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Study of the Influence of Biofertilizers on the Productivity of Corn for Grain in the Conditions of the Sumy Region (Ukraine)

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Abstract: Corn (*Zea mays*) is a major crop globally and in Ukraine, used for various purposes including food and industrial products. With the increasing interest in organic farming, the use of biofertilizers has gained attention due to their potential benefits on crop productivity without the use of chemical components. This study investigates the impact of biofertilizers on corn productivity under the specific conditions of the Sumy region. The research was conducted at the Scientific and Educational Industrial Complex of Sumy National Agrarian University in 2022. The experiment included the use of two types of biofertilizers: LEANUM (liquid) and VITAMIN O7 (powder). These biofertilizers were applied through seed inoculation, foliar application, and a combination of both methods. Corn hybrid Euralis Hemingway EC (FAO 280) was used for the study. Key parameters measured included corn productivity metrics such as the mass of 1000 seeds and yield. The application of biofertilizers did not significantly affect the structure of the corn crop, including the number of rows and grains per row. However, the combined use of LEANUM inoculation and two LEANUM foliar treatments resulted in the highest mass of 1000 seeds and the greatest overall yield. This indicates that the integrated approach of seed inoculation followed by foliar application is the most effective method for enhancing corn productivity in this region. The study concludes that while biofertilizers do not significantly alter the crop structure, their use, particularly in combined application methods, can substantially improve the yield and seed mass of corn. These findings support the use of biofertilizers as a viable strategy for organic corn production, contributing to sustainable agricultural practices in the Sumy region.

Keywords: corn productivity; biofertilizers; organic farming; seed inoculation; foliar application