

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

Jyothi, T.V.¹, Hebsur, N.S.¹, Bansal, S.K. ² and Sokolowski, E.³
¹Department of Soil Science and Agricultural Chemistry, UAS, Dharwad, India; ²Potash Research Institute of India, Gurgaon, Haryana, India (surinkumar@yahoo.co.in); ³International Potash Institute (IPI), Zug, Switzerland; IPI Coordinator for India (Eldad.Sokolowski@icl-group.com)

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 (Jodalli village, Kalghatgi 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

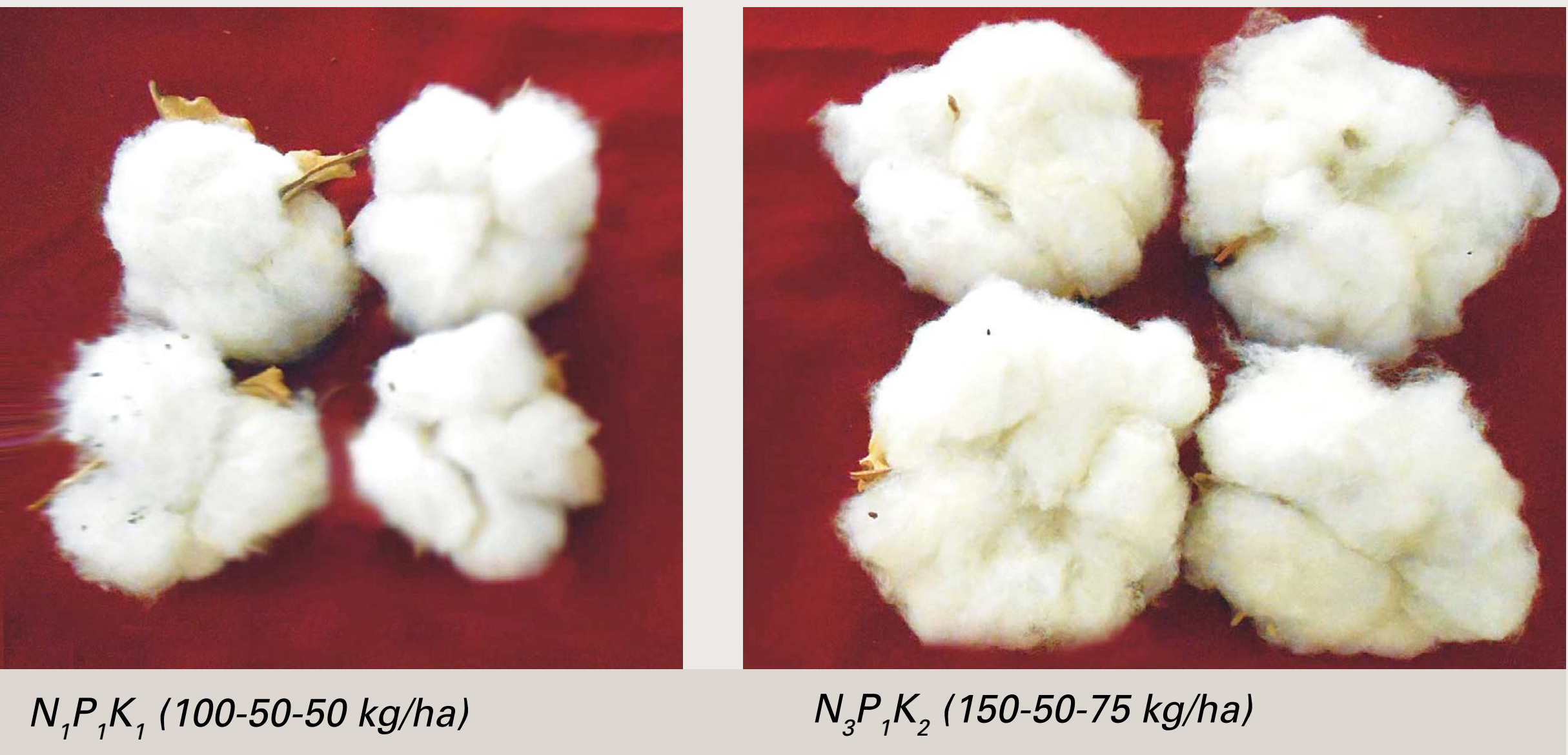
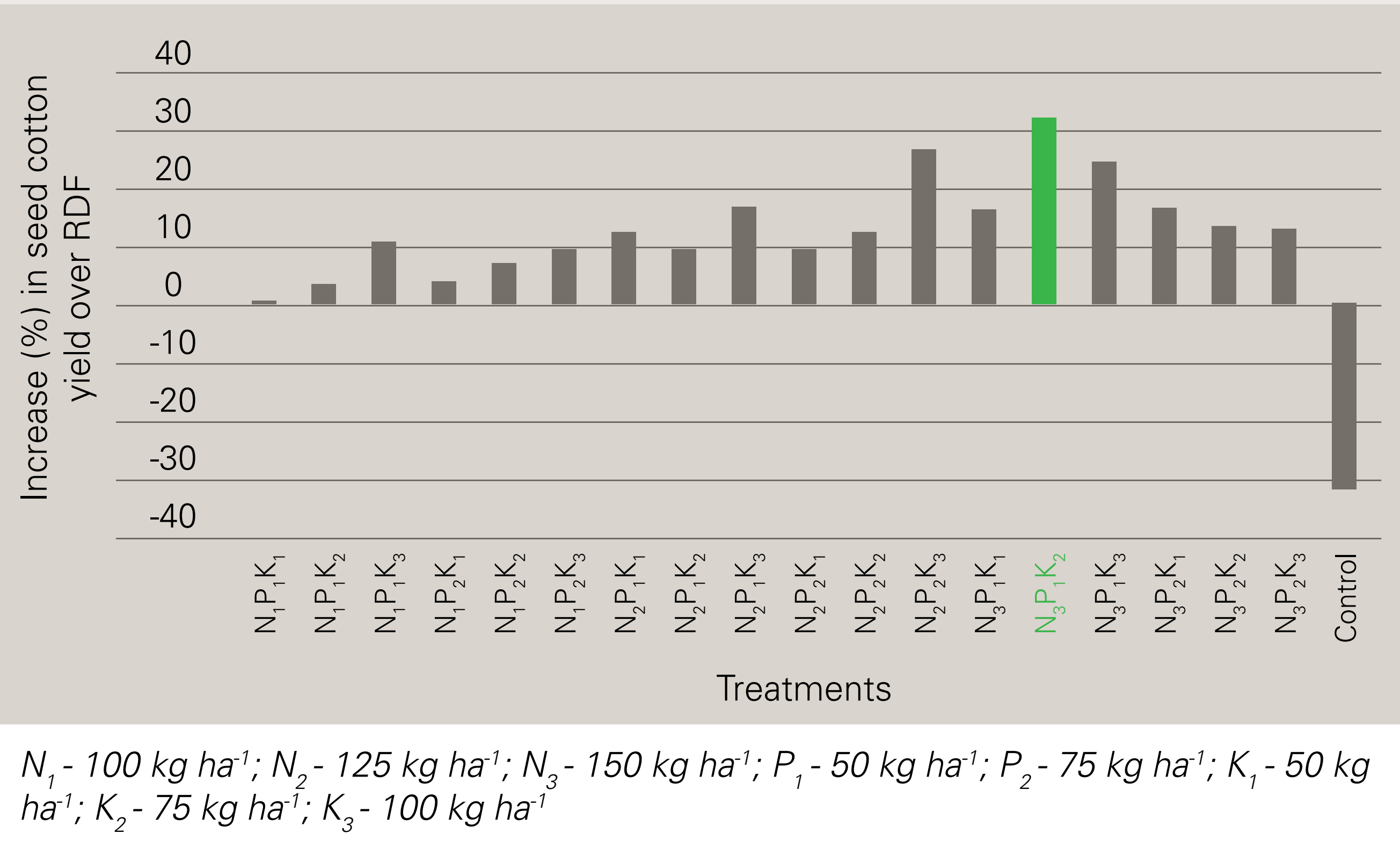
- Significantly higher seed cotton yield and yield attributing characters viz., number of sympodial branches (22.8), good opened bolls (40.7 plant⁻¹), total number of bolls (42.7), mean boll weight (5.7 g), and seed cotton yield (2,283 kg ha⁻¹) were recorded in treatment N₃P₁K₂ (150:50:75 kg N:P₂O₅:K₂O ha⁻¹).
- The lowest number of sympodial branches (19), good opened bolls (28.5 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.

Acknowledgements: IPI is gratefully thanked for the financial support and UAS, Dharwad authorities are also thanked for the kind support and facilities.

Increase (%) in seed cotton yield of Bt cotton over the recommended dose of fertilizer (100:50:50 N₁P₁K₁) as influenced by different levels of NPK (mean of two years)



Effect of K on yield attributes of cotton (mean of two years)

Treatments	Number of sympodial branches (at harvest)	Number of good opened bolls plant ⁻¹	Number of bad opened bolls plant ⁻¹	Total number of bolls plant ⁻¹
K ₁ - 50 kg K ₂ O ha ⁻¹	20.14	32.31	2.28	34.60
K ₂ - 75 kg K ₂ O ha ⁻¹	20.64	33.59	2.18	35.78
K ₃ - 100 kg K ₂ O ha ⁻¹	20.99	34.52	2.11	36.64
CD at 5%	00.60	01.07	0.053	01.00

Effect of NPK on yield attributes of cotton

