

## Testing Of Populations Of Selected Fungal Pathogens Of Cereals For Resistance To Fungicides

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**Abstract :** Today, it is essential to ensure effective protection of cultivated cereal crops against fungal pathogens, which are one of the main factors limiting the yield and quality of cereal crops worldwide. The economic impact of losses caused by the emergence of resistant pathogen populations to fungicides is significant and it is therefore essential to seek effective strategies to protect against the establishment and emergence of resistant populations. In this study, the susceptibility analysis of fungal pathogens to different fungicidal agents was carried out. The results showed variability in the efficacy of fungicidal agents against the pathogens and suggest the need to reconsider the use of certain agents in crop protection. The efficacy of a total of five fungicidal active ingredients (fluxapyroxad, azoxystrobin, fenpicoxamid, prothioconazole, mefentrifluconazole) was tested at different concentrations on a total of 236 isolates of the pathogens *Monographella nivalis*, *Oculimacula yallundae*, *Zymoseptoria tritici* and *Ramularia collo-cygni*. The hypothesis of this work, based on the assumption of the existence of variation in the susceptibility of pathogens to fungicides, was confirmed. The aim was to determine the level of susceptibility of the selected fungal pathogen isolates of cereal crops to commonly used fungicidal agents. The fungicide with the highest proportion of individuals showing lower susceptibility ( $EC_{50} > 0.5 \mu\text{g/ml}$ ) was azoxystrobin. The  $EC_{50}$  value refers to the effective concentration of the fungicidal agent inhibiting mycelial growth by 50%. Most of the *Monographella nivalis* isolates (94.83%) showed resistance to azoxystrobin, while they did not show resistance to prothioconazole and only 6.78% of the isolates were resistant to fenpicoxamide. Isolates of the pathogen *Oculimacula yallundae* showed resistance neither to prothioconazole nor to fluxapyroxad. The pathogen *Zymoseptoria tritici* showed the highest level of variability in fungicide resistance, with isolates showing no resistance to fenpicoxamide, while 85.51% of the isolates showed resistance to azoxystrobin. The pathogen *Ramularia collo-cygni* showed the highest level of resistance to all the fungicidal active ingredients tested. Overall, the study provides important insights for optimising cereal crop protection strategies and reducing the risk of fungal pathogen resistance to fungicides. However, it is necessary to continuously monitor the occurrence of resistant isolates in pathogen populations and to investigate new control methods and adapt them to changing agricultural conditions.

**Keywords :** wheat, barley, diseases, protection, fungicides, fungicide resistance, monitoring

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