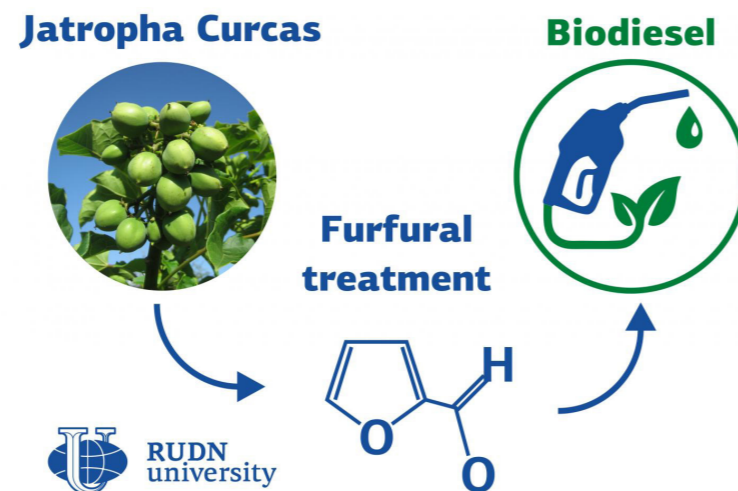
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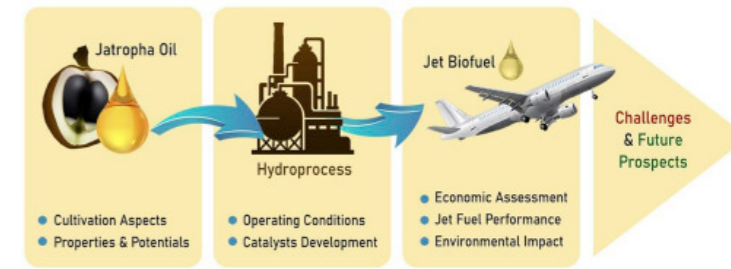
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Jatropha curcas is the most suitable tree borne oil seed plant for biodiesel production. It can be grown in areas of low rainfall (600 mm year⁻¹) and in problematic soils. It is easy to establish, grows relatively quickly, is hardy and can be established from seed, seedlings and vegetative cuttings. It starts to bear fruits within two years and in some cases after one year of planting. One hectare of *Jatropha* plantation will produce 3 to 4 Mt seeds. *Jatropha* removes carbon from the atmosphere, stores it in the woody tissues and assists in the buildup of soil carbon. *Jatropha* has a carbon sequestration potential of 5.50 t CO₂ /ton/year. The seed yield reported for *Jatropha* varies from 0.5 to 12t /ton/year and the tree has a productive life of over 30 years. The oil content in *Jatropha* seeds is around 30-40 per cent with properties such as low acidity, good oxidation stability, low viscosity and better cooling properties. *Jatropha* biodiesel have lesser polluted emissions than the fossil fuel. The fuel production technology is simple and proven technology in Indian conditions. Lack of good quality seeds and planting material, variable oil content are the major problems in *Jatropha* production. *Jatropha* cultivation

can help to increase rural employment and income. They have low gestation period comparative to other non-edible oil sources. It is required in large quantity to sustain a huge demand. The major threats include costly input materials, low support price for seeds and no sustainable procurement mechanism available in the market. The ICAR has identified first ever variety of *Jatropha* SDAU J1 (Chatrapati) which is suitable for commercial cultivation in the semi-arid and arid regions.



BIODIESEL PRODUCTION FROM JATROPHA



The ripe fruits are plucked from the trees and the seeds are sun dried. They are decorticated manually or by a decorticator. To prepare the seeds for oil extraction, they should be solar heated for several hours or roasted for 10 minutes. The seeds should not be overheated. The process breaks down the cells containing the oil and eases the oil flow. The heat also liquefies the oil, which improves the extraction process. The oil from *Jatropha* seeds can be extracted by three different methods. These are mechanical extraction using a screw press, solvent extraction and an intermittent extraction technique viz. soxhlet extraction. The oil extracted can be purified by sedimentation, boiling with water and filtration. Oil is processed by using trans-esterification.

