Innovative Solutions for Phosphorus Deficiency: The Impact of Bacterial Consortia on Crop Yield and agriculture Sustainability

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Phosphate-solubilizing bacteria (PSB) are renowned for enhancing phosphorus availability and crop yield, offering a sustainable solution amidst the challenges posed by climate change and varying environmental conditions. Comprehensive understanding of crop responses to PSB inoculation under contrasting abiotic and biotic constraints is essential, especially when using bacterial consortia that ensure complementary functions for improved plant growth and nutrient acquisition. Our approach focuses on selecting and constructing bacterial consortia to alleviate phosphorus deficiency and sustain agricultural productivity under diverse environmental stresses.

The combined application of carefully designed PSB consortia and rock phosphate (RP) can significantly enhance grain yield, nutrient uptake, and physiological performance of crops. These consortia promote increased biomass of shoots and roots, improving overall plant health and productivity. Additionally, nutrient content in crops can be markedly increased, contributing to higher grain yields and better-quality produce. This enhancement is linked to the consortia's capacity to increase rhizosphere available phosphorus through induced acid phosphatase activity and improved root growth traits. By focusing on the selection and construction of effective bacterial consortia, our approach offers a promising avenue for addressing phosphorus deficiency and improving the resilience of agricultural systems in the face of global environmental challenges.

Biography

El Haissoufi Wissal, she got her Ph.D in plant-microorganisms interaction at the Mohammed VI polytechnic and Cadi Ayad Universities. Holder of a master's degree in management and development of phytoressources at Cadi Ayad University. She is currently working with AGBS department on improving rock phosphate efficiency for a better plants phosphorus uptake. Her research interests are directed towards analysis of root functional traits in response to microbial inoculation as natural resources in order to enhance P acquisition efficiency from rock phosphate.