83. Bwiru B

# Developing A Machine For Oil Production From Seeds

Njile Dotto, Buteye Dotto and Erick Benjamini

**Introduction:**
A simple machine for oil production from jatropha seeds including separation of oil from jatropha seeds ,the principle is as follow;
A simple machine consist of the following parts and how it works; Piston for compressing the jatropha seeds, cylinder bore of 5cm in diameter and 148cm in height with 1.1cm thickness for the seeds being put and compressed, hole for deliver out of oil, collecting dish for collection of oil from the cylinder bore.

**Methods:**
Construction of machine
Take a cylinder of 5cm in diameter and 14.8cm in height, then close one side of the cylinder with related plate of the same diameter by welding, make the holes at the near the welded plate.Make a piston of 21.6cm in height and 4cm in diameter so that it can fit to the cylinder bore, construct a steel dish/collection tank, hence machine is ready for use.

Jatropha grows in all types of soil (ordinary soil, sandy soil, gravely soil or rock soil) and easily to different climate as follows;
It can survive a long period of drought by shedding most of its leaves.
It can stand up to two years without rain fall.
The tree also has a short gestation period; it will bear several fruits starting at about 8 months old.
It can be adopted to marginal soils with low nutrient content but the use of organic fertilizer would result to higher yield.
It grow better when planted at the onset of the rainy season.
The trees can also be planted on coconut plantation –intercropping the jatropha plant under the coconut trees provided that it receives sufficient sunlight.
Jatropha is a drought resistance perennial shrub with an economic life of to 35 years and can even extend up to 50years.
The seed matures when the capsules changes from green to yellow, finally to dark brown.

JATROPHA PLANTS
Structure

USES OF JATROPHA PLANTS
Jatropha is a potential source of biodiesel for local production to replace a portion of the country dependence on imported oil.
The extracted oil from jatropha can be used in diesel engine.
Using jatropha as biodiesel reduces greenhouse gas emissions.
Jatropha can be groon on marginal and degraded land, thus leaving primary agricultural lands for food crops and at the same time restoring the fertility of this marginal lands.
Jatropha oil can also be used in making soap aside from using the seeds oil as biodiesel.
The leaves can be used for fumigating houses to expel bugs.
The roots, floors and latex of the jatropha plant and said to have medicinal properties.

| Mass in gram | Volume of ethanol used | Volume of the oil obtained ($cm^3$) |
|---|---|---|
| Mass of the seeds used 60g | volume of ethanol used $30cm^3$ | Volume of oil obtained $20cm^3$ |

**Conclusions:**
The mass of seeds used which is 60g mixed with $30cm^3$ of ethanol produced $20cm^3$of oil, ethanol used as the organic solvent and also forms ester with fat acids present in the jatropha seeds.
Since the efficiency of the machine lead to more production of oil low efficiency of our machine lead us to low production of oil also high pressure is needed for compression about 1000psi.
Grinding of the seeds increased the surface area for the solvent to dissolve the oil effectively.
RECOMMENDATION
Modification of the machine from simple machine to complex machine like using electricity to compress instead of human pressure which is very low will lead to more production of oil which will be used extensively instead of kerosene and diesel.

Also as the observation we made that jatropha oil produce less smokes and have a bright frame then it is an environmental friendly, therefore we beg the government to encourage people to cultivate these plants and the government provide support such as fertilizer and tractors so as to increase the production of oil.

**Further information:**
Download at: www.youngscientists.co.tz/posters

**References:**
En.wikipedia.org/wiki/jatropha-oil.retrieved on 14/09/2012 at 10.00am.

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