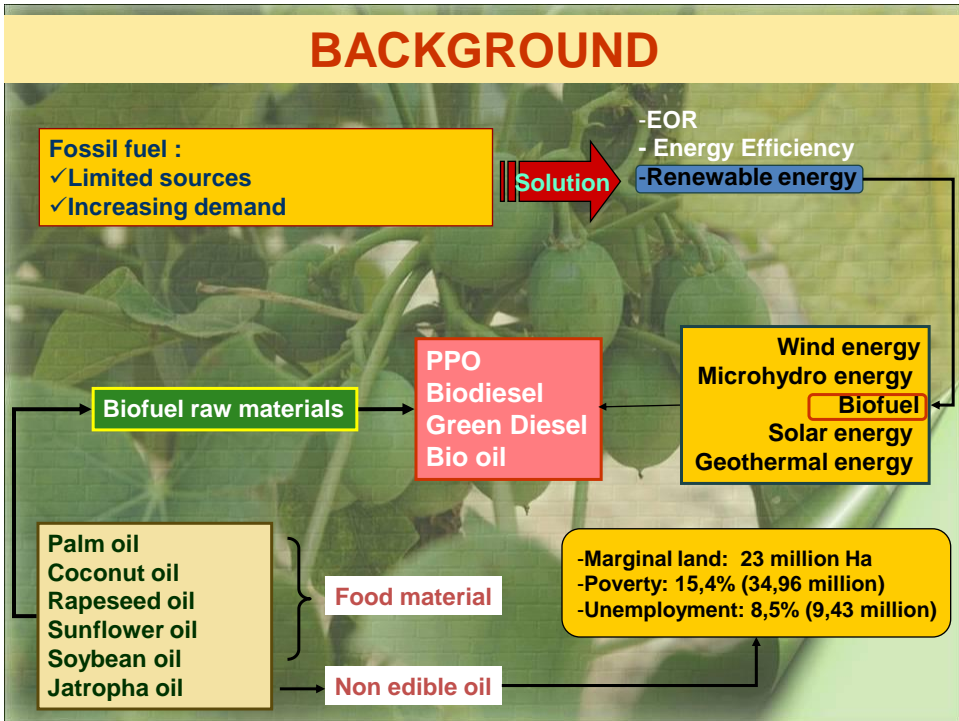


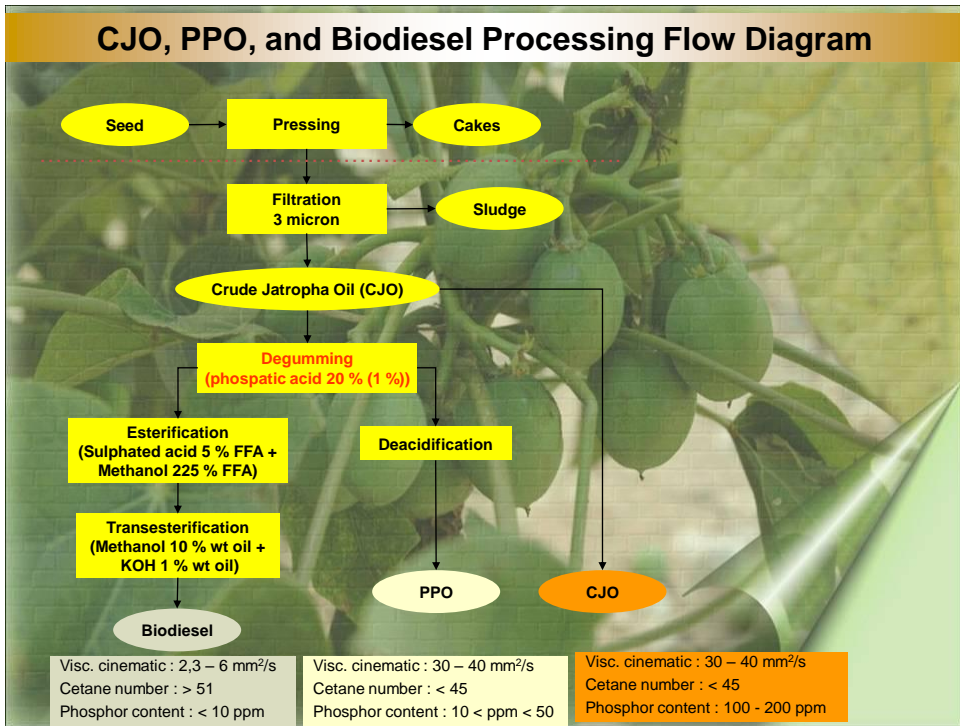
JATROPHA FOR FUEL

Dr. Ir. Erliza Hambali
Surfactant and Bioenergy Research Center- Bogor Agriculture University

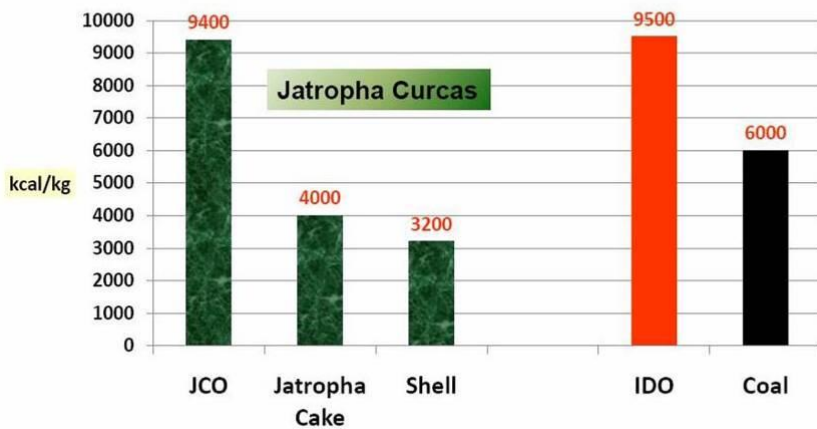



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HEAT VALUE OF JCO vs IDO & COAL

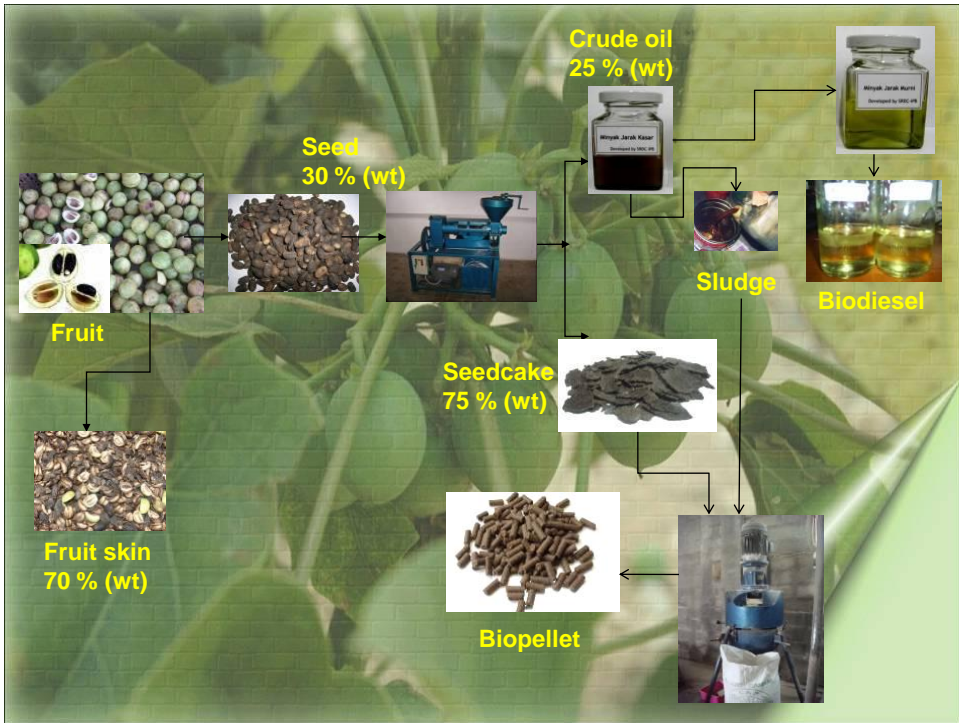


Utilization of Jatropha Cake

Crushing Machine

Mixing Machine

Molding Machine



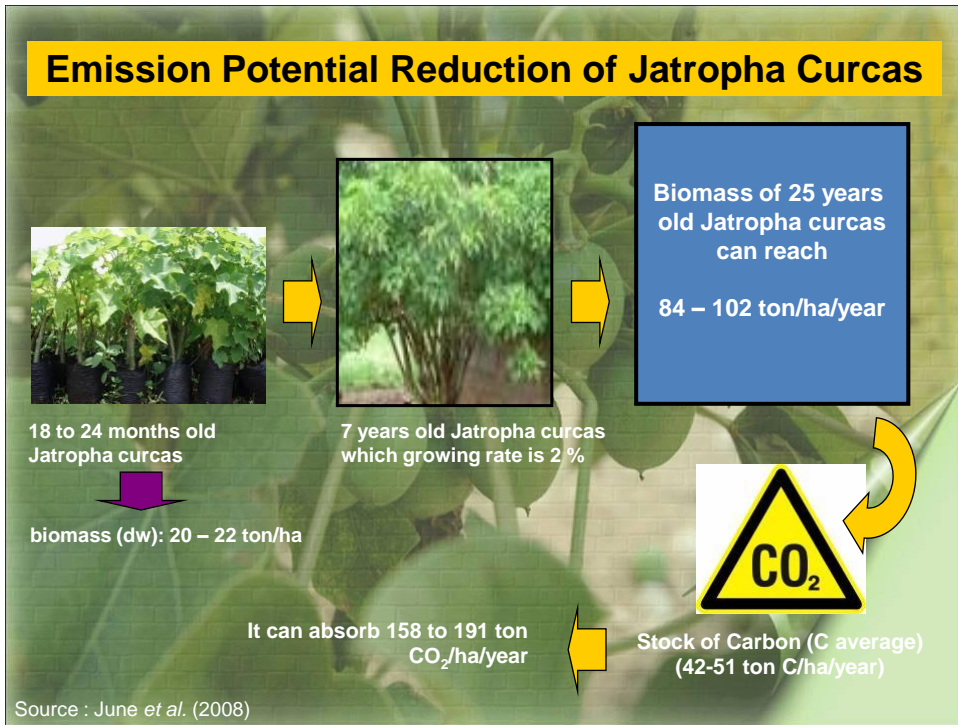
Growth Requirements

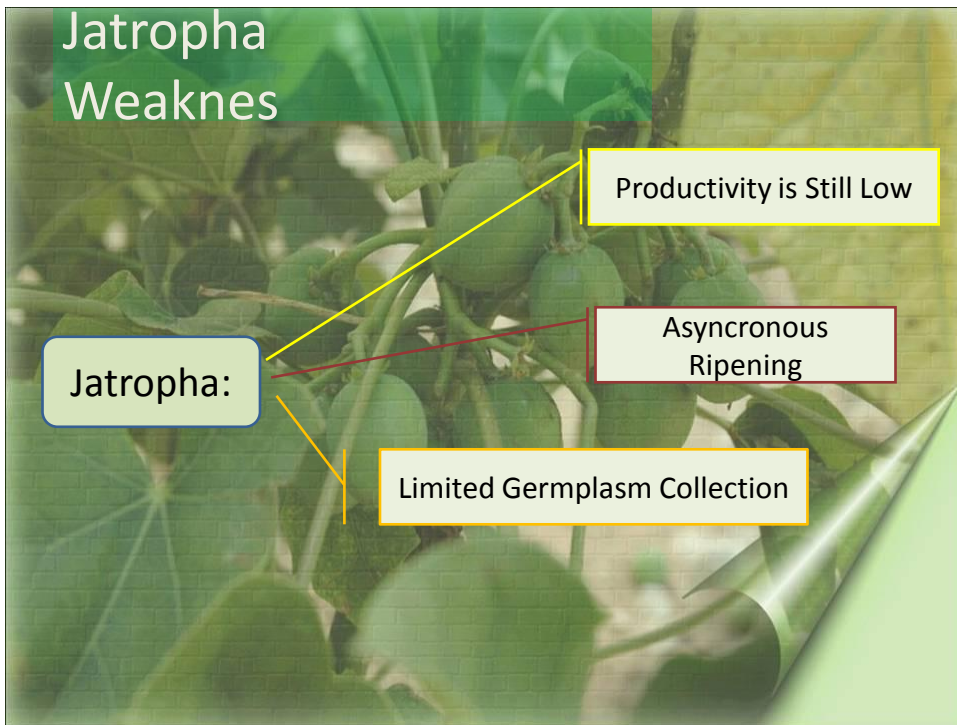


- Grow well in lowland up to 1000 m above sea level,
- Grow at rainfall of 300-2380 mm/yr, However, It still can grow at 4000 mm/yrs
- Grow well in porous as well as infertile (marginal) soil,
- Required average temperature is 20-28 °C,
- Requirement acidity of soil between 5 – 6,5
- Can't grow in peat moss land

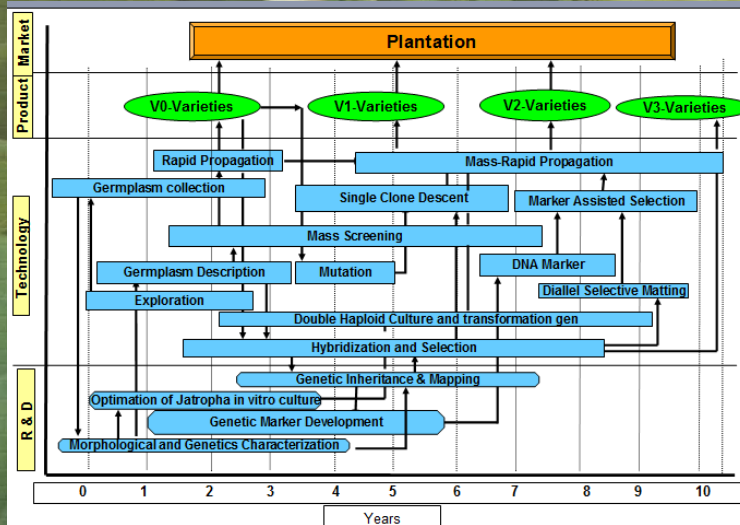
Jatropha Advantages

- Can grow in marginal land.
- Production starts in the first year
- At the age of 5 year seed production estimated 8 tons/ha/year
- Relative resistance to pest and diseases compared to others plant.
- Life span 25-30 years
- Prospective as a new alternative biofuel feedstock





Roadmap of Jatropha Plant Breeding



Researches Series to Develop Plant Breeding

- Capacity Improvement of Genetic Resources
- Single seed clonal descent
- Development of In Vitro Breeding Techniques
- Hybridization, Mutation and Selection
- Genetic Engineering
- Genetic Marker Development
- Multilocation Trial
- Establishment of mother tree plantation for seed and seedling production
- Seed technology

No	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
A.	<i>Capacity Improvement of Genetic Resources</i>										
1	Germplasm exploration and introduction										
2	Germplasm collection										
3	Germplasm characterization										
4	Germplasm Assessment										
5	Trait inheritance study										

No	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
B.	<i>Single seed clonal descent</i>										
1	Single seed clonal descent										
2	Rapid Clonal Propagation										
3	Propagation using tissue culture										

NO	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
C.	Development of In Vitro Breeding Techniques										
1	Optimization of Jatropha tissue culture	■	■	■							
2	Optimization of in vitro regeneration and multiplication of jatropha		■	■	■						
3	Somatic Embryogenesis			■	■						
4	Somaclonal and mutation variations using radiation and EMS					■	■	■			
5	Production of double haploid plant		■	■	■	■	■	■	■		
6	Studies on plant-ecophysiology	■	■	■							
7	In vitro preservation								■	■	

NO	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
D.	Hybridization, Mutation and Selection										
1	Studies on pollination pattern of jatropha plant	■	■								
2	Parrental assessment for specific traits	■		■		■					
3	Hybridization		■	■	■	■	■				
4	Selection			■	■	■	■	■			
5	Diallel selective mating		■	■	■						
6	Mutation					■					

No.	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
E.	Genetic Engineering										
1	Studies on genetic engineering of of jatropa										
2	Identification of apomictic genes										
3	Identification of flowering induction genes in Jatropa										
4	Agrobacterium transformation for somaclonal variability										
5	Genetic transformation										
F.	Genetic Marker Development										
1	Population establishment										
2	Genetic marker application										
3	Linkage analysis										
4	QTL application										

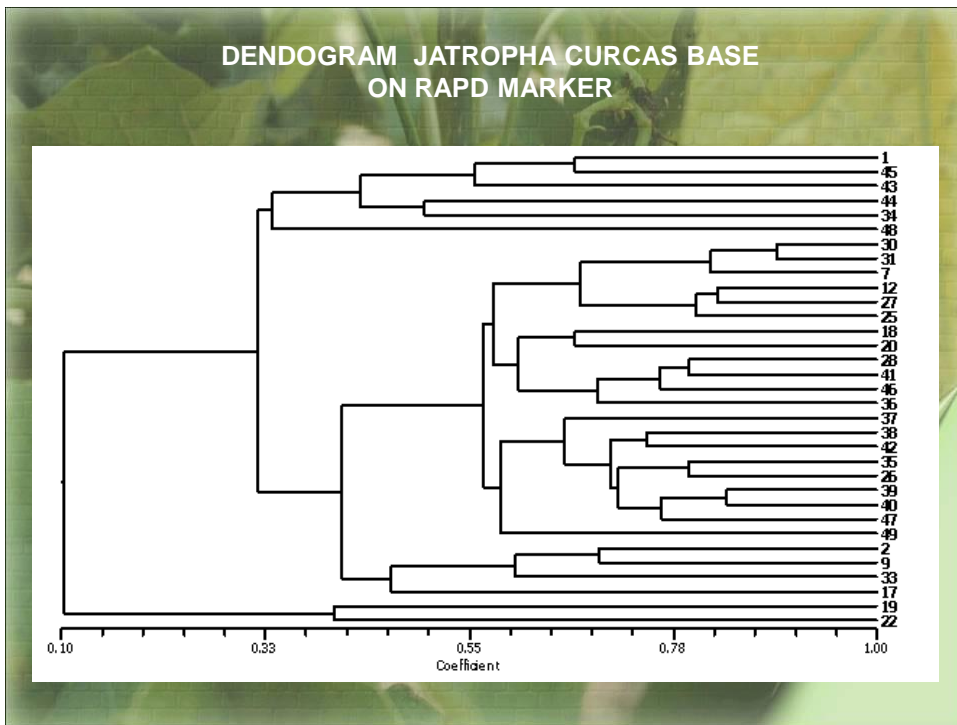
No	TIME TABLE FOR RESEARCH IN JATROPHA BREEDING SBRC-IPB										
	RESEARCH	Year									
		1	2	3	4	5	6	7	8	9	10
G.	Multilocation Trial										
1	Stability and adaptability analyses of potential superior variety jatropa in some areas in Indonesia										
2	Adaptation test of hybrid jatropa										
3	Stability analysis of products of several population of jatropa by using an <i>Additive Main Effect Multiplicative Interaction (AMMI)</i> method										
H.	Establishment of mother tree plantation for seed and seedling production										
1	Mother Tree Plantation Establishment										
2	Seed and mother tree plantation certification										
I.	Seed technology										
1	Seed maturity level Vs Viability										
2	Seed extraction method										
3	Seed drying method										
4	Seed storage method										
5	Seed transportation simulation										
6	Germination Standards										

CHARACTERISTICS OF JATROPHA CURCAS COLLECTION OF SBRC - IPB

Genotype	Number of Male Flower	Number of Female Flower	Ratio of Female Flower and Male Flower
Palembang	7,00	1,00	0,14
Lampung I	14,33	4,20	0,29
IP-1P	18,30	6,43	0,35
Purwodadi	14,00	3,00	0,21
Maros	7,00	4,00	0,57
Lombok	25,80	3,60	0,14
Gunung Tambora	16,60	2,80	0,17
Dompu II	30,50	4,50	0,15
Bima 1	18,00	4,00	0,22
Kupang	25,00	5,50	0,22
Sumba	23,30	4,30	0,18
Papua	15,20	5,20	0,34
Cina	16,80	2,60	0,15
Malaysia, Karechi	20,20	2,80	0,14
Luwu Timur	23,80	2,80	0,12
Makasar I	2,75	5,60	2,04
Medan	12,88	4,88	0,38
Pontianak	19,83	9,00	0,45

CHARACTERISTICS OF JATROPHA CURCAS COLLECTION OF SBRC - IPB

Genotype	Number of Male Flower	Number of Female Flower	Ratio of Female Flower and Male Flower
Aceh Besar	20,75	4,25	0,20
Pidi, NAD	13,30	5,71	0,43
Lahat, Aceh	12,22	4,55	0,37
Pagar Alam	16,25	4,25	0,26
Indralaya, Sumsel	13,75	3,63	0,26
Yogyakarta	15,70	6,86	0,44
Palembang I	20,00	6,22	0,31
Curup	12,75	5,50	0,43
Gorontalo	27,67	6,33	0,23
Komering	20,86	6,14	0,29
Lampung II	15,75	5,25	0,33
Average	17,25	4,65	0,34



THANK YOU
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