

Plant pathogen collection and biocontrol agents testing

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Plant diseases are one of the main factors of yield losses across the globe, and fungal pathogens are the most spread and persistent ones. Agrotechnical systems with intensive crop rotation, cultivation of resistant varieties and use synthetic fungicides helps to only partly control the level of crops mortality, but not to reduce the level of pathogenic contamination of agricultural soils. The increase of fight effectiveness against plant fungal pathogens is possible with the help of special microorganisms (biological control agents) that exhibit antagonistic activity to phytopathogens. However, in order to select the most effective biocontrol agents for specific areas, it is necessary to test them towards pathogens inhabiting particular soils.

The main objective of this study was creation of fungal plant pathogens collection from the agricultural soils sampled in the East of Tatarstan republic which is one of the most important agricultural regions in Russia. The soils used in the study were intended for planting sugar beet, wheat and barley. The total area investigated was about 20 000 ha. Pathogenic fungi were isolated from the rhizosphere soils sampled from each 5 ha. Using cultivation and microscopy methods, 62 different fungal strains were isolated and identified. It was found that species belonging to *Fusarium*, *Alternaria*, *Aspergillus*, *Penicillium* taxa were the most spread one. Further, ability of the two biocontrol agents that are usually used to treat the fields in Tatarstan to suppress the pathogens was checked using co-plate method on the Petri dishes. It was found that *Trichoderma asperellum* T203 suppressed 61% of fungal strains, while *Streptomyces* spp. suppressed 27% of fungal strains.

This study allowed to assess the diversity of fungal soil pathogens for a particular agricultural area situated in Tatarstan (Russia). It was demonstrated that the strategy of biological control that is currently used is not satisfying. Based on the information about the presence of pathogens in the soil, it is possible to develop a better strategy for crop protection, as well as to prevent and to reduce crop losses.