



Research Article

Nutrient uptake and its availability as influenced by plant geometry in Bt cotton

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Summary

A field investigation was conducted during *Kharif* season of 2009-10 . The experiment was laid out in split plot design with three replications. There were twelve treatment combinations comprising three plant geometries viz., 90 cm x 60 cm, 120 cm x 45 cm and 180 cm x 30 cm and four nutrient levels viz., 80:40:40, 100:50:50, 120:60:60 kg NPK/ha and 75 % RDF + 5 t FYM/ha. The plant geometries were allotted to main plot and nutrient levels were accommodated in sub plots. The plant geometry of 90 cm x 60 cm has recorded significantly higher number of sympodias per plant, the number of picked bolls per plant and seed cotton yield per plant over 120 cm x 45 cm and 180 cm x 30 cm. The seed cotton yield per hectare was also higher in plant geometry of 90 cm x 60 cm than 120 cm x 45 cm and 180 cm x 30 cm. The application of nutrient level *i.e.* 120:60:60 kg NPK/ha was found superior for enhancing growth parameters viz., plant height, number of leaves, leaf area and dry matter. The application of 75% RDF + 5 t FYM/ha was recorded significantly higher seed cotton yield per hectare.

Key words : Nutrient uptake, Availability of NPK, Yield

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Introduction

Cotton (*Gossypium* spp.) is one of the important cash crop of India, which is sub-tropical crop grown in an area with rainfall of 600 mm to 2500 mm. It tolerates high temperature upto 45°C to 46°C but temperature below 25°C is not conducive to this crop, temperature between 27°C to 32°C is optimum for boll development and maturation but above 38°C yield is reduced. Its length of growing period varies from 150 to 240 days depending upon the genotype, soil and prevailing environment. Cotton grown on wide range of soils but medium and heavy textured soils are preferred for cultivation of cotton crop. Cotton needs about 700 to 1300 mm water to meet its evaporative demand.

Resources and Research Methods

The topography of experimental field was fairly uniform, leveled and had a good drainage. The soil samples from 0-30 cm soil strata were taken at random all over the experimental

area after layout but before the application of fertilizers. A composite soil sample of about 1 kg from gross samples prepared and analyzed for various physico-chemical properties. The relevant data are presented in Table A.

Data presented in Table A showed that the soil of experimental plot was clayey in texture, low in available nitrogen, low in available phosphorus and very high in available potash. The soil is slightly alkaline in reaction.

The experiment was laid out in a Split Plot Design with three replications. There were twelve treatment combinations. The combination of three plant geometries were included in the main plots and four nutrient levels in sub plots. The gross plot size was 7.2 m x 5.4 m whereas, net plot size was 5.4 m x 4.5 m.

Yield (kg/ha) :

The bolls picked from each net plot were weighed and recorded at each picking after addition of seed cotton of respective five observational plants and converted into kg/ha.