



JOil Presentation

2016



*Bioenergy for a
sustainable future*

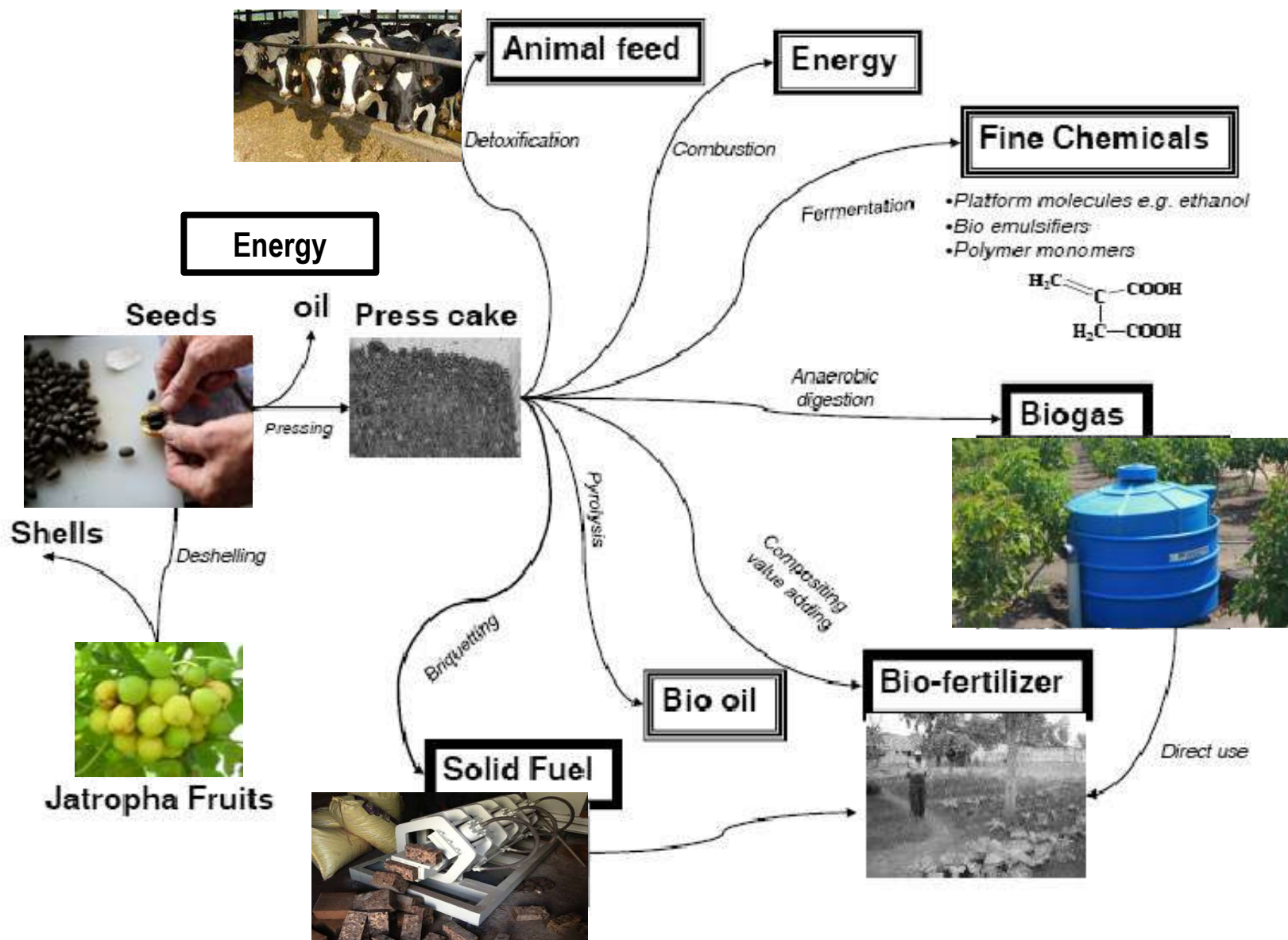
Pioneering Jatropha Plant Sciences

A new sustainable energy crop that has the potential
to replace food crops as a source of biodiesel.

▶ [view expertise](#)



Jatropha – A Good Bioenergy Option (66% GHG reduction!)





Jatropa Learning Curve



**Low
Productivity
/ Yield**

**Project
Failures &
Investment
Losses**

**Image of
Jatropa**

Jatropa Crop

- Can grow on marginal lands (average fertility, rainfall ~ 1200 mm, temp 12-45deg C)
- Contains seeds with 30% non-edible oil
- Can enhance socio-economic development

**Strong
Advantages**

**Soaring
Global
Biofuels
Focus**

Large scale Investments

- Using wild varieties
- Bad Agronomy practices
- Unsustainable business models
- High expectations



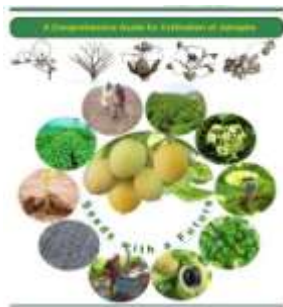


Jatropha has significant potential if pursued in the right way



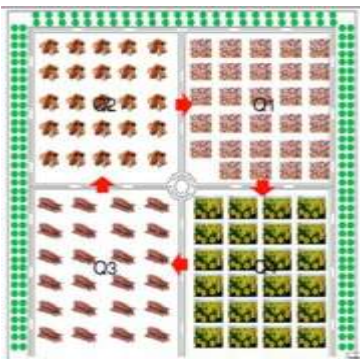
High quality planting material

(Major impact on the overall economics of Jatropha)



Suitable package of agronomy practices & crop care

(Jatropha is sensitive to local conditions)



Sustainable Plantation & Farming Model

(Intercropping / Nucleus-Plasma)



Byproduct development

(Seedcake, Briquettes, Biogas)



Value chain focus

(CJO or Biodiesel)

TLL/JOil Shareholders saw an opportunity to create a plant science based business model and set up JOil in 2008 to develop and sell elite seedlings



TLL/JOil Has Progressed Well On Jatropha Plant Science

Germplasm Collection

Collected natural accessions from different parts of world

Breeding & Genetic Modification

Strong pipeline of varieties

- Increased productivity
- GM
- High Oleic acid content
- High Oil content
- Disease resistance

New traits

- Drought resistance
- Annual crop

Propagation

Seed derived seedlings

Nursery technology

Tissue culture

JOil's proprietary technology

Hybrid seed tech

Field Trials & Agronomy

Successful field trials in India and SE Asia

Customized agronomy manual

Value Creation

Ensure viability through higher yields

Seed cake detoxification technology for animal feed



JOil's detoxification technology could be a game changer

Jatropha
Plant With A Future

15 November 2012



Indeed in this respect JOil is peerless; it has invested more in pure research and enabling technologies than its peers, it is alone in developing GM material and in developing industrially scaled propagation techniques and is the first of the breeder developers to produce an interspecies hybrid for expected commercial release...

JOil is outstanding for the breadth and depth of its research & development activities

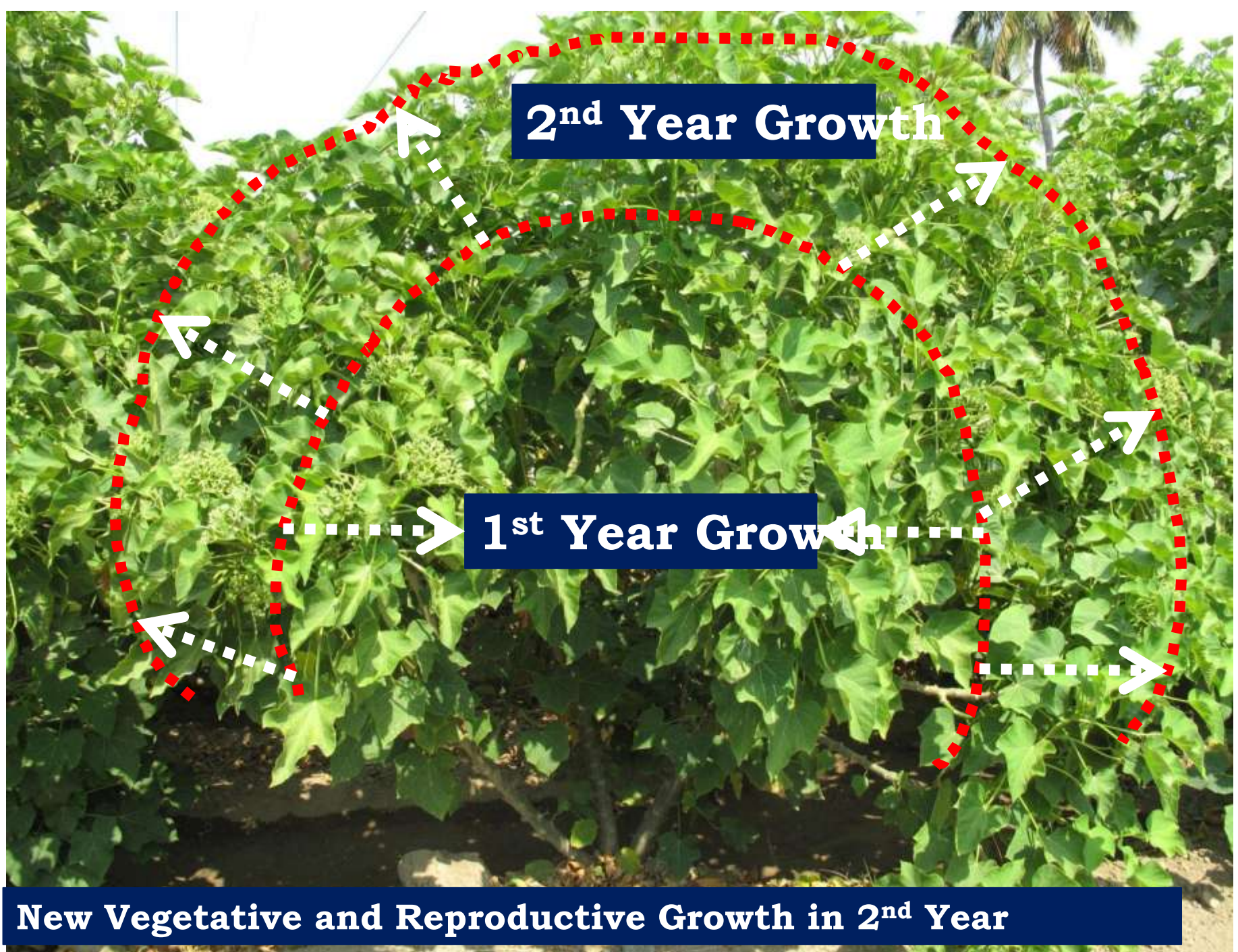
6 Months After Planting



Flowering and Fruiting



Flower & Fruit Bunches



2nd Year Growth

1st Year Growth

New Vegetative and Reproductive Growth in 2nd Year



Successful Field Trials In India



Self branching



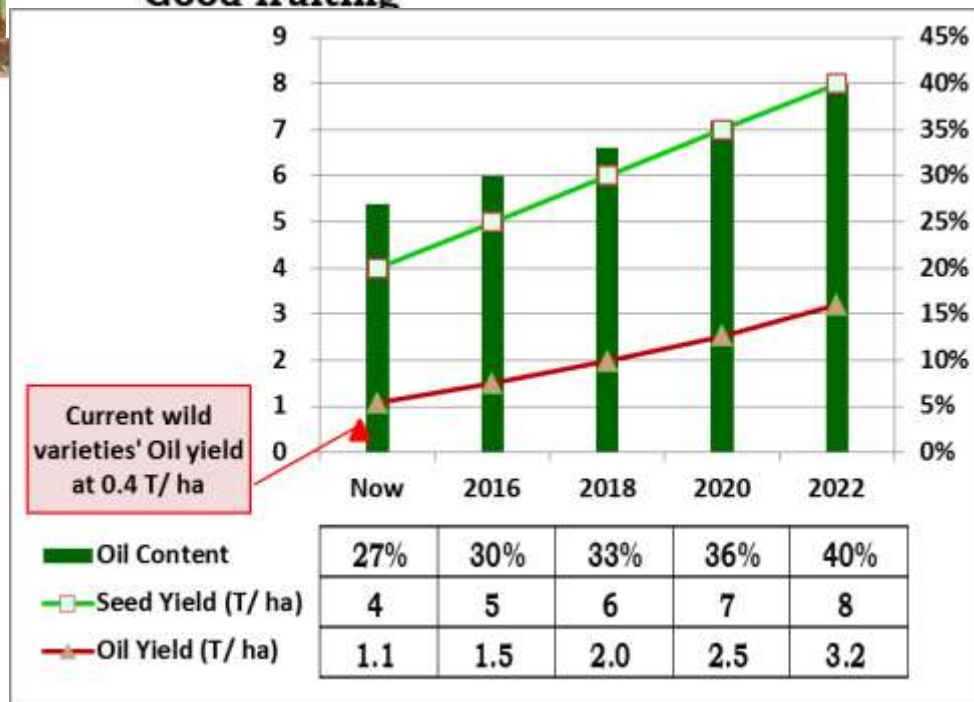
Early Flowering



Y1 : >2 tons
Y2 : ~ 3 tons
Y3 : 3.6 tons

**JOil's
Vision**

Good fruiting



Energy generation from Jatropha by products : Briquettes



Biomass Briquettes

- Fruit shells 34%
cellulose 10%
hemicellulose &
12% lignin
- CV 3,000 to 4,000
kcal/kg





Business Model of JOil

Current

Planting Material & Agronomy Player

- Sale of elite Jatropha planting material
- Agronomy advisory to the plantations

To develop and improve current products & services

- Improved hybrid varieties
- GM Jatropha
- Technology development
- Building Plantation knowledge base

Plan

Integrated Value Chain Player

- Sale of Jatropha derived products – CJO, Seed Cake, Animal Feed, Briquettes, Biodiesel, Glycerin, Intercrops
- Investment (in kind) in Jatropha projects

Planting Material, Agronomy & Technology Player

- Elite Jatropha planting material
- Agronomy Advisory
- Pre-plantation consultancy & Feasibility studies
- Plantation Management consultancy
- Comprehensive Lab analytical services



Initial Scaling Up : West Africa

Need for energy

- Land locked country with no energy resources and all the liquid fuel is imported
- 90% of the cooking oil comes from non sustainable forestry & 80% of electricity comes from imported diesel
- Only 20% population has access to electricity

Suitability of the region:

- Availability of cheap, good quality land
- Dry Climate with rainfall of 800mm
- Low cost labour

Benefits to Community

The project will generate

- Energy resources for local population
- Increased food production
- Employment opportunities
- Contract farming opportunities



Post transplantation Growth and Flower initiation



Plants show normal growth and flowering



General overview of Block I



Plant establishment in Block I



New shoots



Fruits





Plant establishment in Block II



New shoots



- ***Unique Business Model***
 - ***Agro-forestry***
 - ***Complete value chain with by products***
 - ***Inclusive approach with involvement of community***
- ***Strong Science***
 - ***Plant Science : Breeding, Tissue culture, GM, Agronomy***
 - ***Products / By products development***
 - ***Proven results***
- ***Responsible Care***
 - ***Environment & social sustainability***
 - ***Economic model for farmers***

Thank you

www.joil.com.sg



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