

# **Microbial consortia products as biological inoculants for improved growth of maize**

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In contrast to selection of single microbial (Plant Growth-Promoting Microorganisms, PGPMs) strains with high efficiency for plant growth promotion, the use of large consortia of different PGPMs may be an alternative strategy to induce beneficial effects on plant performance, with the advantage of higher flexibility towards variability of environmental conditions due to selective promotion of the best-adapted strains, depending on the respective rhizosphere conditions. In this study, the effects of a commercial microbial consortium product (MCP) with 20 different fungal and bacterial PGPMs on early growth of maize were tested in pot experiments with different levels of N and P supply, including a functional characterization of inoculant effects on marker enzymes for N, P and C cycling in the rhizosphere. Auxin production potential of the re-isolated populations was evaluated spectrophotometrically. The application of the MCP induced a significant stimulation of shoot and root biomass production and could even compensate for reduced input of N and/or P. This was associated with increased fine root production and improved P-nutritional status, particularly in the inoculated variants with reduced nutrient input. The results suggest that the MCP-induced beneficial effects on plant growth and nutrient acquisition in maize could be mainly attributed to root growth stimulation. This rhizosphere effect of the inoculants deserves a more detailed future investigation.