

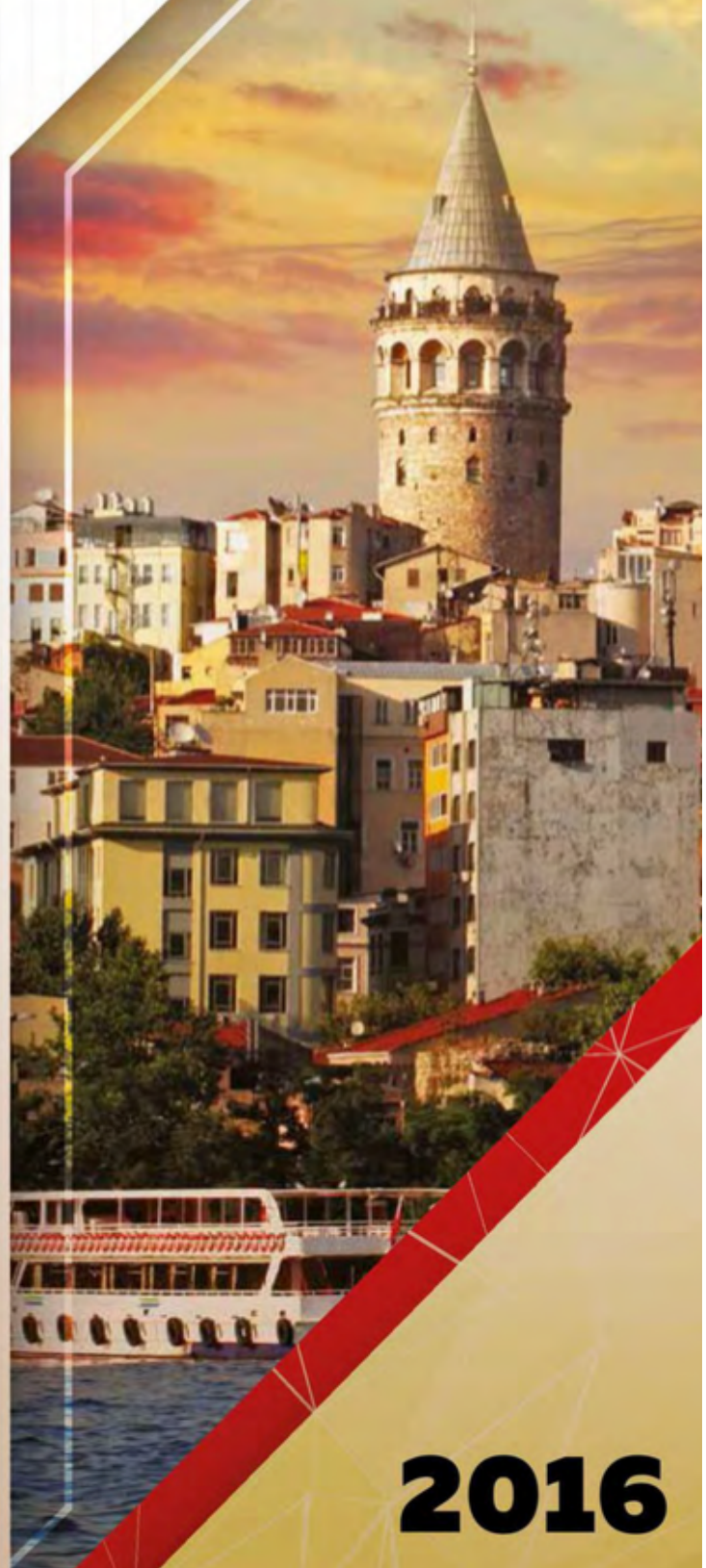


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# **ABSTRACT BOOK**

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## Plant Growth Promoting Rhizobacteria as Alleviators for Soil Degradation

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The long-term development of global socio-economic systems requires the sustainable use of natural resources. The sustainable use of soil resources depends on three factors: soil characteristics, environmental conditions and land use. The latter comprises important concerns related to eutrophication of surface water, contamination of groundwater, and emissions of trace gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, and NO<sub>x</sub>) from terrestrial/aquatic ecosystems to the atmosphere. Soil structure is the important property that affects all three degradation processes. Thus, land degradation is a biophysical process driven by socioeconomic and political causes. Farmland degradation can also have important negative effects of the farm, including deposition of eroded soil in streams or behind dams, contamination of drinking water by agrochemicals, and loss of habitat. Existing estimates of the current global extent and severity of the problem should be considered indicative at best. The Global Land Assessment of Degradation, based only on the impressions of experts, estimates that nearly two billion ha worldwide (22% of all cropland, pasture, forest, and woodland) have been degraded since mid-century.

Around 3.5% of the two billion totals are estimated to have been degraded so severely that the degradation is reversible only through costly engineering measures, if at all. Just over 10% has been moderately degraded, and this degradation is reversible only through major on-farm investments. Of the nearly 1.5 billion ha in cropland worldwide, about 38% is degraded to some degree. Various sources suggest that 5–10 million ha are being lost annually due to severe land degradation. If this trend continues, 1.4–2.8% of total cropland, pasture, and forest land will be lost by 2020. Declining yields (or increasing input requirements to maintain yields) could be expected over a much larger area. These data are, however, likely to overestimate the problem, as they don't account for the effects of land improvements, which also appear to be widespread.

**Keywords:** Plant Growth Promoting Rhizobacteria, Soil degradation, Sustainable agriculture, organic agriculture