

THE EFFECT OF DIFFERENT HYDROCHARS ON CARBON DIOXIDE, NITROUS OXIDE EMISSIONS AND PLANT GROWTH

I. M. Mukhina¹, C. Dicke², G. Lanza², D. Kalderis³, J. Kern²

¹ *Agrophysical Research Institute, 14, Grazhdanskiy pr., Saint Petersburg, 195220*

² *Leibniz Institute for Agricultural Engineering, Max-Eyth-Allee,
100, D-14469, Potsdam-Bornim, Germany*

³ *Technological and Educational Institute of Crete, Romanou, 3, 73133, Crete, Greece
E-mail: muhinairina1989@gmail.com*

Recently a large number of studies on the biochar as a soil additive effect on carbon sequestration and soil fertility have been conducted. HTC char or hydrochar (the product of hydrothermal carbonization) as similar to the biochar produced by pyrolysis soil additive is not yet sufficiently studied. Feedstock for HTC char production and processing conditions have a great influence on properties of the final product. The aim of this study was to investigate the effect of processing temperature and further treatment of hydrochar on its ability to reduce emissions of carbon dioxide and nitrous oxide from sandy loam soil. In addition, the effect of hydrochar on plant growth on the example of cress salad was studied. The results showed that increase of processing temperature and subsequent washing of hydrochar with acetone helped to improve stability of the product and reduce emission of CO₂ and N₂O from the soil as compared to the treatment with raw feedstock. Introduction of HTC-char into the soil did not have a negative influence on seeds germination and growth of cress salad.

Key words: hydrochar, hydrothermal carbonization, carbon dioxide, nitrous oxide.