

**Use of Humans Urine and Other Soil Amendments in Tomato (*Lycopersicon Esculentum*) and Pepper (*Capsicum Annum*) Production: A Case Study in the Kwaebibirem District**

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**ABSTRACT**

Human urine is a valuable plant nutrient resource however; there is very little information on using urine. This research examined the use of human urine as nutrient source as well as biochar and compost as growing media for tomato (cv M2) and pepper (*Capsicum annum* cv bird eye) production. This was studied under greenhouse and field conditions. It further examined the perception and willingness of farmers, marketers' and consumers to grow, sell and consume vegetables fertilized with urine. The green house experiment was designed using biochar alone and biochar amended with compost (1: 1 v/v) as growing media. It further evaluated different nutrient sources- urine diluted at the ratio 1: 6, 1: 5, 1: 4 urine/water (urine treatments); 30mg N/L, 50mg N/L and 70mg N/ L (inorganic treatments) and water as a control.. Seedlings were dipped into the nutrient solutions until saturation through capillary action for three weeks. Similarly, a pot experiment was carried out under field conditions using a split plot design. Diluted urine (1:4 urine/water ratio) applied once, twice and thrice a week on five different media treatments were evaluated. The media treatments were; (1) Soil + RHB 1:1; (2) Soil + Compost 1:1; (3) Soil+ Compost+RHB 1:1:1; (4) Soil + Compost+ RHB 1:1:2 (5) Soil + Compost+ RHB 1:2:1. Applications of inorganic fertilizer and water were used as controls. Vegetative parameters such as chlorophyll content, plant height, dry matter, stem diameter, number of leaves and root to shoot ratio, yield and yield components were monitored. It was observed that, when biochar was amended with compost, all vegetative parameters increased significantly than biochar alone. For instance, compost amended media increased tomato plant height and root length by 2.4 fold and 3.3 fold while biochar alone increased by just over 100% and 1.2 folds respectively. In the nutrient sources treatments, it was also observed that the shoot dry weight of tomato transplant produced by DU 1:6 (0.46 mg/plant) was comparable to that produced by In-Fert 1 (0.49 mg/plant) and In-Fert 3 (0.42 mg/plant) treatments. In the field, the highest yield 961 g/plant and fruit numbers 60 fruits/plant was in

plants grown in Soil + Compost+ RHB 1: 1:2 fertigated with 0.45 g N/pot. This was 37% and 5.3 fold greater than in the inorganic fertilizer and (water) treatments ( $p < 0.05$ ). Generally, corresponding decreases in yield were recorded with high irrigation frequencies. The questionnaire survey revealed that most respondents were not aware of urine as fertilizer. Farmers were willing to use urine if it will improve agriculture. Marketers were not willing to disclose to their clients if the vegetables are fertilized with urine. Some consumers were willing to consume urine fertilized crop if only it was safe to consume. The study concluded that urine combined with compost and biochar is a good source of plant nutrients, especially nitrogen.

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