Soil Fertility Restoration Potentials of Tithonia Green Manure and Water Hyacinth Compost on a Nutrient Depleted Soil in South Western Nigeria Using Zea mays L. as Test Crop

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ABSTRACT
The study was conducted to investigate the influence of Tithonia diversifolia (Hemsley) A. Gray green manure and water hyacinth Eichhornia crassipes (Mart) Solms compost on a nutrient depleted soil—an Alfisol in South-Western Nigeria. The study was carried out at the Botany and Microbiology Department, University of Ibadan, Ibadan, Nigeria. The two different soil amendments in fresh green manure and compost forms respectively (apart from control) were used as treatments in the study. These were applied in sole applications as well as in varying combinations of the different treatments. The organic amendment treatments were compared to unfertilized control in a modified screen house experiment replicated 3 times in a Completely Randomized Design (CRD). The results showed that for all treatments used, Tithonia + Water hyacinth (T+WH) at various combination ratios of 0.5:0.5, 0.25:0.75 and 0.75:0.25 kg were most significant (p<0.05) for increase in status of macronutrient elements Ca, K, Na and P compared to control treatment in topsoil samples. In subsoil samples however, sole application of Tithonia green manure and water hyacinth compost at 1 kg each respectively showed greater significant values (p<0.05) for micronutrient elements Cu, Fe and Zn in amended soil samples compared to control. Of all soil parameters assayed in the study, both ECEC and pH status of amended soils were not significantly changed by treatments with regard to control. Nutrient elements uptake was also significant for maize biomass samples of T+WH treatments in amended top and subsoil samples with regard to control. These observations indicate the high fertilizing potentials of the two organic soil amendments studied; with sound potential for building soil organic matter to adequate levels that will meet nutritional needs of crops as well as improve the nutrient element status of nutrient depleted soils into which such organic resources are incorporated.