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THE COMBINATION OF NO DONOR AND FERULIC ACID EFFECT ON THE ELICITATION OF WHEAT TOLERANCE AGAINST BIOTIC STRESS

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Introduction. One of the alternative ways to protect agricultural plants from crop losses caused by fungal infections is the usage of biotic elicitors. Nitric oxide NO as a signal molecule plays an important role in plant responses to biotic stress. The aim is to research the ability of enhancing ferulic acid (FA) effect as a biotic elicitor to induce tolerance of wheat plants against fungal diseases by addition donor of NO signal molecule.

Methods. The content of endogenous hydrogen peroxide (HP) was measured in leaves by sulfate-titanium method. Winter wheat plants (cv. Oberig myronivskij and Svytanok myronivskij) were inoculated by *Septoria tritici* Rob et Desm. leaf blotch infection at booting phase three days after 0.1 mM solution of FA and 0.5 mM solution of sodium nitroprusside as donor NO treatment. The powdery mildew caused by *Erysiphe graminis* f.sp. *tritici* DS Em. Marchal was detected in field trials. The extent of disease development according to Saari-Prescott scale, morphometric parameters and yield structure were analyzed.

Results. It is shown that combination of treatment by FA with NO donor reduced the disease symptoms by 1-3 points, decreased the HP content

under biotic stress in wheat plants by 70%. The processes of morphogenesis were stimulated and yield increased by 15-25%.

Discussion. Hydrogen peroxide (HP) is a link in the plant protection system and is used as a stress level indicator. During the fungal and plant development, their metabolisms counteract and FA could stimulate the plant cell wall building acting as a source. That process needs HP for peroxidase enzyme. Nitric oxide also influences HP content. So tolerance to fungal diseases in wheat could be enhanced by combination with donor NO via control of HP content. The reaction of wheat plants depended on genetic characteristics of different cultivars and nutrition type of phytopathogens.

Conclusions. The data obtained suggest that combination of FA with donor NO could be used as more effective combination than biotic elicitor. They decreased the degree of lesions in leaf area caused by leaf blotch and powdery mildew infection and stimulated the increasing of yield.

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