



***JATROPHA CURCAS* IN SUB-SAHARAN AFRICA: THE BIG ILLUSION?**

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Jatropha curcas L.: the plant

- Perennial small tree
- Tropical conditions :
 - 30°LN – 30°LS
 - High temperatures
 - No frost
- Drought tolerant
- Poisonous
- Wild species
- Widely used, only marginally for energy production!



Jatropha curcas: the wonder tree?

- + Produce high yields of high quality oil even in marginal growing conditions:
 - + has low nutrient requirements
 - + grows well under saline conditions
 - + is drought tolerant
 - + Has high water use efficiency
 - + is tolerant or resistant to pests and diseases



Jatropha curcas: the wonder tree?

- + Has positive environmental impacts
 - + Reclaims marginal soils
 - + Conserves, protects and improves soils
 - + Allows the production of CO₂ neutral bio-fuel
- + Has positive social impacts
 - + Enables local development
 - + Does not compete with food production



The *Jatropha* rush ...





DURABILIS



gembloux
agro bio tech

Our objectives

- + Quantification of the real yield potential of *J. curcas* in different agro-ecological regions of Africa.
- + Selection and multiplication of high yielding clones adapted to the local growing conditions.
- + Development of improved production practices suited to *J. Curcas* (in monocrop and intercrop conditions).
- + Quantification of cost and returns for all the steps of the *Jatropha* chain value.
- + Development of sustainable organisational models of local *jatropha* production and transformation chains.

Localisation of the investigation sites



Senegal

- Bokhol → irrigation
- Bambougar } rainfed
- Dialakoto }



Democratic republic of the Congo



How does jatropha grow?

Senegal river area : Sahelian climate with irrigation

Fast initial growth of the jatropha plants

Favorable growing conditions from mid-December to mid-June



How does jatropha grow?

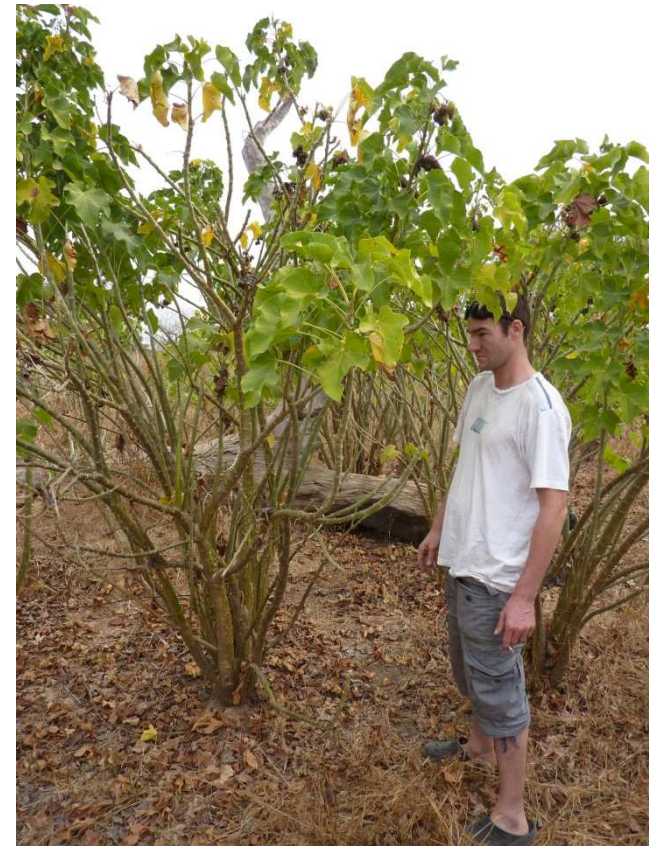
Senegal river area : Sahelian climate with irrigation

- ✧ Unfavorable growing conditions from mid-December to mid-June
 - ✧ December – March : low night temperature.
 - ✧ April – mid June : very hot and dry wind
- **Yield < 500 dry seeds kg ha⁻¹.**



How does jatropha grow?

- + **Southern parts of Senegal**
 - + Very variable growth
 - + Soil characteristics
 - + Rainfall level
 - + Tending practices
 - + Good results with direct sowing
 - + Good results with intercropping
 - + Low impact of pests and diseases
 - + Yields < 2500 kg dry seeds ha⁻¹



How does jatropha grow?

+ Kinshasa area (Bateke plateau)

+ Poor growth

+ High pest pressure

+ Yields < 1500 kg dry seeds ha⁻¹



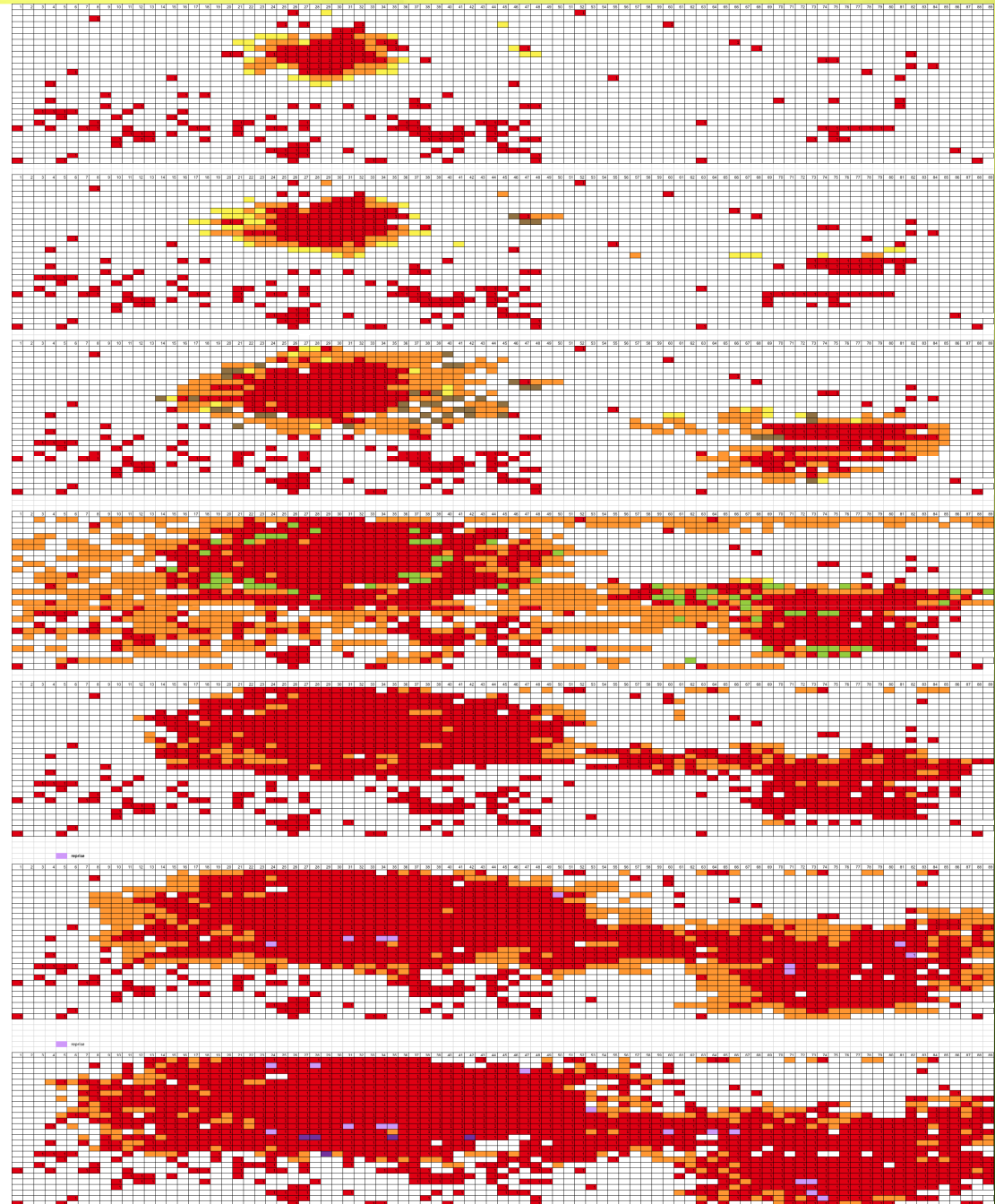
What about the diseases?

+ Fusarium wilt : *Fusarium sp.* section *gibbosum*



Fusarium wilt

Fusarium sp. section gibbosum



What about the diseases ?

+ Fusarium wilt : *Fusarium sp.* section *gibbosum*



What about the diseases?

- + **Fusarium wilt : *Fusarium sp. section gibbosum***
 - + **Presence in Central-Western and Eastern Senegal**
 - + **Much lower impact than in Bokhol**
 - + **Occur mainly at the end of the dry season**
 - + **Recover after the return of the rains in Soudanian zone**
 - + **More problems in dryer areas**



What about pests?

Very strong pest attacks in the Congo.

Intermediate level of pest attacks in the Senegal river area.

Very low level of pest attacks in the Soudanian regions of West Africa.



What about the pests ?

+ *Aphthona* sp. (Coleoptera, *Chrysomelidea*)



What about the pests ?

+ *Calidea panaethiopica* (Heteroptera, Scutelleridae)



What about the pests ?

+ *Stomphastis thraustica* (Lepidoptera, *Gracillariidae*)



Is it profitable?

Sites	Plantation age (year)	Cropping system	Pest and disease pressure	Yield Kg ha ⁻¹ year ⁻¹	Gross revenue (EUR ha ⁻¹)
Senegal river area	4	Pure stand Irrigated	Very high	< 500	< 50
Eastern Senegal	3 - 4	Intercrop Rainfed	Low	500 - 1000	50 - 100
Bateke Plateau (DRC)	6	Pure stand Rainfed	High	800 - 1200	80 - 120

Is it profitable?

Sites	Gross revenue (EUR ha ⁻¹)	Inputs Cost (EUR ha ⁻¹)	Gross margin (EUR ha ⁻¹)	Labour Man.day ha ⁻¹	Labour Revenue EUR/m.d
Senegal river area	< 50	> 500	< 0	30 - 50	< 0
Eastern Senegal	50 - 100	0	50 - 100	25 - 50	2.50
Bateke Plateau (DRC)	80 - 120	20 - 40	60 - 80	90 - 110	0.66 – 0.72

Conclusions

- + The available planting materials of *Jatropha*
 - + do not thrive on marginal land.
 - + are not pest resistant.
 - + do not guarantee high returns.



Conclusions

Jatropha production could be economically, environmentally and socially sustainable if:

- it is cultivated in intercropping systems.**
- improved planting materials are made available.**
- adequate integrated pest management strategies are developed.**





Thank you for your attention

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