GROWTH AND YIELD ATTRIBUTES, YIELD, FIBRE QUALITY AND ECONOMICS OF *Hirsutum* COTTON AS INFLUENCED BY FOLIAR APPLICATION OF KNO₃

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**Abstract**
A field experiment was conducted during *Kharif* season from 2007 to 2009 at C.S. Azad University of Agricultural and Technology, Kanpur (U.P.), India; to study the effect of foliar application of KNO₃ on yield, fibre quality and economics of *hirsutum* cotton. Data indicated that application of KNO₃ and MOP improved significantly all the growth and yield attributing characters over control. Four foliar sprays of 2% KNO₃ produced significantly more seed cotton yield (1621 kg/ha) and lint yield (549 kg/ha) than control by 22.6 and 18.7 per cent, respectively. Significantly higher seed cotton yield (1565 kg/ha) and lint yield (519 kg/ha) were also obtained with 2 foliar application of 3% KNO₃ than control. All the fibre quality parameters were found to be non-significant. Higher gross return (Rs. 48411/ha), net return (Rs. 25169 /ha) and B: C ratio (2.08) were achieved with the application of MOP in four split dose (soil treatment) followed by full dose of MOP as basal (Rs. 46198/ha), (Rs. 22956/ha) and (1.99), respectively, as compared to all the rest treatments.

**Key words**: Economics, fibre quality, foliar application of KNO₃, Lint yield, MOP, seed cotton yield and seed yield.

**Introduction**
Cotton is an important commercial fiber crop of India and plays a significant role in Indian economy by providing 30 per cent of total export earnings. In India, it was grown on a area of about 12.65 mha with the production of 400 lakh bales and productivity of 537 kg/ha during 2014-15. India has 1st rank in production of cotton in the world after China (Anonymous, 2014-15). Among the various ways of supplying nutrient to the crops, the efficient utilization of nutrient by the plants is made through foliar application of nutrient at appropriate stage of crops. Foliar spray of nutrient is one such phenomenon, which regulates the biochemical change in seed and lead to higher productivity by modifying the phenotypic growth characters (Shashtri *et al.*, 2000). Squaring blooming and boll development are the stages when cotton requires highest demand of nutrient. Augment of nutrient supply through foliar application at such critical stages may increase the yield (Bhatt and Nathu, 1986). Therefore, present study was carried out to study the effect of foliar application of KNO₃ on yield, fibre quality parameters and economics in *hirsutum* cotton.

**Materials and Methods**
The field experiment was conducted during *kharif* seasons from 2007 to 2009 at Oil Seed Farm, Kalyanpur of C.S. Azad University of Agriculture and Technology, Kanpur (U.P.), India; to study the effect of foliar application of 2% KNO₃ on growth and yield attributes, yield, fiber quality and economics of *hirsutum* cotton. In all 9 treatments *viz.*, T₁- Control, T₂- Two spray of KNO₃, T₃- Three spray of 2% KNO₃, T₄- Four spray of 2% KNO₃, T₅- Two spray of 3% KNO₃, T₆- Three spray of 3% KNO₃, T₇- Four spray of 3% KNO₃, T₈- Four split dose of MOP (soil treatment) and T₉- full dose of MOP as basal were tested in randomized block design with three replication on *hirsutum* cotton variety (Rs. 2013). The soil of experimental field was sandy loam in texture having pH of 8.0, low in available OC% (0.37), medium in available P₂O₅ (17 kg/ha) and high in available K₂O (270 kg/ha). Cotton planting was done at spacing of 67.5x30 cm on 25.05.07, 30.05.08 and 16-05-09 during 1st, 2nd and 3rd years, respectively. Foliar application of KNO₃ was made at 15 days interval starting with flower initiation during all the years of study. Recommended dose of fertilizer was applied at the rate of 60:30:00 kg NPK/ha whenever, K was applied @ 20 kg/ha as a form of

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MOP with the treatment of $T_8$ and $T_9$. All the agronomic and plant protection measures were followed during crop season. Picking of the crop was done on 18.11.07, 11.12.08 and 30-10-2009 during 1st, 2nd and 3rd years of study, respectively.

**Results and Discussion**

Three years pooled data revealed (table 1) that foliar spray of KNO$_3$, application of MOP in four split dose and full dose of MOP as basal improved all the growth and attributing characters and yield during all the investigation years over control. Application of full dose of MOP as basal produced significantly higher plant height (134 cm) as compared to control (129.9 cm). Significantly more number of bolls/plant (30.4) and boll wt. (2.86g) were recorded with the 4 foliar spray of 2% than control (25.8) and (2.70 g), respectively. All the ancillary characters were found superior with the foliar application of KNO$_3$ than control (Barar and Barar, 2001; Singh et al., 2004; Kumar et al., 2010). Four foliar sprays of 2% KNO$_3$ produced significantly higher seed cotton yield (1621 kg/ha), seed yield (1063 kg/ha) and lint yield (549 kg/ha) than control (1322, 883 and 437 kg/ha), respectively. The increase in yield with the 4 spray of 2% KNO$_3$ was to the tune of 22.6 and 20.3 and 18.7 per cent, respectively over control. Two foliar spray of 3% KNO$_3$ was found to be next best treatment for producing higher seed cotton yield and seed yield followed by four split dose of MOP (soil treatment) during investigation. The increase in the yield with the foliar of KNO$_3$ and four split dose of MOP (soil treatment) might be attributed to more number of boll/plant and boll wt. These results are in conformity with the finding of Barar and Barar (2001), Singh et al. (2004) and Kumar et al. (2010). Significant higher GOT (34%) was observed with the 4 foliar spray of 2% KNO$_3$ over control (33.1%). Application of KNO$_3$ containing both potassium and nitrate applied at the critical growth period helped in retention and development bolls on the plant, which significantly contributed to increase seed cotton yield have been reported by Barar and Barar (2001). Beneficial effects of potassium on yield of seed cotton have also been reported by Nehra et al. (2004). Foliar application of KNO$_3$ and MOP (four split dose in soil treatment and as basal) had no any impact on all the fibre quality parameters. These results are in conformity with the finding of Raj et al. (2009). Highest net return (Rs. 25169/ha) and B : C ratio (2.08) were fetched with the treatment of $T_8$ followed by $T_9$ (Rs. 22956/ha) and (1.99), respectively. The higher net return and B : C ratio (2.08) were fetched with the treatment of $T_8$ followed by $T_9$.
C ratio with $T_s$ and $T_h$ might be due to low cost of cultivation.

References


