

## AZOSPIRILLUM ON GROWTH OF MAIZE AND WHEAT SEEDLINGS

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**Abstract:** The aim of this study is to determine the effect of different zinc and iron concentrations in culture medium on growth and development of maize and wheat seedlings in terms of their inoculation with bacteria of *Azospirillum* genus. Maize and wheat *in vitro* cultures were inoculated, respectively, by strains of *Azospirillum lipoferum* and *Azospirillum brasilense* strains. The experimental factor was the supplementation of the culture medium with zinc (25, 200 and 600 mg·kg<sup>-1</sup> of the medium) and iron (25, 200 and 600 mg·kg<sup>-1</sup> of the medium). Counts of bacteria from the *Azospirillum* genus were analysed and plant seedling growth and development as well as the content of chlorophyll in plant leaf blades were monitored.

Zinc turned out to reduce strongly numbers of bacteria of the *Azospirillum* genus. *Azospirillum brasilense* turned out to be particularly sensitive to elevated levels of this chemical element in the environment. The negative influence of increased quantities of zinc on cereal seedlings became apparent only after the application of the highest concentrations of this metal in the medium (600 mg·kg<sup>-1</sup>), while quantities which did not exceed 200 mg kg<sup>-1</sup> exerted a stimulation effect on the mass of maize and wheat seedlings.

Iron added to the culture medium in quantities which did not exceed 200 mg kg<sup>-1</sup> did not reduce numbers of bacteria of the *Azospirillum* genus; on the contrary, they stimulated their growth. However, at higher concentrations, this metal turned out to exert a strong negative impact on the chlorophyll content in leaf blades as well as on the mass of maize and wheat seedlings.

The inoculation with bacteria of the *Azospirillum* genus exerted a positive influence on the mass increase of maize and wheat seedlings and increased chlorophyll concentrations in leaf blades. At the same time, it contributed significantly to limiting or even levelling out the toxic impact of zinc and iron during the initial phases of plant growth and development.