Jatropha: Land preparation and Soil requirements

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Soil requirements

Effect of soil type

Jatropha prefers soils with goo
open well-aerated structure.

Slightly coarse soils (sandy clay l
loam)

Heavy soils (clay, sandy clay, clay loam, s
and silt)

Most
suitable under relatively dry conditions

Heavy soils are not suitable under conditions where very dry and wet periods quickly follow each other because they shrink and swell and root formation is impaired.

Effect of soil type

Sandy soils (sand, loamy sand, and sandy loam),

They are prone to drying out quickly

On these soils *jatropha* has a comparative advantage over other crops, because it is drought tolerant.

But these soils are poor by nature in nutrients

Soil requirements

Regardless of the soil type, the soil pH plays an important role in the growth of *Jatropha*, a good pH for *jatropha* lies between 5.5 and 8.5. Under more acidic or alkaline conditions *jatropha* growth is limited.

Soil depth should be at least 45 centimeters and soil slope should not exceed 30°. *Jatropha* can survive at low soil nutrient contents, but in that case growth and production are limited. Higher nutrient levels in the soil translate into increased production. Soil organic matter is also favorable to *jatropha* growth, especially in coarse soils.

Soil sampling and analysis

It is important to have a good indication of the soil type and fertility at the planting site. Before starting a plantation, soil samples should be collected for laboratory analysis.

- Soil samples should be collected at 30 cm depth and per spot (100 m^2) around 10 – 15 samples should be collected of ~100 cm^3 each.
- The samples can be mixed well together to get 1 sample for analysis.
- Per hectare, at least 5 mixed samples should be analyzed.

What should be measured in the Soil samples

physicochemical properties of MuCSAT demonstration field

Sample Depth cm	PH (1:2.5)	EC dS/m	$CaCO_3$ (%)	Cations meq/l				Anions meq/l				O.M (%)	CEC meq/100 g soil	Particle size			Texture
				Ca^{++}	Mg^{++}	Na^{+}	K^{+}	CO_3^{--}	HCO_3^{-}	Cl^{-}	SO_4^{--}			Sand (%)	Silt (%)	Clay (%)	
0-30	8.26	2.20	34.35	13.5	8.92	4.80	3.97	0.00	2.40	3.60	2.40	0.75	3.30	48.75	22.5	28.75	Sandy Clay Loam

Water holding capacity (mm/cm depth of soil)

Depth cm	Field Capacity	Wilting point	Available water	Water holding capacity
0-30	2.80	1.30	1.50	30

What should be measured in the Soil samples

Macro and micro essential elements MuCSAT demonstration field

Depth cm	N (%)	P	K	Cu	Zn	Mn	Mo (MoO_4^{2-})	Fe (%)
		mg/kg						
0-30	0.22	5.01	5.40	3.5	16.20	10.40	0.30	0.80

From the data analysis you can get a good indication about soil fertility (low, medium, high) and the potential of *Jatropha* production at your site.

Field preparation

The soil in the plantation site should be cleared from vegetation before planting, and weeds must be removed

Planting holes

By axe for soft soil surface

By drilling for hard soil surface

Holes for *jatropha* planting should ideally have the following dimensions: diameter of 30 cm and minimal depth of 45 cm. The holes should be refilled with a mixture of soil and organic matter (compost) in a ratio 1:1 i.e., 0.5 kg per hole.

Plant spacing

The commonly applied plant spacing is in a rectangular pattern of 3 x 2.5 meters

Photo from MuCSAT demo-field

Planting time

The best time for planting is at the onset of the rainy season when the soil has taken up the first soil moisture. When water is available at low costs, it is possible to start planting several weeks up to a month before the rainy season. After planting, extra watering to plants is necessary only when the rains are not sufficient, and it can cease (stop) after 3 months of growth when the plants have developed their root system.

Conclusions

1. The soil type and its properties are the limiting factors for succeeding Jatropha plantation.

2. Sandy clay loam is the best soil texture for Jatropha, but sandy soil is not fertile by nature.

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Photo gallery 2013

Last week activity

11:45 – 12:00	**REGISTRATION**	
12:00 – 12:30	PROPOSAL FOR A JOINT PROJECT ON INNOVATIVE PHOTOVOLTAIC SOLAR ENERGY	Professor Franco Porcelli Scientific Attaché, Italian Embassy in Egypt
12:30 – 12:45	**COFFEE BREAK**	
12:45 – 1:05	PRESENT STATUS OF MATS PROJECT	Professor Radwan Hassan Abdel Hamid Faculty of Engineering, Helawn University, Egypt
1:15 – 1:30	EVALUATION OF THE ENERGY CROP JATROPHA CURCAS AS A MEAN TO PROMOTE RENEWABLE AND SUSTAINABLE ENERGY FOR THE MEDITERRANEAN REGION (JATROMED)	Professor Mohamed Rashad Dean, Arid Lands Cultivation Research Institute, City of Scientific Research and Technological Applications

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Thank you