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Research Article

Effect of potassium and zinc on growth, yield, quality parameters and nutrient uptake by Bt cotton

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Summary

A field experiment was conducted during 2009-11 to 2011-12,on medium black calcareous soil (*Typic Ustocrepts*) with hybrid Bt cotton (NH 44) using seven levels of K_2O (0,120, 150, and 180 kg ha^{-1} and each in split application, 1/2 at basal and 1/2 at 45 DAS) and two levels of $ZnSO_4$ (0, and 50 kg ha^{-1}) at Cotton Research Station Junagadh Agricultural University, Junagadh. The results showed that the significantly higher average seed cotton (2313 kg ha^{-1}) and stalk (3208 kg ha^{-1}) yield were recorded with split application of potassium @150 kg ha^{-1}(1/2 at basal and 1/2 at 30 DAS) and basal application of potassium @150 kg ha^{-1}, respectively. Whereas the significantly higher average seed cotton yield (2307 kg ha^{-1}) and stalk yield (3165 kg ha^{-1}) were recorded with application of $ZnSO_4$ @ 50 kg ha^{-1}. The interaction effect of K_{180} x Zn_{50} was also found significant on seed cotton yield(2496 kg ha^{-1}).The significantly higher values of bolls per plant (51.5), five boll weight (23.6g.), oil content (20.88 %), SFI (12.68), sympodial (12.07) and monopodial (2.75) branches per plant and plant height (108.5 cm) were observed with the basal application of potassium @ 150 kg ha^{-1}(K_3). Maximum uptakes of K and Zn by seed cotton as well as stalk were recorded under application of 180 kg K_2O and 50 kg $ZnSO_4$ ha^{-1}, respectively.

Key words : Potassium, Zinc, Cotton yield, Nutrient uptake

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Introduction

Cotton is an important cash crop next to groundnut in Saurashtra region of Gujarat. Cotton is a very good source of natural fibre and to some extent supplementary source of edible oil cotton is very important crop in the economy of the farmers of Saurashtra region of Gujarat. The introduction of hybrid Bt cotton may change the status of area, production and productivity of cotton in Gujarat and other cotton growing states. The hybrid Bt cotton covers the growing areas of 11.14 million hectare in India and 26.33 lakh hectare in Gujarat during 2010-11 (CCI, 2012). The hybrid Bt cotton responded well to higher doses of fertilizers because of high yield potentiality. The yield and some quality parameters of cotton were positively influenced by application of K (Parmar *et al.*, 2010) and Zn (Kashyap *et al*., 1988).

Soil fertility plays a vital role, especially in modern agriculture because production potential is higher in hybrid Bt cotton. At present,fertilizer recommended dose of hybrid cotton is only 160 kg N ha^{-1}, but cotton crop also responded to potassium, because high yield potential varieties of cotton cultivated under intensive cropping area of Saurashtra region of Gujarat. In Gujarat, the Saurashtra region, the availability of potassium is depleted by 27 per cent in last decade. Among the micronutrients, Zn deficiency is wide spread observed in Saurashtra region. No information are available on potassium and zinc response to hybrid Bt cotton particularly in medium black calcareous soils of Saurashtra region (Gujarat) and hence the present investigation was conducted .

Resources and Research Methods

A field experiment was conducted during *Kharif* season