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Effect of *Jatropha curcas* L. press-cake and inorganic NP fertilizers on productivity of potato (*Solanum tuberosum* L.) and soil properties

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Low soil fertility is a major constraint to potato production in Ethiopia. A field experiment was conducted at Rare research farm, main campus of Haramaya University in Ethiopia, during the main growing season of 2011 under supplementary irrigation to evaluate the effects of *Jatropha curcas* L. press-cake and inorganic NP fertilizers on the productivity of potato (*Solanum tuberosum* L.) and soil properties. The treatments consisted of four rates of Jatropha press-cake (0, 2, 4 and 6 t ha⁻¹) and five rates of combined mineral N and P (0+0; 0+46; 50+0; 50+46; 100+92 kg N+P, respectively, ha⁻¹) fertilizers. The experiment was laid out as a randomized complete block design (RCBD) in a factorial arrangement and replicated three times. Well sprouted medium-sized potato tubers of a potato variety named Badhasa were planted on 30 May 2011 at the spacing of 75 cm between rows and 30 cm between plants accommodating approximately 44,444 seed pieces ha⁻¹. The plot sizes were 3.75 m x 3.9 m. The distance between plots and blocks was maintained at 1 and 2 m, respectively. All agronomic and soil data were collected and analysis of variance was done. The results indicated that Jatropha press-cake along with mineral fertilizer significantly enhanced potato tuber yields and soil OM. Thus, from the results of the study, it could be deduced that 2 t *Jatropha* press-cake ha⁻¹ resulted in an optimum total tuber yield.

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Commercial demonstration of biorefinery of lipids - Coproduction of bodiesel and 1, 3-propanediol

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L ipase-catalyzed transesterification (also esterification) from oils or fats for biodiesel production has some advantages over Chemical-catalyzed transesterification, such as environmental friendship, lower energy consumption, widely suitable for low quality vegetable oils. However, the low stability of the lipase due to alcohol has been being regarded as the main hurdle to the industrialization of lipase-catalyzed biodiesel production. Tsinghua University has developed a novel process to eliminate the inhibition of methanol on lipase, thus the operational life of the lipase could be improved into more than 300 cycles from several (1-5) cycles while traditional process applied. The patented novel process was successfully demonstrated in a pilot plant (200 kg/day) and commercial plant (20,000 ton/year and 50,000 ton/year) in China. It has also been being demonstrated in a pilot-plan in Brazil. As a by-product, glycerol will be produced at about 10% of biodiesel during the process of biodiesel production. More and more concerns were paid on how to utilize crude glycerol. It could be a promising way to produce 1, 3-propanediol (PDO) by fermentation with crude glycerol as feedstock. PDO is a valuable monomer to synthesize polytrimethylene terephthalate (PTT). PTT has excellent properties for textile fibre or plastic, and it was found to have some better properties than other polyesters such as PET, PBT. Tsinghua University has developed a novel flexible process for PDO production by fermentation from glycerol or glucose, and it was successfully demonstrated in a pilot plant. A facility with capacity of 20,000 tons/year PDO is running in China.

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