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Investigation of Biotechnical Conditions of *Jatropha curcas* L. Toward Gradual Harvest Mechanisation

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Abstract

Jatropha curcas L., a multipurpose plant of the tropic and subtopic climate, is a source for manifold products. These days it is in focus as a potential energy crop for degraded soils in India and other similar climates. For a prospective and efficient large scale seed production a gradual harvest mechanisation of the crop is required.

In regard to this, basic data about plant and fruit specific attributes was collected on three plantations of the Central Salt & Marine Chemicals Research Institute in the state of Orissa in India.

First, a grading system to discern the different maturity stages by means of the fruit colour was developed. Hereupon about 1000 fruits from three different localities and genotypes in six stages of maturity were experimentally harvested.

According to maturity, measurements of the retention force, fruit diameters and fruit mass as well as an oil content analysis were practised. Further two experiments with an experimental "coffee shaker", a vibration harvesting device were done.

Based on those data the volume, density, sphericity and terminal velocity of the fruits was determined. A significant relationship of a decreasing retention force during progressive fruit maturity was found. The genotype had no significant influence on the retention force.

In seeds from immature fruits the oil content was significant lower than in seeds out of the ripe classes.

The experiments with the shaking device showed that a harvesting technique based on a vibration method is potential but also causes injuries on the plant and needs further adjustments to the culture.

Keywords: Biotechical conditions, harvest technique, *Jatropha curcas*, mechanisation, vibration

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