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FORMATION OF MICROBIAL COMPLEX OF THE SOIL IN AGROCENOSE OF SPRING BARLEY USING ECOLOGICALLY SAFE CULTIVATION TECHNOLOGIES

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ABSTRACT

Soil microbiota is one of the most important factors that determine the formation processes as well as the biological properties of the soil. The use of microbiological preparations in modern technologies not only increases the resistance of plants, productivity, and quality of products, but also contributes to the formation of the microbial complex inherent in each plant. The aim of our study is to determine the number of microorganisms of individual ecological and trophic groups of the rhizosphere soil for spring barley plants depending on the elements of the cultivation technology (application of the preparations). The number of the main ecological and trophic groups of the soil during the ontogenesis of spring barley of Sebastian and Helios varieties changes depending on the elements of cultivation technology (application of the preparations), the phase of ontogenesis, as well as soil-and-climate conditions. During the ontogenesis of spring barley plants, the increase in the number of pedotrophic micromycetes was observed. The most of pedotrophic micromycetes was found in the soil were plants of Sebastian and Helios varieties were planted, with the use of Vimpel 2 and the mixture of Vimpel 2 + Oracle multicomplex. This confirms that the soil contains a sufficient amount of organic matter. Also, throughout the vegetation season, the pathogenic mycobiota was characterized by a high number in agrocenoses of spring barley. The variants in which Vympel 2 and mixtures of Vympel 2 + Oracle multicomplex had been used, the number of pathogenic micromycetes in the soil were the spring barley plants were planted decreased significantly. That shows the fact that the preparation Vimpel 2, both individually and in a mixture, is able to protect plants from diseases by improving their immunity. The number of oligotrophic microorganisms was the highest in the control variant, and it was the lowest with the use of all the studied preparation, respectively. The number of humate-forming micromycetes also decreased by 1-1,5 times compared to the one in the control variant. The application of Vimpel 2 and Oracle brought to the situation in which multicomplex significantly intensified the development of ammonification microorganisms. Amylolytic microorganisms and cellulose-destroying micromycetes also increased. These microorganisms degraded cellulose-containing substrates in the presence of enzymes. They don't require a large amount of the nutrients, but thereby provide an opportunity for the development of other micromycetes that absorb hydrolysis products. Therefore, rhizospheric soil under sowing of spring barley plants is able to form a microbial complex that significantly depends on the elements of growing technologies. The confirmed coefficients of mineralization-immobilization nitrogen, pedotrophicity, and oligotrophicity, determined the regularities of the processes of nitrogen mineralization and immobilization as well as the availability of easily digestible organic substances in the soil depending on the elements of cultivation technology (application of the preparation). A clear relationship between the number of micromycetes in the rhizosphere soil of spring barley plants and the value of HTC was determined.

Key words: soil mycobiota, agrocenosis, number of micromycetes, hydrothermal and microbiological coefficients, plant root secretions, elements of cultivation technology.