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SOIL COVER SPATIAL HETEROGENEITY IN AGRICULTURAL FIELDS OF FOREST-STEPPE ZONE

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ABSTRACT

The article considers the phenomenon of soil cover spatial heterogeneity and its influence on the lands productivity of the Right-Bank Forest-Steppe of Ukraine. The basic patterns of existence and functioning of micro-depressions (potholes) on chernozem soils, directly on the agricultural fields of the research farm «Velikosnitinske» in Kiev region are determined. It has been found that one of the most important reasons of vegetation and crop yields variegation of the experimental farm field crop rotations is that microrelief elements of various shapes and depths are common here. The main factor affecting soils and vegetation is the water regime of such micro-depressions, which differs significantly from the water regime of lowland territories. Depending on the redistribution of atmospheric moisture over the topography of the field, the agroecological condition, properties and biological activity of the soil, the physiological state of the plants vary changing indicators of the size and quality of the crop. UAV (drones), GPS-receiver and satellite images Landsat-8 and Sentinel-2, internet weather service rp5 were the instruments for studying the dynamics of the water regime of micro-depressions and the state of vegetation. It was determined that the uneven distribution of moisture in agrolandscapes leads to the formation of various soil differences and has a significant effect on crop formation and the duration of the growing season of crops. Research results can be used in precision farming and in compiling detailed soil maps. It is proposed to use the identified patterns in the development of technologies for growing crops under conditions of spatial heterogeneity of the water regime of soils.

Key words: soil, water regime, spatial heterogeneity, productivity, remote sensing, agroecological state.