



Advanced Microbial Techniques in Agriculture, Environment, and Health Management

Developments in Applied Microbiology and Biotechnology

2023, Pages 21-55

Chapter 2 - Strategies and implications of plant growth promoting rhizobacteria in sustainable agriculture

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<https://doi.org/10.1016/B978-0-323-91643-1.00013-2>

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Abstract

Agriculture is a major contributor to the economy of developing countries. Population growth coupled with anthropogenic factors are exerting pressure on agriculture. The application of chemical fertilizers is the most effective way of increasing food productivity in limited land resources. Considering the negative effect of chemical use, researchers are seeking alternatives such as plant-beneficial microorganisms to boost plant growth and yield. Microbes provide plants with essential nutrients or help them to cope with stress conditions. However, an intricate network of signaling cascades and a molecular mechanism exists behind the process of improving plant health in a sustainable manner. Optimization of research on the potentiality of plant growth promoting rhizobacteria is needed to get the best performances of food production under different conditions. Inoculation of beneficial microbes is valuable and proficient in promoting growth, enhancing crop yield, and defense and stress tolerance in a sustainable manner. The use of beneficial microbes should be promoted to establish an economically viable, socially just, and eco-friendly agroecosystem.

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Keywords

PGPR; fertilizer; sustainable agriculture; soil health; molecular mechanisms

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