State of the art on Jatropha curcas harvesting

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Physic nut (*Jatropha curcas* L.) has obtained more and more attention in the last decade as energy crop, but its diffusion is strictly tied to the improvement of the performance and the cost reduction of its production chain. The harvesting of *Jatropha curcas* L. remains a big constrain for the spread of the species and present several problems, because fruits are in bunches and do not ripen simultaneously. At the present, the harvesting is an energy and time consuming phase, and the identification of mechanical solutions that allow to facilitate the process are limited. Some full-mechanized and semi-mechanized harvesting methods have been developed worldwide with the purpose to optimize the harvesting process, reducing harvesting costs, and make this crop competitive with the other energy crops. This research leads to the identification of the existent harvesting methods, according to the level of mechanization applied: manual harvesting, semi-mechanized harvesting, and full-mechanized harvesting methods. The manual harvesting is the most common and precise harvesting method but also the most unproductive. Mechanical harvesting carried out with modified grapes or coffee harvesters resulted more productive, but requests a high initial investment. The semi-mechanical harvesting method was achieved with shaker tools employed to facilitate the fruit detachment. This system resulted much cheaper than the full mechanized method and quite flexible for small and medium scale applications, but it still requires adjustments for improving the productive performance. This work aims at presenting an overview of the harvesting methods for Jatropha, showing the pros and cons of each system, and highlighting the criteria to be considered for choosing one respect another. The second focus of the research is the logistic of the Jatropha harvesting, which has been described and schematized for each harvesting method identified.