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Performance of *Jatropha* (*Jatropha curcas*) under Different Soil and Climatic Conditions in Kenya

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Abstract

As the world's petroleum fuel records and consumption figures indicate that the peak and depletion of fossil fuel reserves are within a breach of a few spans of years from now, countries around the world are hurriedly developing strategies for on-farm production of renewable sources of fuel from crops. In Kenya, campaigns for the production of renewable green energy has been doubled with the Government, Non-Governmental Organisations and Private Companies emphasising the importance of *Jatropha* (*Jatropha curcas*) as the preferred candidate for biodiesel production. Dry areas are particularly targeted as potential production sites with the argument that *Jatropha* could make use of marginal land not suitable for food production. While this is done, information on the climatic and edaphic suitability of this crop is lacking to smallholder farmers. The study hypothesis was that regions for biofuel production have not been properly identified in Kenya. Therefore the objective of this research was to study the performance of *Jatropha* (*Jatropha curcas*) under different soil and climatic conditions in smallholder farms in Kenya. A survey was conducted in 150 randomly selected farms at the Coast, Central, Eastern, Rift Valley and Nyanza provinces (30 per province) representing typical *Jatropha* regions in Kenya with existing *Jatropha* plantations. Questions on *Jatropha* agronomy, management practices and cropping challenges were asked. An in-depth study of 5 farms in each region chosen randomly was performed to verify the information obtained, taking data on the morphological and yield performance of *Jatropha*, diseases and pests incidences, soil analyses on pH, nitrogen, carbon and bulk density. Climatic data was obtained from meteorological stations in the regions. Results showed that the performance of *Jatropha* was positively linked to humid conditions, well distributed annual rainfall of 500–750 mm, moderately sandy to loam soils, pH close to neutral and good level of management. It was concluded that good management practices together with climatic and soil suitability are important for successful *Jatropha* production. Further, it was evident that not all regions where *Jatropha* is grown and promoted in Kenya could support the crop in terms of climatic and soil requirement without proper crop management practices.

Keywords: Climatic suitability, edaphic, *jatropha curcas*, management practices