An Attempt to Protect Winter Wheat Against *Fusarium culmorum* by the Use of Rhizobacteria *Pseudomonas fluorescens* and *Bacillus mycoides*

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Received in revised form 20 May 2004

Abstract

Inoculation of wheat seeds with two strains of *Pseudomonas fluorescens* (III 107 and 1121) and two strains of *Bacillus mycoides* (JC192 and K184) isolated from winter wheat roots, as well as with one strain of *P. fluorescens* (ID 13) isolated from oat roots, reduced the negative influence of *Fusarium culmorum* on winter wheat in a 28 day pot experiment. The bacterial strains (especially III 107 and chitinolytic JC192) markedly increased the plant seedlings emergence and the plant biomass (the shoots weight up to 252%, and the roots weight up to 229%) in comparison to the experimental series with *F. culmorum* alone. Also in a microplot experiment the yield of grain and straw of winter wheat, inoculated with the bacterial strains (especially JC192 and III107) and growing in soil contaminated with *F. culmorum*, was higher (the grain yield up to 120%, and the straw yield up to 139%) than in a series with *F. culmorum* alone (100%). In both experiments the highly cyanogenic strain 1121 was least effective. A linear correlation ($r_{SP} = 0.926$) and a rank Spearman's correlation ($r_{SP} = 0.991$), both significant at $p<0.01$, between the weight of plant biomass in the pot experiment and the yield of whole shoots in the microplot experiment were found. It suggests that the same mechanisms worked in both experiments, although with different intensity.

Key words: winter wheat protection *F. culmorum*, rhizobacteria

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