



Research Article

## Response of cotton based cropping systems and nutrient management practices with bioinoculants on growth and yield of cotton in South India

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**Abstract :** A cropping system is to be efficient in resource use and ensure sustained production with no adverse effect on the bioecosystem. Nutrient management is considered to be an important technology for increasing the productivity of the crop plants. Application of nitrogen at the time of flowering leads to increase in seed cotton yield and quality in most of the crops. Phosphorus and potassium favour root growth, square, fruiting and seed development in cotton. Application of bioinoculants leads to induce the plant growth hormone and increased production of growth promoting substances, improved ACC deaminase activity (1-amino cyclo propane-1-carboxylate), siderophore production, phosphorus solubilization, indole acetic acid production and biological N fixation. A study was conducted with an objective to study the growth and yield of cotton under sole as well as intercropping systems with levels of NPK and bioinoculants. Field experiments were conducted in winter seasons during 2007 and 2008 on MCU 12 cotton at Tamil Nadu Agricultural University, Coimbatore, South India. The results proved that cotton + *dhaincha* recorded the highest seed cotton yield of 2010 and 1894 kg ha<sup>-1</sup> with combined application of 100 per cent recommended NPK and bioinoculants recorded the seed cotton yield of 2227 and 1983 kg ha<sup>-1</sup>, respectively during 2007 and 2008, respectively.

**Key Words :** *Gossypium hirsutum* (L.) Intercropping, Mineral nutrition, Bioinoculants, Seed cotton yield

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### INTRODUCTION

Cotton (*Gossypium* sp.) is one of the most important commercial crops playing a key role in global agriculture. In south India, the crop is mostly cultivated during winter and there exists a wide gap between the potential yield and actual yield and this yield gap has to be narrowed down. Today, greater emphasis in cotton cultivation has been on the cost-cutting and low energy intensive farming with very low biotic pressure to harvest the better produce since improved crop

management especially its nutrition has a key role on both yield and quality (Rajendran *et al.*, 2011). The deterioration of the soil quality pertinent in the traditional cotton belt due to poor resource management. Similarly, imbalanced fertilization, soil erosion and exclusion of organic sources coupled with overuse of acid forming N fertilizers especially urea compels the cropping systems to exploit soils reserves for other nutrients, thereby creating multiple nutrient deficiencies. Therefore, there is an urgent need for appropriate crop nutrition, a key component for yield maximization and better quality, through integrated nutrient management (Praharaj *et al.*, 2006). However, the suitable intercrops and integrated use of organics and inorganic can restore and sustain soil fertility and productivity. The present study was undertaken with the objectives of economizing the use of mineral fertilizers through suitable intercropping and integrated nutrient management to formulate a sustainable production technology by integrating organic, inorganic and biological sources of nutrients for

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