

Application of Plant Growth-Promoting Rizobacteria to Improve Crop Growth in Saline Soil

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Abstract—Soil salinity affects vast areas of Haryana's farming land and the area of salt affected land is increasing rapidly. Plants absorb essential nutrients in the form of soluble salts, but excessive accumulation strongly suppresses the plant growth. Several biochemical processes can be affected by salinity, including protein synthesis, photo-synthesis and lipid metabolism. Many strategies have been developed in order to decrease the toxic effects caused by high salinity on plant growth. However, such strategies being long drawn and cost intensive, there is a need to develop simple and low cost biological methods for salinity stress management, which can be used on short term basis. Plant Growth-Promoting Rizobacteria that live in close association with the plant roots play a significant role in stress alleviation in crops grown in saline soils due to their unique properties of tolerance to extremities, their interaction with crop plants and stimulating plant growth by a variety of mechanism. They promote growth directly or indirectly by secreting various chemicals in the vicinity of the root directly by manipulating plant hormone levels reinforcement of chemicals (phosphorus, nitrogen, etc) mechanism of phytohormones production, ACC deaminase and osmolites have major role in promoting growth of many crops. Instead of promoting growth PGPR also helps towards bioremediating potentials by detoxifying heavy metals, pesticides it also controls phytopathogens as biopesticides Use of these microorganisms in stressed soils can alleviate stresses in crop plants, thus opening a potential and promising strategy in sustainable agriculture.

Keywords: Soil-salinity, Plant growth-promoting rizobacteria. Phytopathogens, phytohormones.