

Research Paper :

Response of cotton to different nitrogen fertilizer sources

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ABSTRACT

A field experiment was carried out in medium black calcareous clayey soils (*Typic Ustocrepts*) during *Kharif* season of 2006 to 2008 at Sagdividi Research Station, Junagadh Agricultural University, Junagadh, with five treatments viz., T₁- Urea., T₂-Urea + Calcium chloride (Balance CAN), T₃-Urea+wettable sulphur (Balance AS), T₄- Calcium ammonium nitrate (CAN) and T₅- Ammonium sulphate (AS) using RBD design with four replications. Nitrogen was applied @ 160 kg ha⁻¹ in three equal splits at basal, 30 and 60 days after sowing (DAS) from each source of treatments. The results showed that different N source treatments did not produced any significant effect on growth, yields and quality parameters of cotton crops but soil available sulphure was influenced after harvest of crop. As per economic point of view, for fertilization of cotton crop, urea fertilizer found cheaper as compare to other nitrogen sources like CAN and Ammonium sulphate

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Cotton is one of the important cash crops in India, occupying about 8.65 Mha and producing 20.18 lakhs tones. The cultivation of cotton in Gujarat is markedly increased in last three years. The hybrid varieties responded well to higher dose of fertilizer as compared to other varieties. Nitrogen is the most important major element and seemed to be more effective for cotton crop. Gadhya *et al.* (2009) reported that the significantly higher seed cotton as well as stalk yield of Bt. cotton were recorded with higher level of N @ 240 kg ha⁻¹. Now a day's farmers widely use the CAN (Calcium Ammonium Nitrate) as a source of nitrogen, it is costly compare to urea. No information is available on sources of nitrogen fertilizer for cotton crop. Hence, the present investigation was studied.

MATERIALS AND METHODS

A field experiments was conducted on medium black calcareous clayey (*Typic Ustocrepts*) soils during *Kharif* seasons of 2006 to 2008 at Sagdividi Rsearch Station, Junagadh Agricultural University, Junagadh with five treatments viz., T₁- Urea., T₂-Urea + Calcium chloride (Balance CAN), T₃-Urea+Wettable sulphur (Balance AS), T₄- Calcium ammonium nitrate (CAN) and T₅- Ammonium sulphate (AS) using RBD design with four replications. Nitrogen was applied @ 160 kg ha⁻¹ in three equal splits at basal, 45 and 90 days after sowing (DAS) as per different source of N fertilizers. The recommendation dose of K₂O was applied @ 120 kg ha⁻¹ as basal. Hybrid cotton variety G-Cot 8 was sown and all agronomic recommendations practices were carried out during period

of experimentation. The field experiment was conducted at different site. Some important chemical characteristics of experiments soils were as follows: pH_{2.5} 7.5-8.05, EC_{2.5} -0.38-0.45 dSm⁻¹, CaCO₃ 25.0-115 gkg⁻¹, available N 215 – 231 kg ha⁻¹, available P₂O₅ 36.7-66.0 kg ha⁻¹, available K₂O 237-392 kg ha⁻¹ and available sulphur 11.5-14.5 kg kg⁻¹.

At maturity, the crop was harvested and growth and yield parameters, seed cotton and stalk yields as well as quality parameters of cotton were recorded. Simultaneously, plot wise, seed cotton and stalk samples as well as soil samples also collected and analyzed for N,P,K and S content in plant and soils using standard methods (Jackson, 1973)

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been presented under following heads :

Yields, yield attributes and quality parameters:

The results (Table 1) showed that the seed cotton yield and stalk yield did not influenced significantly by different treatment of nitrogen sources during individual year as well as pooled, except stalk yield during 2007. The pooled results (Table 2) of yields attributes and quality parameter like oil content (%), ginning percentage, plant height, no. of sympodial branch, 2.5 % SL, fiber elongation (%), fiber strength, SFI, uniformity ratio, micronair and maturity ratio were not influenced significantly by the different nitrogen sources treatments. Yield data showed