



## EFFECT OF TIME OF SOWING ON GERMINATION AND GROWTH OF *JATROPHA CURCAS* IN NURSERY UNDER HIMALAYAN CONDITIONS

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**ABSTRACT:** *Jatropha curcas* is an important biodiesel plant which can prove crucial to Indian economy owing to continuously increasing energy demand of the country. The seeds of this wonder plant yield oil suitable as bio-fuel for diesel engines. It is found to grow at various places in the state of Himachal Pradesh at different altitudinal/microhabitat conditions near to habitats. The present study was conducted to determine the effect of time of sowing on germination and growth of *Jatropha curcas* in nursery under lower and mid Himalayan conditions. In lower Himalayan condition sowing was done at weekly interval during February and March. The result showed that effect of sowing time was significant on seed germination but subsequent growth was non-significantly affected by sowing time. Similarly, under mid Himalayan conditions, sowing was done at weekly interval during March, April up to 1<sup>st</sup> week of May. The results of the study indicated that effect of sowing time was significant on seed germination and subsequent growth of seedlings in mid Himalayan conditions. The present study concluded that the best time of sowing of *Jatropha curcas* seeds in lower Himalayan conditions was third week of March and that for mid-Himalayan conditions it was found to be second week of April.

**KeyWords:** *Jatropha curcas*, time of sowing, lower and mid-Himalayan conditions, germination, growth

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*Jatropha curcas* L. is one of the 175 species in genus *Jatropha* of the family Euphorbiaceae. It is

native to Mexico and Central America and was spread over the world by Portuguese travellers (Gubitz et al., 1999). It is a perennial small tree or large shrub and is found to be distributed throughout the tropics and subtropics of Asia and Africa (Mabberley, 2005). It is listed as weed in Australia, India, Brazil, Fiji, Honduras, Panama, El Salvador, Jamaica, Puerto Rico and other parts of the Caribbean. It has the cultivation limits at 30°N and 35°S latitudes. It also grows in lower altitudes of 0-500 meters above sea level. *Jatropha* is not sensitive to day length (flowering is independent of latitude) and may flower at any time of the year (Heller, 1996). It is a succulent shrub that sheds its leaves during the dry season, with deep roots that make it well suited to semi-arid conditions.

In India, it is found in semi wild conditions in the vicinity of villages and is one of the most promising drought tolerant perennial plants. It is commonly known as Physic nut, Ratanjot, Jamalghota, Jangaliarandi or Kala-aranda in this country. There is evidence from northwest India that *Jatropha* is tolerant of saline irrigation water, although yield under these conditions is not documented (Dagar et al., 2006). *Jatropha* can survive with as little as 250 to 300 mm of annual rainfall;

at least 600 mm is needed to flower and set fruit. The optimum rainfall for seed production is considered between 1000 and 1500 mm (FACT, 2007), which corresponds to sub humid ecologies. While *Jatropha* has been observed growing with 3000 mm of rainfall (Foidl et al., 1996, cited Achten, 2008), higher precipitation is likely to cause fungal attack and restrict root growth in all but the most free-draining soils. Optimum temperature for the growth of plant is between 20°C and 28°C. Very high temperatures can depress yields (Gour, 2006). *Jatropha* has been seen to be intolerant of frost. The plant is well adapted to conditions of high light intensity (Baumgaart, 2003, cited Jongschaap, 2007) and is unsuited to growing in shade.

The best soils for *Jatropha* are aerated sands and loams of at least 45 cm depth (Gour, 2006). Heavy clay soils are less suitable and should be avoided, particularly where drainage is impaired, as *Jatropha* is intolerant of waterlogged conditions. Ability to grow in alkaline soils has been widely reported, but the soil pH should be within 6.0 to 8.0/8.5 (FACT, 2007). *Jatropha* is known for its ability to survive in very poor dry soils in conditions considered marginal for agriculture, and can even root into rock crevices. Productivity of *Jatropha* depends on precipitation rates, soil moisture availability, soil characteristics including fertility, plant age and various management factors like pruning, fertilization and disease control.