

Jatropha through the generations

Blending jatropha plant science and bio product technologies for a sustainable green business

Jatropha is here to stay, conquering all of the odds stacked against it. This is a welcome reality.

Crop and agronomic research on jatropha has progressed in a structured way, thanks to the efforts of companies like JOil. The efforts and capital invested in these endeavours have started yielding the desired

outcomes. JOil's pilot jatropha plantation project in Ghana, spread over 500 acres, seeks to capture the entire value chain propositions of jatropha, thus proving the commercial viability and sustainability of the business, even in the current situation where oil prices have loosened up.

It all started with Generation 0 jatropha varieties, which were the wild grown jatropha

types, the seeds of which were used for establishing the large-scale plantations that appeared subsequent to the hype about jatropha in the early 2000s. If there was one major reason for the catastrophic failure of these projects, it can certainly be attributed to the use of unproven wild types of jatropha for establishing commercial-scale projects.

This, combined with the lack of well-researched agronomy practices and understanding of farming systems, led jatropha, through no fault of the crop itself, to become a victim of misleading promotions and unjustified projections.

Understanding the basic realities and foreseeing the need for proven high yielding varieties, JOil commenced



Generation 2 hybrid jatropha



Generation 3 short duration jatropha

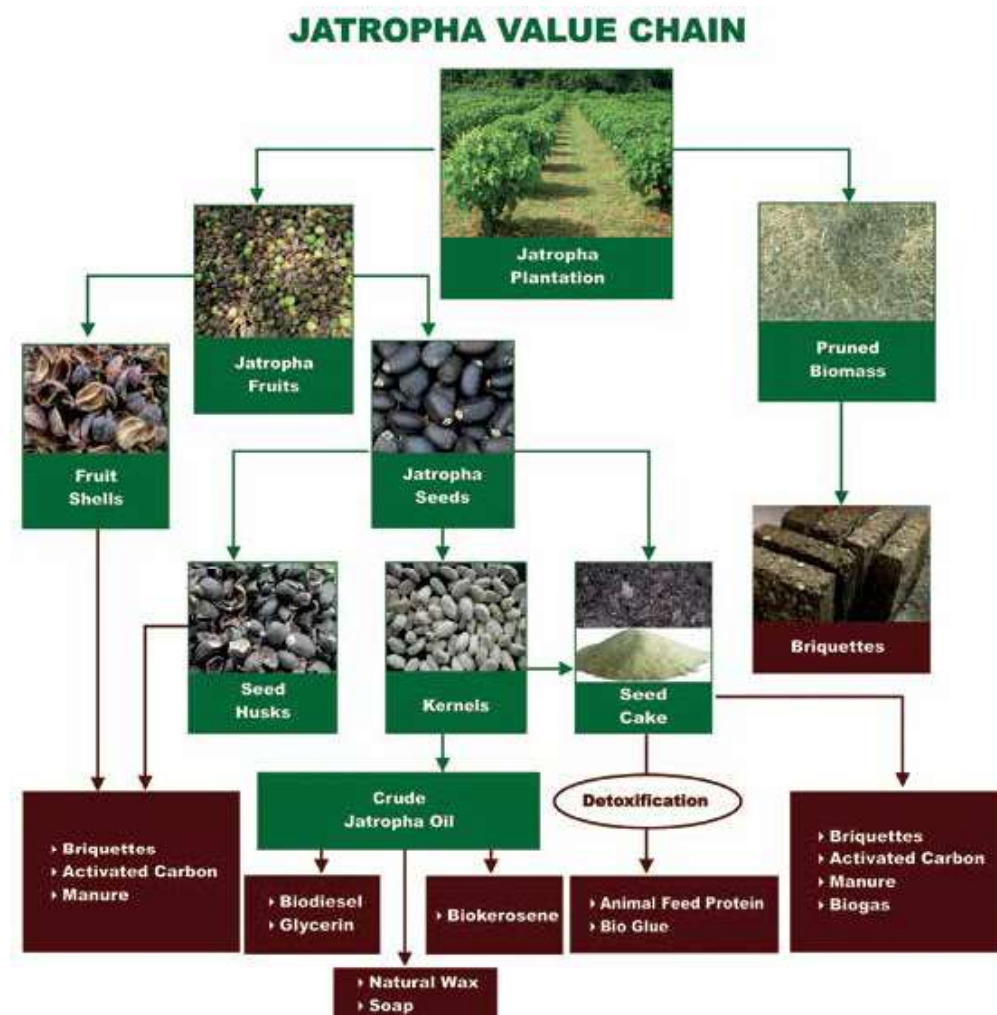
its scientific and structured jatropha breeding program in 2008, which resulted in the evolution of Generation 1 varieties of jatropha, JO S1 and JO S2. These elite varieties were evolved from a mix of promising accessions collected from across the globe, representing a wide range of agro climatic conditions. The yield potential of these varieties is in the range of 4 – 5 tonnes per ha. To further increase the yields, JOil strengthened its breeding programme.

The next generation

Sustained efforts in research and breeding saw the evolution of high yielding hybrids representing Generation 2 in the jatropha business. The hybrids were characterised by their abundant and early flowering pattern, and higher levels of oil productivity, more than 20 – 30%, compared to the Generation 1 jatropha varieties.

Moving into Generation 3 jatropha varieties was interesting because of the evolution of varieties suitable for high density planting. The plants are small statured, amenable for growing as a short duration crop and can be adapted to be grown as a rain fed crop in a wide range of agro climatic geographies.

JOil's Generation 4 varieties are the outcome of its high-end genetic engineering and research programme. JOil, in association with TLL, has developed a genetically modified (GM) jatropha with 75% Oleic acid, compared with the 45% Oleic acid content in other genotypes. The higher Oleic acid content gives a better balance between the cold flow property and oxidation stability in the fuel derived. JOil's GM jatropha with high oleic acid content in the oil has been approved for field trials, the first such approval in the world. Genetic research



is also being conducted on specific traits of jatropha curcas including virus resistance, higher seed oil content, drought tolerance, and a reduced presence of curcin and phorbol esters.

Complementing the crop

of biokerosene, bio-lubricants and natural waxes where the value realisation is higher.

Detoxified kernel seed cake has the potential to be used as a protein source catering to the animal feed industry and in the manufacture of

plantation and processing has the potential to be converted into biogas. The process technologies have been evolved and optimised for commercial scale applications.

Developing plantations with high yielding varieties and choosing the appropriate product mix according to the existing demands promises to make jatropha a highly attractive business proposition and a sustainable green industry. ●

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research was JOil's foray into value addition technologies of jatropha by-products through its own efforts and strategic tie-ups. Producing biodiesel from oil seems to be the basic value proposition when compared to the production

bioglue, which is in demand in the plywood industry. The fruit shells are ideal for producing briquettes with high calorific value and can also be used in the manufacture of activated carbon. The biowaste generated from the

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