Response of Graded Levels of NPK Fertilizers to Yield Attributes and Yield of Bt Cotton in Alfisol in Southern India

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Introduction

• Cotton, the also known as ‘white gold’ and ‘king of fibre crops’, is an industrial commodity of global importance.

• Balanced use of plant nutrients corrects nutrients deficiency, improves soil fertility, increases nutrient and water use efficiency, enhances crop yields and farmer’s income, and crop quality and the environment.

• Cotton farmers in India mainly apply nitrogen (N) and phosphorus (P) fertilizers but application of potassium (K), sulphur (S) and micronutrients is limited.

• At present there is no recommended NPK fertilizer dose for Bt cotton grown in Alfisols in Karnataka. The dose recommended for Bt cotton grown in Vertisols is being used for Alfisols which is 100:50:50.

• Keeping all these in view a field study was conducted at farmers’ fields to determine the optimum NPK fertilizer dose for Bt cotton in Alfisols in North Karnataka, India.

Methodology

• Field trials location: Dharwad, North Karnataka

• Period: 2012-13 (Jodali village, Kalgatagi taluk), 2013-14 (Pale village, Hubballi taluk)

• Spacing: 90 cm X 60 cm, Variety: MRC – 7351 (Kanaka)

Fertilizer doses

Absolute control (no fertilizer application)

N levels: N1 – 100 kg ha⁻¹, N2 – 125 kg ha⁻¹, N3 – 150 kg ha⁻¹

P2O5 levels: P1 – 50 kg ha⁻¹, P2 – 75 kg ha⁻¹

K2O levels: K1 – 50 kg ha⁻¹, K2 – 75 kg ha⁻¹, K3 – 100 kg ha⁻¹

• The soil of the experimental sites was sandy loam in texture with an acidic pH 6.27 and 5.72, and was non-saline.

• The fertility status of the soil was low and medium in the available N, P2O5, and K2O.

Results

• Significantly higher seed cotton yield and yield attributing characters viz., number of sympodial branches (22.8), good opened bolls (40.7 plant⁻¹), total number of bolls (42.7), mean boll weight (5.7 g), and seed cotton yield (2,283 kg ha⁻¹) were recorded in treatment N3P1K2 (150:50:75 kg N:P2O5:K2O ha⁻¹).

• The lowest number of sympodial branches (19), good opened bolls (26.5 plant⁻¹), total number of bolls (31), mean boll weight (4.4 g) and seed cotton yield (1,734 kg ha⁻¹) were registered in treatment N1P1K1 (100:50:50 kg N:P2O5:K2O ha⁻¹).

Conclusions

NPK dose of 150:50:75 kg N:P2O5:K2O ha⁻¹ was found to be the optimum for improving yield attributes and yield of Bt cotton, and increasing incomes for farmers who grow in Alfisols.

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