EFFECT OF PHYTOSUBTIL ON PHOTOSYNTHETIC PIGMENTS AND PRODUCTIVITY OF WHEAT UNDER FIELD CONDITIONS

Mykhailo BOHDAN*, Larysa SAFRONOVA
Laboratory of Innovation and Technology Transfer, Zabolotny Institute of Microbiology and Virology of the NAS of Ukraine, Kyiv, Ukraine

*Corresponding author: bohdan_m@imv.org.ua

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Background: Plant growth-promoting bacteria of the genus *Bacillus* are considered promising tools for improving crop productivity under field conditions. However, the effectiveness of microbial biopreparations depends not only on the strain's properties, but also on the dose and application method, which may differentially affect plant growth, grain filling, and final yield components.
Aim of the study: This study aimed to evaluate the effect of the biopreparation Phytosubtil, based on a *Bacillus velezensis* strain, on the physiological traits and yield components of soft wheat (*Triticum aestivum* L.) cv. Zymoyarka under field conditions.
Materials and methods: A small-plot field experiment was conducted on sod-podzolic soil in Kyiv, Ukraine, during the 2024 growing season. Four treatments were compared: water-treated control; pre-sowing seed treatment with Phytosubtil at 2.5×10^7 CFU/mL; pre-sowing seed treatment with undiluted Phytosubtil at 2.5×10^9 CFU/mL, and foliar application of Phytosubtil at 2.5×10^7 CFU/mL. The pigment content in wheat leaves was assessed at different phenological stages using the BBCH scale, and yield structure was determined at full maturity.
Results: The response to Phytosubtil strongly depended on the treatment regime. The most consistent positive effects were obtained with the 2.5×10^7 CFU/mL treatment, particularly when applied foliarly, which improved chlorophyll-related characteristics and assimilation activity. Among the yield components, the strongest effects were observed for grain number and grain weight per spike. Foliar application resulted in the highest grain weight per spike (0.99 g) and thousand-kernel weight (30.27 g), compared with 0.94 g and 26.13 g in the control. Thus, under field conditions, Phytosubtil was most effective when applied as a foliar treatment at 2.5×10^7 CFU/mL, whereas increasing the dose for seed treatment did not provide additional benefits.
Conclusions: The effectiveness of Phytosubtil in soft wheat cultivation was determined by both application method and concentration. Foliar treatment at 2.5×10^7 CFU/mL proved to be the most efficient regime, enhancing physiological performance and improving key yield components. These findings indicate that optimized foliar application of Phytosubtil may represent a practical strategy for increasing wheat productivity under field conditions and highlight the importance of optimizing the application strategy when using *Bacillus*-based biopreparations in wheat cultivation.

Keywords: *Triticum aestivum* L., Phytosubtil, foliar application, pre-sowing seed treatment.