

## Phosphorus solubilizing bacteria and cotton yield.

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### Abstract

Plant nutrition is crucial for developmental stages and yield. Several macro and micronutrients are present in various layers of soils, but most of the micro and micronutrients are not available to roots. Amongst them, phosphorus (P) is utmost importance because it is a source of energy which is provided in the form of adenosine triphosphate (ATP). P intake is essential for the development of cotton like other crops. Besides, the fundamental genetic component that controls the plant development is phosphate. P aids in the formation of root architecture, and its lack might restrict plant growth and fibre development. While, P based fertilizers are more expensive due to its important role mentioned above. P is naturally present in the soil, but it is available if pH of soil is between 6.5-7 pH in the form of hydrogen phosphate and di-hydrogen phosphate. While, P is not available if pH goes high *i.e.* >7. There are several strategies to make them available, but Phosphorus Solubilizing Bacteria (PSB) is receiving more attention these days. It functions as a bio fertilizer and aids in improving P uptake by plant roots. Basically, PSB transforms mineralized phosphate into soluble organic phosphorus by plant roots. These bacterial colonies work directly or indirectly to increase the availability of P and operate under the symbiotic principle. P solubilizers are several species of the genera *Pseudomonas*, *Rhizobium*, *Bacillus*, and *Penicillium*. PSB implements three different strategies. Enzymes are released first, followed by P, and then organic acids, which hydrolyze minerals, and finally released into the soil. PSP has an essential role in cotton by increasing seed cotton output, chlorophyll content, and seedling growth, according to multiple research studies. It also promoted flowering and then boll development. Application of these bio stimulants also increased transpiration rate. So these microorganisms constitute a necessity for the future.

