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Research Article

JATROPHA: AN ECONOMIC GROWTH REGULATOR FOR KANDI AREA

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ABSTRACT
Bio Diesel can be a miracle in the field of energy. Jatropha is the plant which can be used to get required quality of the bio diesel. Fuel from Jatropha is cost effective source of energy as well as many way helpful to the farmers. It is a plant of barren lands with very good quality of manure as residue. In this way *Jatropha* is helpful in fulfilling our needs such as fuel, employment, barren land use and manure. Jatropha can act as an important reason for the economic development of poor farmers and common man with approximately 19415 hectare of uncultivated land out of 36919 Hectare of total land of the Kandi Area and other surroundings too with waste land.

Keywords: *Jatropha, Kandi Area, Growth Regulator and Fuel*

INTRODUCTION

Bio Diesel is appearing as a big hope of light to scientist for fulfilling the fuel requirements of the world. Due to limited resources of the fodder fuel, Jatropha is grooming as a big source of fuel of fuel in coming time (Achten *et al.,* 2007). Moreover Bio-Diesel is safe and is need of the hour in this polluted world. In our India too, a successful operation in this path has been completed by the engineers after running a train between Amritsar and Delhi with the help of Jatropha fuel. This plant is of Euphorbiaceous family with fruit containing seed. Each inflorescence yields a bunch of approximately 10 or more ovoid fruits. It is also a leafy plant (Achten *et al.,* 2010).

In Kandi area specifically (area between hills and rivers) which is having more than 50% of the land as barren with soils and climate conditions perfectly best suitable for Jatropha cultivation. Jatropha can act as an important reason for the economic development of poor farmers and common man with approximately 19415 Hectare of uncultivated land out of 36919 Hectare of total land of the Kandi Area and other surroundings too with uncultivable land.

Other Uses of Jatropha

The whole Jatropha plant is very useful. It gives fruit which contains 37% to 60% of the burning fuel depending upon the quality of the fruit and seed. As fuel it is an eco-friendly fuel. It is renewable and sustainable energy (Jain and Sharma, 2010). The residue of fruit after pressing is useful as manure. The manure is of the fine quality. The land and soil quality also improves after the cultivation of jatropha in uncultivated land. The Jatropha plant yield about 500Kg-12000Kg of fruit per year depending upon the quality of the soil (Achten *et al.,* 2010). Jatropha increases the fertility of the barren land as the earth worm activities increases where the leaves of the jatropha are shed (Fargione *et al.,* 2008). Jatropha oil can also reduce the air pollution and can less harm to the Global warming and so is green fuel.

Requirement of Land and Climate Condition

Soil condition required is well drained soil with good aeration and adapted to marginal soil with lowest nutrient contents. It can grow in any poor to poor quality of soil or in even barren land (Bailis and McCarthy, 2011). The requirement of the climatic conditions is very clear as 0-500mtrs of height from the sea level and annual rain fall from 300mm to 1000mm or even higher than this is ok. The required temperature range is 20°-28° (Bhattacharyya *et al.,* 2000).

Land Detail of The Kandi Area:

The area between Shivalik Foothills and rivers are called the Kandi area. In this area the quality of the land is sandy loom and loom. The only 1260 hectare land is of the Silt mixed in GHO village area. The nature of the land is very normal as no alkalinity or acidic affects are present in the nature of the land

[Table1]. Out of total land of 36919 Hectare only 13840 hectare is useful for the low yielding agriculture crops. Therefore the land which is uncultivated is about 19415 Hectare which we can use for the Jatropha Cultivation (Bailis and McCarthy, 2011).

Table 1: Nutrient Contents

Nutrients	Land Percentage with Low Availability	Land Percentage With High Availability
Phosphorous	70%	30%
Nitrogen	60%	40%
Potassium	40%	60%
Acidity	0%	0%
Alkalinity	0%	0%

Table 2: Nutrient Contents in Soil Before the Cultivation of Jatropha (Sinha *et al.*, 2011)

Nutrients	Before Cultivation	After Cultivation
Potassium	25%	27.7%
Nitrogen	18%	19.6%
Phosphorus	28%	30.4%

MATERIALS AND METHODS

Study Site:

Four pieces of lands size: 2250 Sq ft (45ftX50ft) barren land was selected to cultivate in different four villages namely Dorang Khad, Chakkar, Karoli and Lehroon of Kandi Area Tehsil Dhar of District Pathankot.

Methodology:

Simple methodology to grow and watch the growth and product of the plants were used. In second phase the fruit was collected and oil was extracted and its fuel quality was tested by simple method.

Functional Unit:

With the help of two farmers four plots of size 2250 Sq ft (45ftX50ft) were planted with 90 Jatropha plants at each Village in the month of April 2011.it started giving fruits after 806Days.The approximate fruit received from 90plants were 439Kg .The oil received after expelling it was 37Kg of oil. Manure of very fine quality was received 422Kg (Achten *et al.,* 2010; Bailis and McCarthy, 2011).

System Boundaries:

The process was to select the land, engage the farmers, planting the Jatropha, rearing the plants, collection of fruit, transporting to the expeller, collection of fuel and manure and testing the burning strength of the fuel (Fargione *et al.*, 2008).

Inventory Data:

Specific data for the cultivation of Jatropha (*J. curcas*) was collected from the four test plots villages namely Dorang Khad, Chakkar, Karoli and Lehroon of Kandi Area Tehsil Dhar of District Pathankot.

The inventory data production and plantation use was mainly derived from literature. The background data on energy supply, industrial processes, transportation and infrastructure were taken from ecoinvent (Misra *et al.,* 2011).

Environmental Impact Assessment:

The oil recovered from the Jatropha Plant was comparatively environment friendly and was bio-fuel. The manure used from the oil cakes of the Jatropha was not having any side effects (Jongschaap *et al.,* 2009).

RESULTS AND DISCUSSION

The oil recovered from the Jatropha Plant was comparatively environment friendly and was bio-fuel. The manure used from the oil cakes of the Jatropha was not having any side effects.422Kg of manure and 37kg of oil was received from the yield of only 90 plants in 2250sq ft area. This oil is of very fine quality with very good burning flames (Lam *et al.,* 2009). As part of the discussion if the quality of the plantation

is improved and more land may be planted will give better result .This research shows that there is lot of scope of further expansion (Jain and Sharma, 2010; Lam *et al.*, 2009).
The manure received was also send for testing of nutrients which shows the following results Nitrogen: 4.1%, Phosphorous 1.45% and Potassium 1.1% (Bailis and McCarthy, 2011).
As *Jatropha* can be expected to have maximum of 3000Kgm/hectare as standard yield of oil. It is better than as compared to other oil bearing plants like cotton and soybean seed. The expected production of oil is as under:
Total Uncultivated Land X oil/hectare= 19415hectare X 3000Ltr/hr=58245000Ltr (in very Perfect ideal Conditions).

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