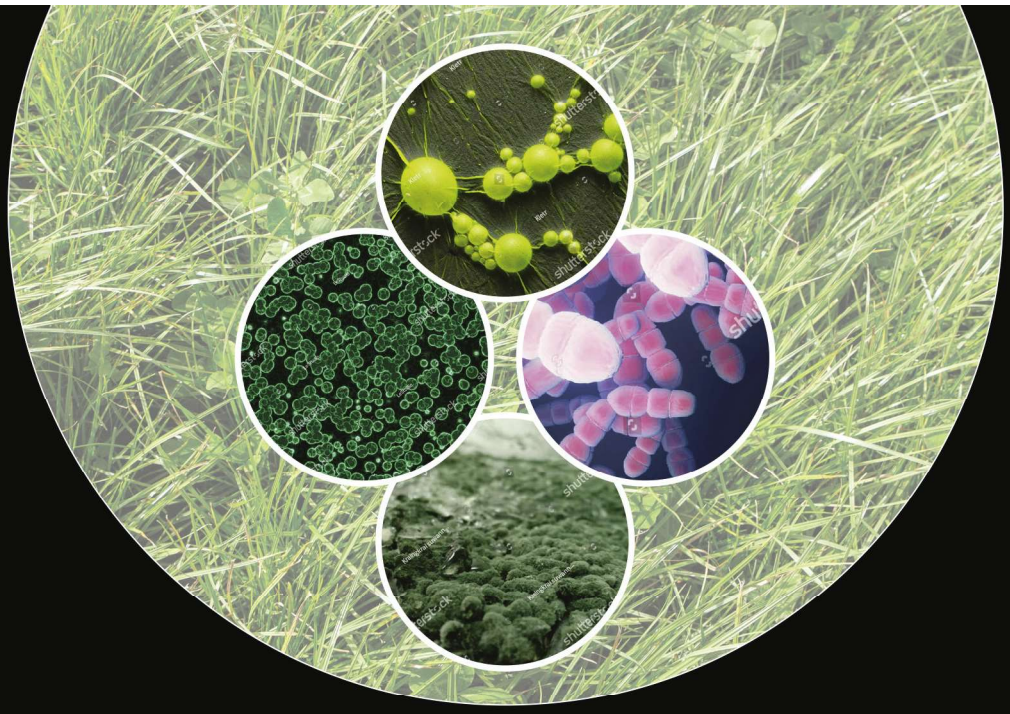

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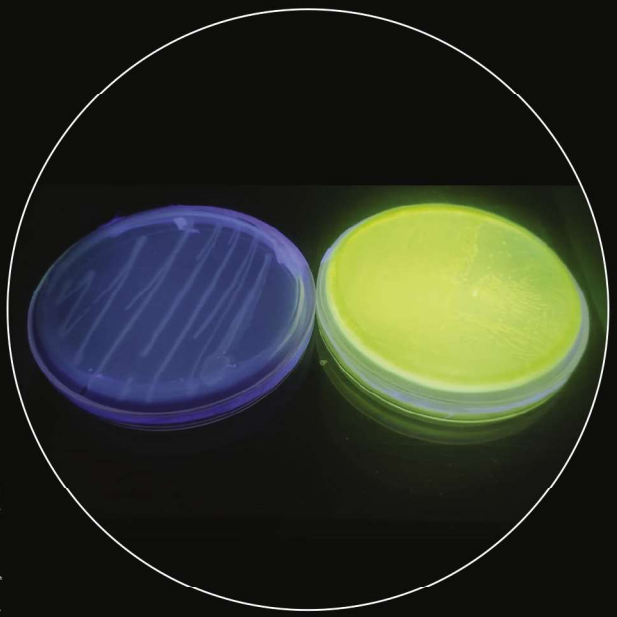
Sustainable Agriculture: Microorganisms as Biostimulants



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Contents

CHAPTER

5

Micro and macroalgae: A potential biostimulant for abiotic stress management and crop production

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5.1 Introduction

Increase in global demand for crop production insists on the need for finding sustainable technique to meet the ever-growing nutritional requirement as well as to overcome the stress induced by the agrochemicals. Moreover, resistance of the pests to commercially available agrochemicals like fungicides and herbicides made them ineffective and necessitates the importance of finding alternate strategy for protecting plants (Russell, 2005). Being environmentally, ecologically safe and non-toxic in nature, organic biostimulants and biofertilizers including algal biostimulants are highly preferred for agriculture and plant management programme.

Global demand for food, utilization of crops for biofuel extraction has also increased the cost of chemical fertilizers drastically (FAO 2011). The usage of chemical fertilizers can be reduced by applying suitable organic biostimulant with plant-growth stimulating potential. Microalgae are attracting the interest of agrochemical industries and farmers, due to their biostimulant and biofertiliser properties. These algae-based biostimulants can also serve as an alternate to overcome the impact of climatic change on crop production and to increase agricultural sustainability (Elarroussia et al., 2016).

Microalgae are endowed with enormous amount of micro and macronutrients which are necessary for the plant growth. It can serve as an efficient biostimulant that improve soil properties, fertility, thereby enhancing nutrient uptake, abiotic stress tolerance, crop growth, productivity, quality and shelf life of the plant products (Rouphael and Colla, 2018). Moreover, they are considered to be cost-effective and eco-friendly alternate to agrochemicals and plant growth regulators (Kawalekar, 2013). These microalgae might be useful to improve agricultural sustainability as they enhance crop productivity with negligible impact on the

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