

IMPACT OF HUMATES AND *BACILLUS SUBTILIS* No. 2 ON THE BIOPHYSICAL PARAMETERS OF WHEAT PLANTS UNDER NI-STRESS

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The research includes a series of vegetation experiments based on the study of impact of humic preparation "Stimulife" and bacteria *Bacillus subtilis* No. 2 on the biophysical parameters of wheat plants at a toxic concentration of nickel ions (10^{-4} M/l). During the study, data on the biometric and biophysical parameters of seedlings of wheat (*Triticum aestivum* L.) of variety Leningradka were obtained (root and shoot length, longitudinal (δl) and lateral elongation ($\delta D/D$) of cell walls and hydraulic conductivity of membranes (L_p) in various experimental variants with the addition of NiSO_4 , humates and bacteria *Bacillus subtilis* No. 2 (titer $3\cdot 6\cdot 10^6$ CFU ml)). The changes of the biophysical parameters in experimental variants were analyzed. It is established that there is an interrelation between the studied parameters under the influence of Ni, humates and bacteria. The correlation coefficient between the hydraulic conductivity and the lateral elongation of root cells is 0.8, and between the longitudinal elongation and the length of the roots is 0.7. It was found that bacteria and humates had a positive effect on the parameters of wheat plants under oxidative stress. On the 2nd day in the variant with nickel, humates and *B. subtilis* No. 2, the length of the roots and shoots exceeded the control treatment values by 1% and 8%, respectively. On the 2nd and 6th day, the length of the roots and shoots in the variants with nickel, bacteria and humates was consistently longer than in the variant with nickel. It is revealed that bacteria and humates contribute to the adaptation of plants to stress and the activation of their protective functions.

Key words: *Bacillus subtilis* No. 2, humates, nickel, wheat, hydraulic conductivity.