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SOIL MICROBIOTA UNDER THE CONDITIONS OF AN OPEN FIELD EXPERIMENT OF FERTILIZING SOIL BY ENERGY WILLOW

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Abstract

The aim of the work was to study the soil agrochemical indices, soil microbiocoenosis, in case of growing of energy cultures and based on the mineralization coefficient, to make a conclusion on the speed of mineralization processes in the soils under study. In conditions of continuous field experiment (2011 2016), the dynamics of soil microbial associations was studied for willow (*Salix triandra x Salix viminalis 'Inger'*) cultivation with application of experimental fertilizers of different types. In the research fertilizers there were used sulfuric urea, municipal biocompost, municipal sewage sludge compost, rhyolite tuff and willow ash. The soil microbiotic communities analysis was conducted by the method of serial dilutions of soil suspension with the use of differentially diagnostic nutrient media: meat-peptone agar, starch-ammonium agar, Ashby medium, potato agar, Czapek Dox medium, starvation agar, Ploskirev medium. The direction of the microbiological processes in the soils determined.

According to the results, it was established that the most promising for the purpose of improving the metabolic activitiof the soil (in the growth of energy willow) is a municipal sewage sludge compost and a municipal biocompost. In case of the use of municipal sewage sludge compost, the number of intestinal bacteria, ammonifiers, micromycetes and actinomycetes was doubled as compared with the control. In case of the use of municipal biocompost, the levels of microscopic fungi and cellulolytic bacteria doubled, and those of intestinal bacteria and pedotrophs tripled as compared with the control. While calculating the mineralization/immobilization index, it was shown that the most significant deviation from the control plot was found in the rhyolite tuff treated soil – a decrease by 6 times, and in case of willow ash by 2.3 times, which proved the inhibition of mineralization of the organic substances in the soil.

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