

Effect of nitro groups on the fungicidal activity of benzoxazole

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Abstract

Environmental agriculture provides for a complete abandonment of stimulant chemicals or the maximum reduction in their use. This can be achieved by selecting substances, the use of which will make it possible to solve the main tasks of agro-industrial production: to obtain and maintain high yields without harm to the environment and human health. On the basis of the Department of Chemistry, studies of the fungicidal and biological activity of various classes of organic compounds are carried out. This article is devoted to one of the stages of research – the study of the fungicidal activity of compounds of the nitrobenzoxazole group.

In the experiment, benzoxazole, 5-nitrobenzoxazole, 5,7-dinitrobenzoxazole was used. The objective of the study was to analyze the effect of nitro groups on the fungicidal activity of benzoxazole.

To this end, the analytes were tested for fungicidal activity *in vitro* on six fungi-phytopathogens from different taxonomic groups, which are among the most common pathogens of agricultural plants in the Central region of Russia. For the experiment, fungi were used: *V. inaequalis* – apple scab, *R. solani* – causative agent of rhizoctonia, *F. oxysporum*, *F. moniliforme* – causative agents of fusariosis of cereal crops, *B. sorokiniana* – causative agent of root rot and *S. sclerotiorum* – causative agent of white rot.

The radial growth of the mycelium was determined according to the procedure developed by NIITEKHIM, according to which the culture of fungal cultures in nutrient media with the addition of test substances was carried out. At the same time, control was conducted in the aquatic environment. The growth of mycelium was monitored by measurements on days 3, 6 and 9. The percentage inhibition of fungal growth was calculated using the Abbott formula.

For comparison, the activity of reference preparations was studied from the list of fungicides approved for use in the Russian Federation (preparations "Maxim", "Profit Year" and "Rajek").

Analysis of the data obtained in the experiment demonstrates the highest fungicidal activity of unsubstituted benzoxazole for all types of fungal cultures used in the study. One nitro group, the introduced benzoxazole molecule, reduces fungitoxicity, and the introduction of the second nitro group enhances biological activity.

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