Environmental Engineering and Management Journal

September 2022, Vol. 21, No. 9, 1579-1588
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu
http://doi.org/10.30638/eemj.2022.140

"Gheorghe Asachi" Technical University of Iasi, Romania

EFFECTS OF SOLID AND LIQUID PYROLYSIS PRODUCTS ON SOIL PROPERTIES AND PLANT GROWTH

Saliha Dorak[1], Barış Bülent Aşık[2*]

[1]Bursa Uludag University Graduate School of Natural and Applied Science, Bursa, Turkey
[2]Bursa Uludag University Faculty of Agriculture, Department of Soil Science and Plant Nutrition, Bursa, Turkey

Abstract

One of the reasons for the decrease in soil fertility is the decrease in organic matter content with agricultural activities. The addition of organic C such as pyrolysis process products has a significant effect on the development of soil physical, chemical and biological properties. In this study, the effects of biochar and liquid organic fertilizer obtained from urban wastes on soil properties and plant nutrient content were compared with NPK fertilizer application. Two different studies were carried out incubation and greenhouse studies. Changes in soil properties and plant growth were determined. According to the results obtained; significant increases were determined in soil pH and EC (electrical conductivity) values, NH_4-N, NO_3-N, available K, Ca and Na content with increasing levels. However, extractable P and DTPA (diethylenetriaminepentaacetic acid) extractable microelement contents decreased depending on the time. The changes in soil heavy metal content were not found to be statistically significant. Increasing application biochar and organic fertilizer levels significantly affected plant dry weight and nutrient content. The results obtained in some of the parameters evaluated were in the same group as the NPK applications. It is necessary to determine the appropriate application levels together with the application of biochar with NPK.

Key words: biochar, fertilizer, plant nutrient, plant growth, soil

Received: April, 2022; Revised final: September, 2022; Accepted: September, 2022; Published in final edited form: September, 2022

* Author to whom all correspondence should be addressed: e-mail: bbasik@uludag.edu.tr; Phone: +90 224 2941540