

Research
Paper

Nutrient requirement of Bt cotton by conjoint use of organic and inorganic fertilizers based on targeted yield approach on vertisols

S.V. DESHMUKH, U.S. KUDTARKAR AND J.R. KADAM

See end of the article for authors' affiliations

Correspondence to :

U.S. KUDTARKAR
Regional Sugarcane and
Jaggery Research Station,
KOLHAPUR (M.S.) INDIA

ABSTRACT

Nutrient requirement of Bt cotton by conjoint use of organic and inorganic fertilizers based on targeted yield approach on vertisols was conducted with Bt cotton (NCS-207, Mallica) at Rahuri during 2007-08. Fertilizer adjustment equations under (STCRC) system were formulated for Bt cotton following Ramamoorthy's inductive-cum-targeted yield model. The nutrient requirement for production of one quintal of Bt cotton was found to be 5.84, 2.02 and 3.51 kg of N, P₂O₅ and K₂O, respectively. The per cent contribution soil and fertilizer nutrients were found to be 45.87 and 37.77 for N, 83.63 and 31.90 for P₂O₅ and 17.68 and 27.99 for K₂O, respectively. Likewise, the per cent contribution from farmyard manure (FYM) was 40.17, 37.38 and 31.47 kg ha⁻¹ of N, P₂O₅ and K₂O, respectively. The quantity of FYM that could be adjusted to the levels of farmyard manure was evaluated to be 0, 10 and 20 t ha⁻¹, respectively for fertilizer with FYM.

Deshmukh, S.V., Kudtarkar, U.S. and Kadam, J.R. (2010). Nutrient requirement of Bt cotton by conjoint use of organic and inorganic fertilizers based on targeted yield approach on vertisols, *Adv. Res. J. Crop Improv.*, 1 (2) : 130-133.

Key words : Bt-cotton, Fertilizer adjustment equations, STCRC, Vertisols

INTRODUCTION

The present levels of fertilizer production in India are not enough to meet the total plant nutrient requirement in order to feed growing population of the country. The continuous unjudicious use of chemical fertilizers adversely affects the sustainability of agriculture production and causing environmental pollution. Because of imbalanced and inadequate fertilizer use coupled with low efficiency of other inputs response ratio to added nutrients has declined under intensive agriculture.

Bt cotton is one of the important commercial cash crops grown in India and has the largest average (95.30 lakh hectares) under cotton at global level and has the productivity of 553 kg lint ha⁻¹ and ranks second in production (310 lakh bales) after China during 2007-08. The productivity is still below the world average (642 kg ha⁻¹). The Maharashtra state is having the largest cotton growing area of 31.91 lakh ha and production of 60 lakh bales with productivity of 320 kg lint ha⁻¹ (Anonymous, 2009).

The fertilizer application practices indicated the possibility of enhancing production potentials of Bt cotton.

It will be always better than the soil fertility and crop requirement should be based on fertilizing the crops. Such studies are possible only through inductive-cum-targeted yield approach (Ramamoorthy *et al.* 1967) which provides a scientific basis for balanced fertilization not only among the fertilizer nutrients but also with soil available nutrients (Subba Rao and Srivastava, 1999). The Bt cotton is widely cultivated in Maharashtra and so far STCRC studies have not been conducted. Hence, the present study was undertaken to develop a balanced fertilizer by conjoint use of organic and inorganic fertilizers based on targeted yield approach on vertisols.

MATERIALS AND METHODS

A field experiment based on inductive-methodology was conducted in vertisols of Rahuri during *Kharif* 2007-08 with Bt cotton (var. Mallica NCS-207). The soil of the experimental field was clayey in texture with pH 8.1 and EC 0.30 dSm⁻¹. The initial KMnO₄-N – Olsen – P and NH₄OAC – K status were 191.6, 17.69 and 449.8 kg ha⁻¹, respectively. Following the inductive methodology of Ramamoorthy *et al.* (1967), three fertility gradients were