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INFLUENCE OF BIOLOGICAL PREPARATIONS ON RESTRICTING THE DEVELOPMENT OF SOYBEAN PHYTOPATHOGENS

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Soybean infection by phytopathogenic organisms causes significant yield losses and a decrease in seed quality. The leading method of protecting soybeans from diseases is chemical using fungicides. However, the ecological situation that has developed in Ukraine requires the search for alternative, environmentally safe methods of controlling phytopathogens.

In this regard, the aim of our work was to study the protective effect of some biological preparations against soybean pathogens.

Materials and methods of research. To achieve the set goal, we conducted laboratory and vegetative experiments. In the spring, soybean seeds of the Arnica variety were sown in prepared pots in a greenhouse. A total of 7 variants in 4-fold replication. When 2-3 true leaves were formed, plants were sprayed with solutions of biological preparations. These preparations were made on the basis of various bioagents: *Bacillus subtilis*, *Pseudomonas*, *Streptomyces* and some others. The effectiveness of biological preparations was compared with the control and fungicide.

A day after spraying, the leaves were selected, laid out in a humid chamber with filter paper and infected with a suspension of phytopathogenic fungi - *Alternaria alternata* (causative agent of soybean alternaria) and *Fusarium oxysporum* (causative agent of fusarium wilt). On the 5-6th day after infection, soybean leaf lesions by phytopathogens were recorded on a 7-point scale, and the development of diseases and the effectiveness of biological preparations were determined.

Results. According to the results obtained, the Sporazin formulation (*Pseudomonas aureofaciens* Mb-24 + *Pseudomonas aureofaciens* Mb-17 + *Bacillus subtilis* BT-7), applied at a rate of 3 L/ha, demonstrated the highest efficacy against both alternaria leaf spot and fusarium wilt, with efficacy levels of 92% and 88%, respec-

tively. Its effectiveness was even higher than the fungicide Zepan, KS (kresoxim methyl, 125 g/l + epoxiconazole, 125 g/l + difenoconazole, 80 g/l), 0.7 l/ha.

The preparation Fungiclin, R. (*Streptomyces netropsis*), at 0.2 L/ha, also demonstrated high efficacy, with a protective effect of 77% and 88%. The effectiveness of other drugs was at the level of 41-64%.

Conclusions. The studies showed that biological drugs in the laboratory-vegetation experiment showed a fairly high protective effect against pathogens of alternariosis and fusarium wilt of soybean. This indicates the possibility of using them to protect soybean crops from diseases.

Keywords: phytopathogens, soybean, biological drugs, disease development, effectiveness

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