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“Development on the margin”

## The Effect of *Bacillus Megatherium* Var. *Phosphoricum* and Phytosiderophores Exudates of Rye on the Phosphorus Content of the Soil

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### Abstract

Phosphorus (P) is one of the most important soil fertility factor in most tropical soils that determine the level of crop yield. The increasing demand for P fertilisers indicates that rock phosphates mined for fertiliser production will disappear in a few decades.

The availability of P for the plants is determined by several factors. Plants can modify this process by root exudates — like phytosiderophores —, and microorganisms can also take their part by secreting organic compounds. To apply bacteria (PGPB- Plant Growth Promoting Bacteria) as biofertilisers is becoming an accepted method, because the level of animal breeding and the utilisation of organic fertiliser are dropping, thus the soil is running short of useful bacteria. There are biofertilisers that contain phosphate-solubilising bacteria, like *Bacillus*, to improve the chemical P-availability in the soil.

In this study, a rhizobox experiment was set up to describe the potential combined effects of Phylazonit MC biofertiliser containing *Bacillus megatherium* var. *phosphoricum* and phytosiderophores exudates of the rye (*Secale cereale* L. legel&#337;) on the available phosphorus content of the soil.

In the light of our experimental results, the available P contents of the soils increased significantly in comparison with the control when the microorganisms and rye were jointly applied. The rye seedlings gradually improved the available P in parallel with the distance from the root neck causing the difference in the amounts of phytosiderophores.

The application of this biofertiliser with inorganic phosphate can make the utilisation of P fertilisers more effective and the crop production more successful.

**Keywords:** Biofertiliser, inorganic phosphate, phosphorus-solubilising bacteria, phytosiderophores