

Effect of spent engine oil on the germination and growth of solanum melongena l.(garden egg) –

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Abstract:

Introduction: The effect of spent engine oil pollution on soil properties and germination, growth and development of Solanum melongena was investigated using six treatments (0ml, 20ml, 40ml, 60ml 80ml and 100ml) of the spent engine oil were applied to 20kg of soil in perforated barco bags and the experiment was arranged in randomized complete block design with four replicates. Soil analysis showed that spent engine oil had no effect on the pH and texture of the soil and there is significant difference in the levels of heavy metals (Cu, Mn, Pb, Zn, Cd) in both the polluted and unpolluted soil samples. The result further revealed that the percentage germination decreased as the concentration of spent engine oil increased. Also, the result revealed that plant height, leaf length, leaf area and number of leaves decreases as the concentration of spent engine oil increases.

The purpose of the study is to determine The effect of spent engine oil pollution on soil properties and germination, growth and development of Solanum melongena.

Methods: These include the plant height and leaf number. The plant height was measured from the surface of the soil to the tip of the plant using a meter rule. The leaf numbers were obtained by visual counting of the leaves. All the parameters were monitored and measured at fortnightly interval for twelve (12) weeks.

Results: The test plants (Solanum melongena) were observed with improved growth developments in the lightly polluted wetlands. These improved growth developments in the lightly polluted wetlands were better to that observed in the control (unpolluted wetlands) and these improved growth performance cuts across the different nutrient supplements administered with poultry waste ($50 \pm 0.09\text{cm}/ 36 \pm 0.04$) as the best amended nutrient supplement, followed by sawdust ash ($42 \pm 0.06\text{cm}/ 36 \pm 0.34$) and inorganic fertilizer (NPK) ($40 \pm 0.13\text{cm}/ 29 \pm 0.32$) in the remediated wetlands. Serious adverse effects were

observed with the heavily polluted wetlands on the test plant growth parameters as follows; poultry waste ($31 \pm 0.89\text{cm}/ 23 \pm 0.05$), sawdust ash ($26 \pm 0.25\text{cm}/ 19 \pm 0.07$) and inorganic fertilizer (NPK) ($24 \pm 0.04\text{cm}/ 17 \pm 0.17$). It was only in the poultry waste amended wetlands of heavily polluted wetlands that remediation activities brought the amended soil better than control (unpolluted wetlands) towards the end of remediation. Although, the amendment agents performance are weight dependent. Other amendment agents used in this study were unable to fully remediate the heavily polluted wetlands except for poultry waste.

Conclusion: In conclusion, it is advised that adverse effects caused by heavily crude oil impaction on wetlands against plant growth parameters could be remedied by the addition of appreciable quantity of organic nutrient supplements like poultry waste to boost plant growth performance with an improved soil quality/ fertility.

Keywords Effect, Spent engine oil, Germination, Growth, Solanum melongena.