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Effect of fertilizer management on yield and economics of hybrid Bt cotton

J.M. MODHVADIA, J.N. NARIYA, K.N. VADARIA **AND** R.B. THANKI

ABSTRACT

A field experiment was conducted at Cotton Research Station, Junagadh Agricultural University, Junagadh (Gujarat) during *Kharif* seasons of 2006-07 and 2007-08 to find out the effect of fertilizer management on productivity and economics of hybrid Bt cotton (*Gossypium hirsutum* L.). Conjunctive use of nitrogen, phosphorus and potassium in collaboration with 240kg N ha^{-1}+ 50kg P_2O_5 ha^{-1} +120 kg K_2O ha^{-1} fertilizer doses produced significantly higher seed cotton and stalk yield of Bt cotton as compared to its counterpart of N, P and K, whether applied alone or in combination with NPK. The yield attributes like number of bolls per plant, boll weight (g), number of seeds per boll, 100-seed weight (g) and ginning % increased by considerably, it was found that fertilizer management of nitrogen , phosphorus and potash higher levels gave higher net income per hectare (Rs. 52902/ha.) and B:C ratio (2.12) as compared to lower levels of NPK.

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Key words : Bt cotton, N, P_2O_5, K_2O, Yield, Economics

INTRODUCTION

Cotton (*Gossypium hirsutum* L.), the white gold is one of the most important commercial and industrial crops and plays a key role in economical and social affairs of the world. It is considered as "King" of fibres and being important cash crop of the country, benefits several million people who are engaged in its cultivation, trade, processing, manufacturing etc. It provides employment to nearly 10 million peoples in the decentralized sector. India now stands first in area i.e. 7.64 million ha and third in total production with an annual production of 13.69 million bales. However, the average productivity in India is 555 kg lint ha^{-1} and is far behind of those in Israel (1709), Australia (1636), Turkey (1259), China (1245), USA (976), Pakistan (656) and the world average of 677 kg lint ha^{-1} (CCI, 2005). The main cause of lower productivity of cotton in India is severe damage caused by boll worm complex. But after introduction of transgenic cotton, the area under cotton cultivation increased in Gujarat and other cotton growing states. The production potential of cotton crop is the resultant effect of a number of interacting factors contributing its shares. Major nutrients (N, P and K) are important for increasing the crop production. Among them, nitrogen is the decisive as well as expensive input which determines the crop production. It has quickest and the most pronounce effect on plant growth. Phosphorus is another essential element for formation and better developments root systems.

MATERIALS AND METHODS

A field experiment was carried out during the *Kharif* seasons of 2006-07 and 2007-08 at Cotton Research Station, Junagadh Agricultural University, Junagadh (Gujarat). The soil of the experimental field was clayey in texture, calcareous in nature and slightly alkaline in reaction (pH 7.99) having ECe 0.44 dSm^{-1}, organic carbon 0.33 per cent, available N 301.00 kg ha^{-1}, available P 34.26 kg ha^{-1} and available K_2O 562.0 kg ha^{-1}. The soil was medium in available N, P and K. Twenty four treatments combinations consisted of three levels of N (N_1 = 160, N_2 = 200 and N_3 =240 kg ha^{-1}), two levels of P_2O_5 (P_1=0 and P_2=50 kg ha^{-1}) and four levels of K_2O (K_1=0, K_2=60,

Correspondence to :
J.M. MODHVADIA, Cotton Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

Authors' affiliations:
J. N. NARIYA, K.N.VADARIA AND R. B. THANKI, Cotton Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA