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### The effect of organic and inorganic fertilizer on growth of *Jatropha curcas* L. seedling on degraded land Nifas Silk Lafto subcity Addis Ababa, Ethiopia

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*Jatropha curcas* is one of the biofuel plants that can grow on degraded lands for rehabilitation of the soil and to increase biodiversity besides its oil can be used to substitute fossil fuel that cause high environmental pollution and is useful to ease energy scarcity pressure. One of its best properties is to grow better on degraded land with scarce conditions of nutrients. It grows on degraded land with lower efficiency. For better growth results treatments with appropriate amount of nutrient is inevitable. But its nutrient requirements are not known for its efficient growth. Though it had been known it gives different response on different climatic and soil conditions. Therefore this study evaluates the growth performance of the plant by studying its nutritional requirement on degraded land for its efficient growth response. Field experiments were conducted to analyze its growth response to organic and inorganic fertilizers on degraded land. The experiment had been done on degraded land rehabilitation plantation pilot project in Nifas Silk Lafto sub city (NSLSC) Addis Ababa city administration Environmental Protection Authority (AAEPA) on seedlings at the age of nine month after plantation. The selected and plotted 90 samples seedlings of *Jatropha curcas* L. were treated with N (60 and 50 g/plant), P (80 and 100 g/plant), K (75 and 60 g/plant), cow manure (4 kg/plant and 2 kg/plant), compost (2 kg/plant and 1 kg/plant) and biogas sludge (3 kg/plant and 1.5 kg/plant) under normal climatic and soil physicochemical conditions which were considered prior than the treatments. Different morphological growth parameters such as height of the plant (Ht), collar diameter (Cd), canopy height (CaH), canopy diameter (CaD), primary branch (PBr), secondary branch (SBr) and leaf area per plant (LA) were measured to observe the impact the nutrients on growth. The above growth parameters were measured and collected for six consecutive months. The collected and cleaned data were analyzed by Anova, Manova and independent T test. The result shows all the growth parameters are in increasing trend for both organic and inorganic fertilizer applications. The results also revealed that the lowest N level (50 g N/plant) was more successful for rising most of the studied traits i.e. height, collar diameter, canopy height and leaf area of the plant except canopy diameter. Application of P80K75 recorded significantly higher height, canopy height, canopy diameter and collar diameter of *Jatropha*. Among all the treatments combined effect of compost biogas sludge were significant in all growth parameters.

#### Biography

Etsegenet Gebrehana has earned a degree in Applied Biology at the age of 20 from Addis Ababa University and Degree of Master from the same university in Environmental science in 2013. Her curiosity with a big deal initiation has led me to specialize in Environmental science as it deals with providing a broad range of solution for sustainable development, in conjunction with ways of providing energy sources.

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