

Mineral Phosphate Solubilizing Bacteria: A Potential For Natural Phosphate Direct Application

Imtinen SGHAIER*, Hanen CHERIF, Wafa HASSEN, Ameer CHERIF, Mohamed NEIFAR

¹University of Manouba, Higher Institute of Biotechnology, LR Biotechnology and Bio-Geo Resources Valorization LR11ES31, Biotechpole of Sidi Thabet, 2020, Tunisia

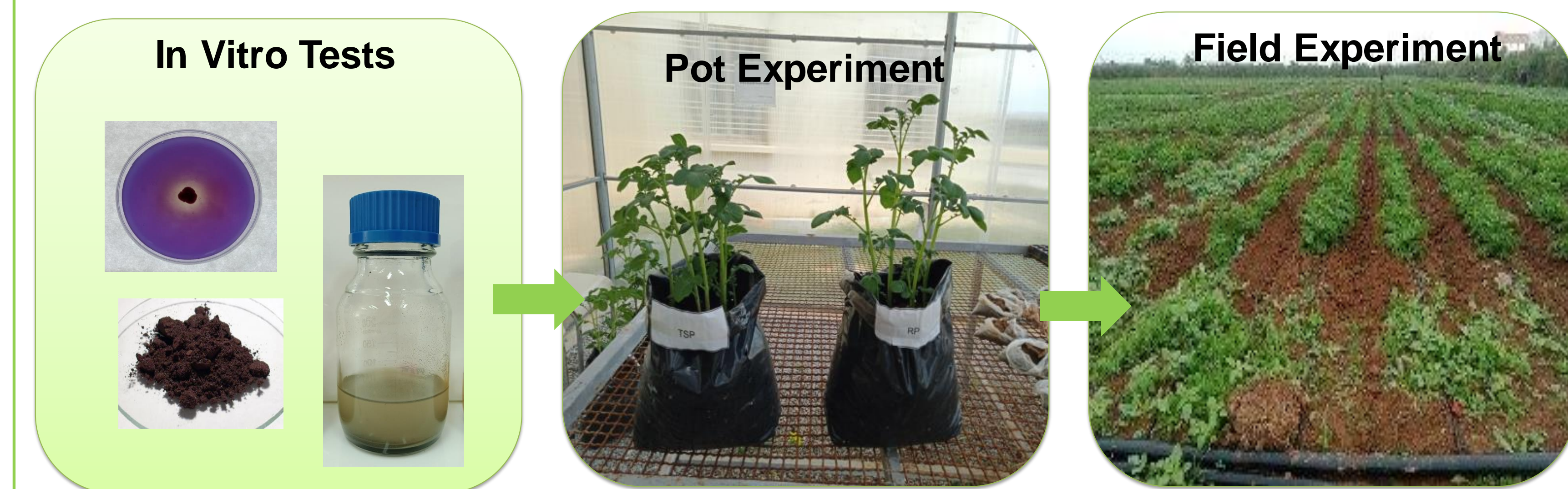
²University of Tunis El Manar, Faculty of Sciences of Tunis, Laboratory of Microorganisms and Active Biomolecules, 2092, Tunis, Tunisia

*Corresponding author: imtinensghaier91@gmail.com

Abstract

Despite being exploited for centuries, the direct application of natural phosphate in agriculture remains inadequate. Thus, there are some restrictions which limited its direct application such as the efficiency in only acid soils and the presence of impurities like metals and radionuclides. Chemical conventional treatment has entailed significant damage to environment, soil quality and public health. Biological approach has emerged as a great potential for sustainable manufacturing. Mineral Phosphate Solubilizing Bacteria could be an eco-friendly solution to natural phosphate direct application efficiency.

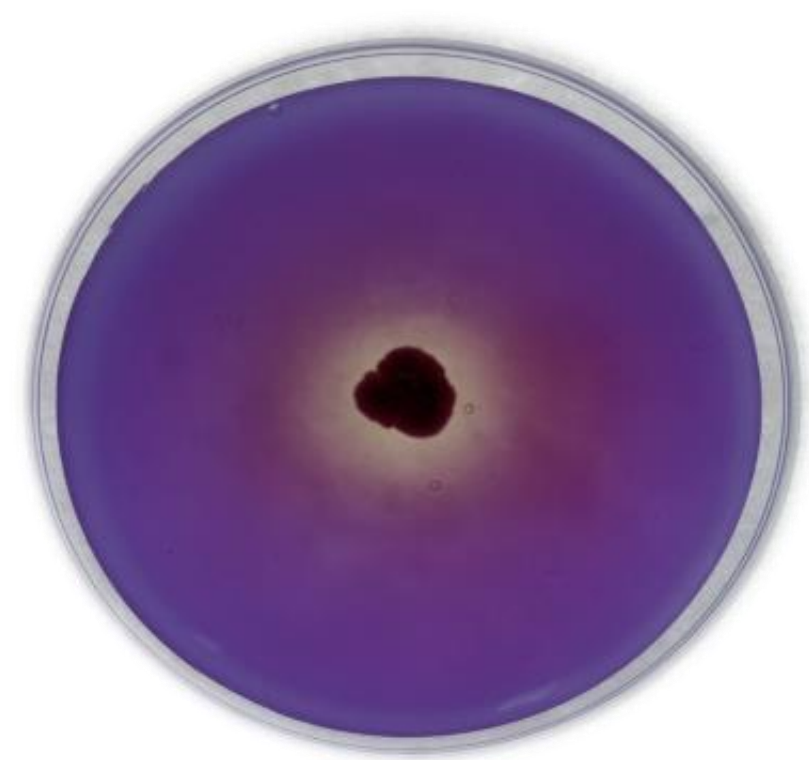
Methodology



Results

In Vitro

P solubilization



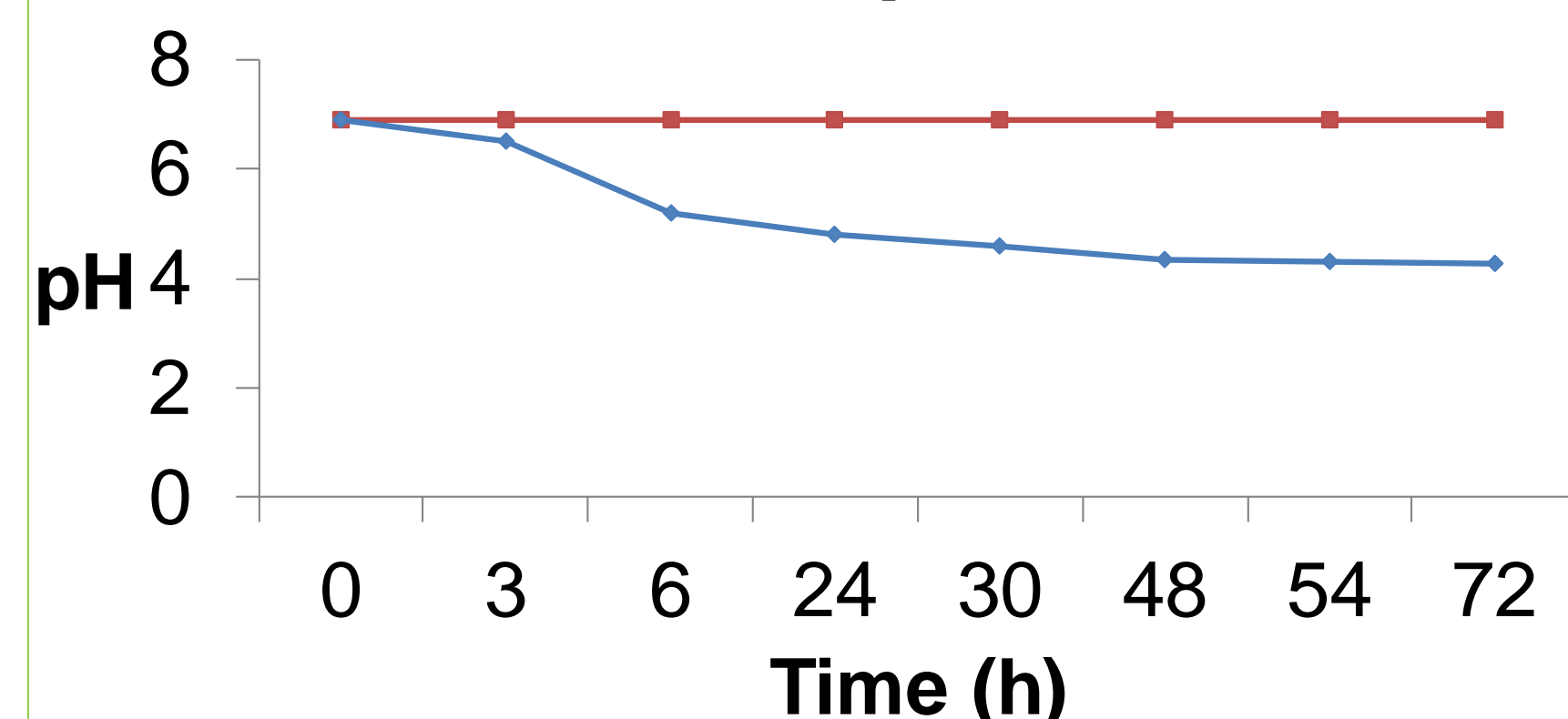
Solubilization Index=1cm in NBRIP medium+Bromophenol Blue

organic acid production

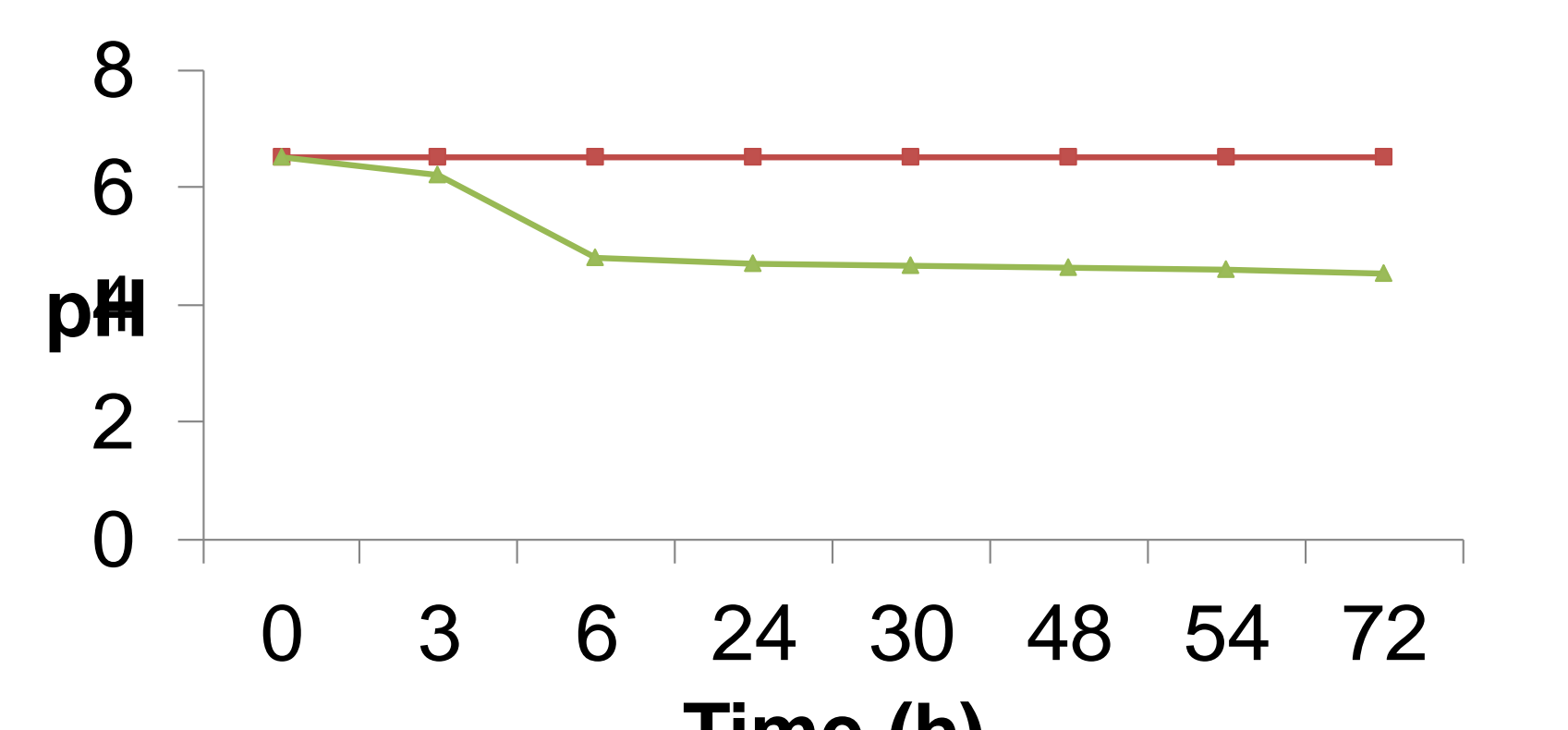


Yellow zone in NBRIP medium+Bromocresol Purple

pH lowering with Tri-Calcium Phosphate TCP

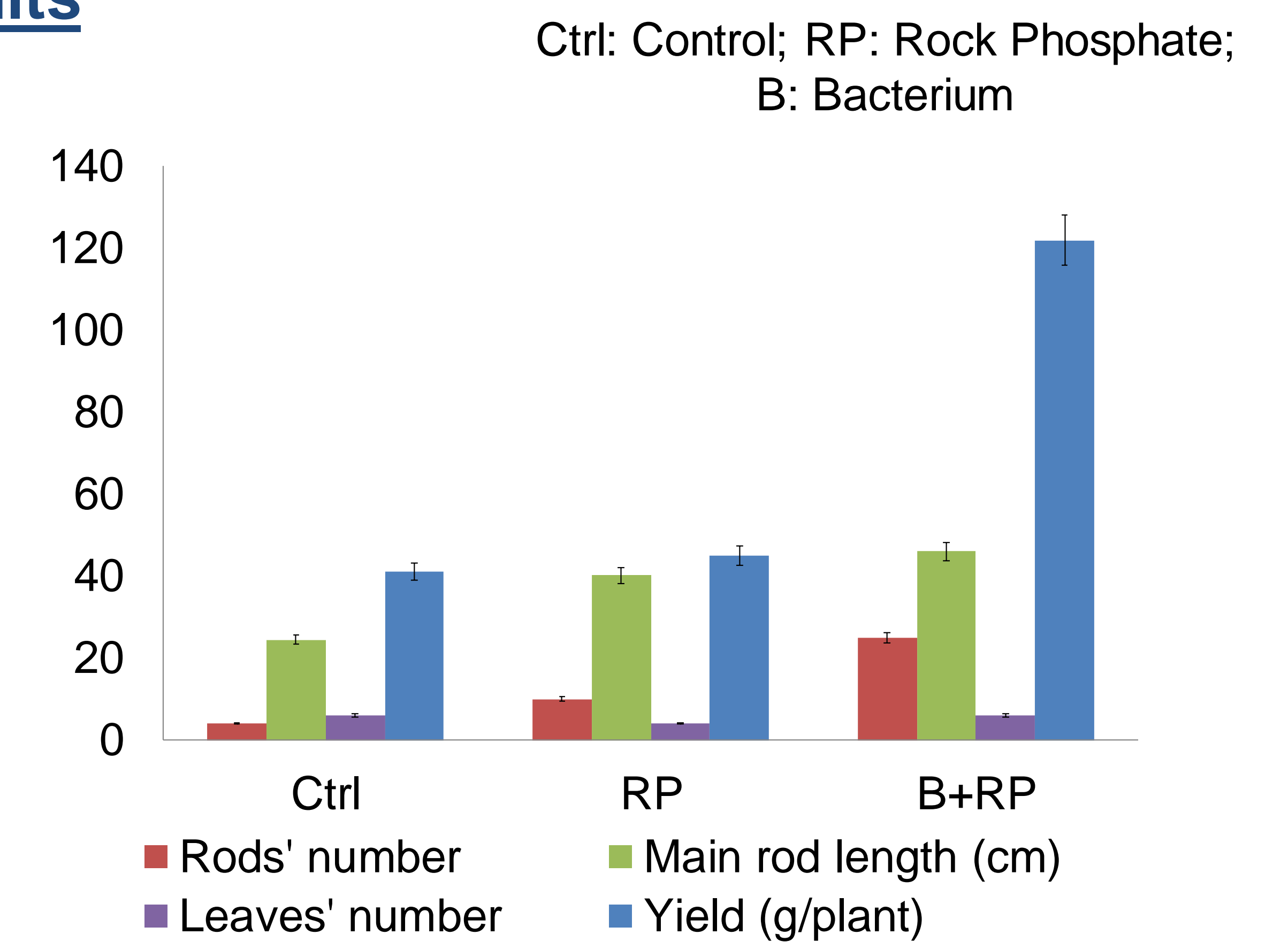
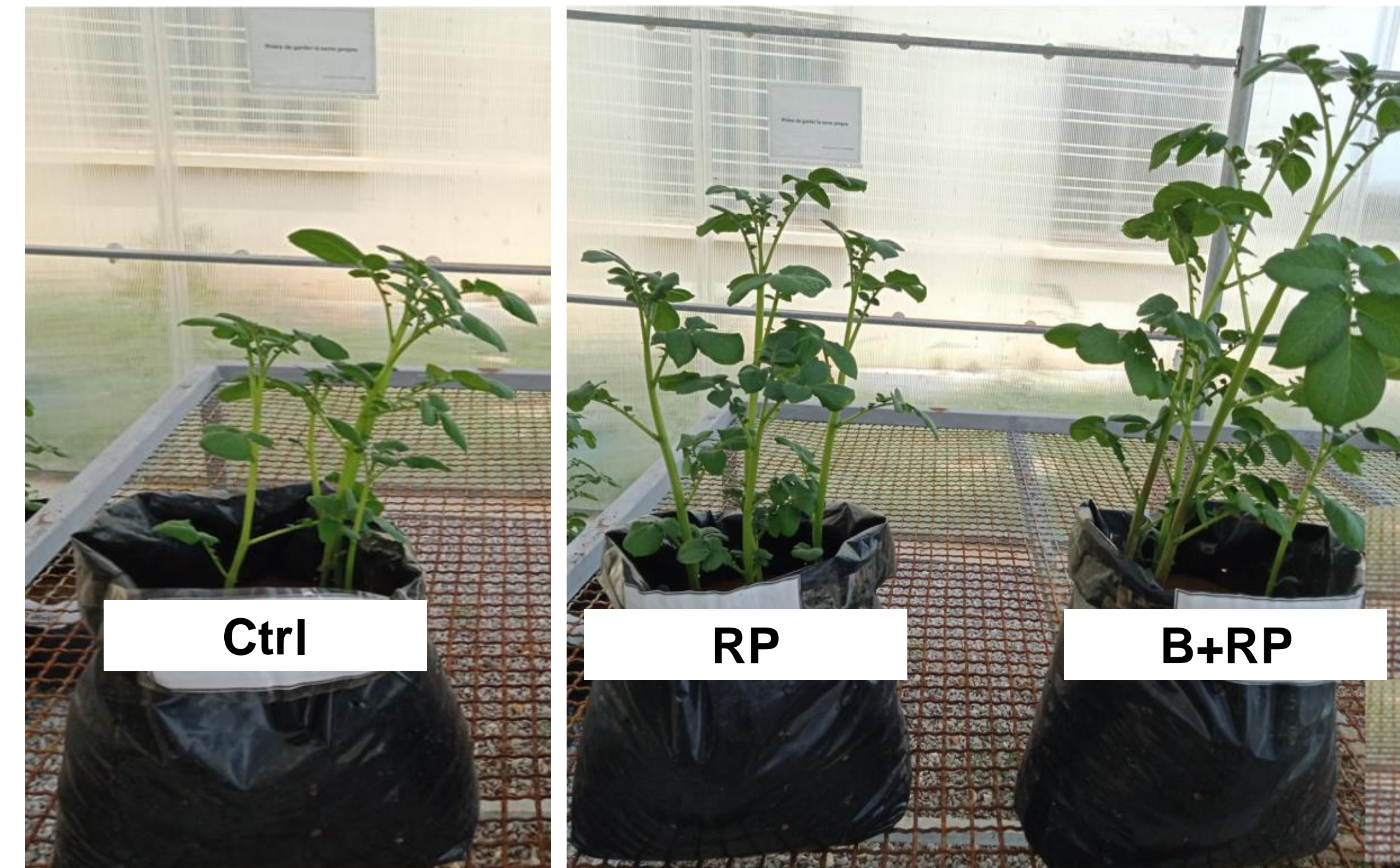


pH lowering with Rock Phosphate RP

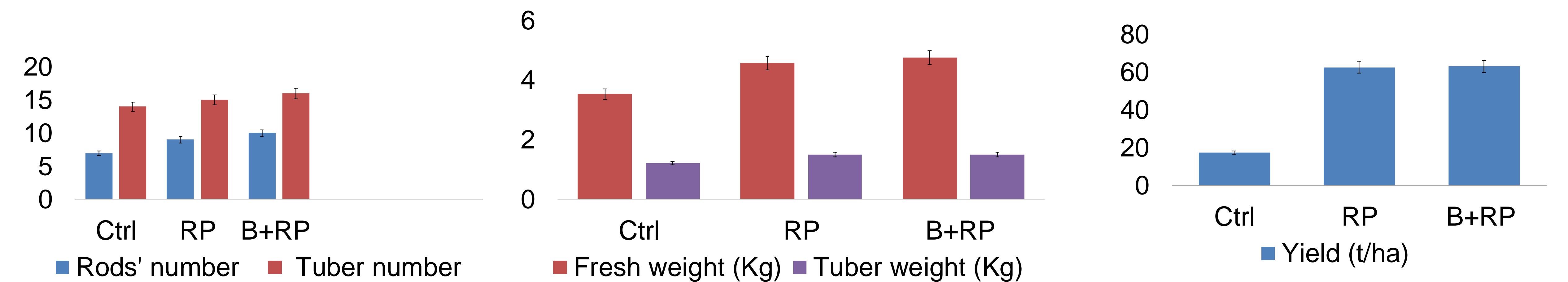


Results

Under Greenhouse



In Field



Conclusion

The strain *Pseudomonas rhizophila* S211 was shown a great potential on natural phosphate direct application efficiency by lowering soil pH and promoting potato culture.

Reference

Hassen, W., Neifar, M., Cherif, H. (2018). *Frontiers in Microbiology*, 9:34. doi: 10.3389/fmicb.2018.00034.