

## Effect of nitrogen levels, split application of nitrogen and detopping on seed cotton yield and fibre quality in Bt-cotton\*

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**Abstract:** To find out the requirement of nitrogen, schedule of nitrogen application and feasibility of detopping for Bt-cotton and to assess their effects on growth, yield and fibre quality parameters, field experiment was conducted at Agriculture Research Station, Dharwad for two years (2005-06 and 2006-07) under irrigated conditions. Results indicated that increasing level of nitrogen from 80 to 120 and further to 160 kg/ha significantly increased seed cotton yield by 12 and 19 per cent, respectively. Application of N with recommended method of three splits (2267 kg/ha) was similar to application seven times (2237kg/ha). Detopping of Bt- cotton at 80 DAS did not improve the seed cotton yield significantly, but it reduced the plant height when compared with normal crop of cotton. In general, Bt-cotton with 120 kg N / ha applied in 4 splits and detopping (D<sub>1</sub>N<sub>2</sub>S<sub>2</sub>) produced fibers with greater fibre length, uniformity percentage, maturity ratio and fibre strength parameters as compared to other interactions. Hence the present recommendation of N can be enhanced to 120 kg/ha with present recommended schedule of application to increase yield and fibre quality under Dharwad conditions.

**Key words :** Nitrogen levels, detopping, quality parameters, split application

### Introduction

In India, cotton is only genetically modified crop, cultivated commercially. Research premises have developed capabilities in engineering various Bt-crops preferably cotton and maize to combat with *Helicoverpa* species, and from 1996 itself these crops are being cultivated commercially in USA, Australia, China and other countries. India has got over 34.61 lakh hectares of Bt-cotton area covering nearly 37.9 per cent of the total cotton area of the country during 2006-07 (Anon, 2007).

Production and productivity of cotton increased after the introduction of Bt-cotton in the country. Immediate attempts to find out basic agronomic requirements of Bt-cotton as well as practices, which can help in minimizing the insect incidence, are the need of an hour. Research on cotton under various soil and climatic conditions has revealed beneficial effect of nitrogen application on the growth, yield and quality of cotton. Beneficial effect of N was confirmed with ideal dose of requirement and it was standardized at specific growing conditions.

N is the most essential nutrient for plant growth needs to be supplied in proper time and quantities. A positive correlation between vegetative growth and the number of fruiting points produced by cotton is well known. N supplement therefore by split application becomes important as it is supplied ideally in a time when crop critically requires. Bt-cotton differs in its requirement either by total or part of it in the different

stages of crop. Thus, nitrogen use efficiency can be increased and better used to attain the objective of higher production. Information on critical stages of N management to Bt cotton is not known. Growth modification practices become more important by converting its phase of vegetative to reproductive growth. Removing top terminal portion by detopping of cotton after prominent vegetative growth stage may be promising for encouraging growth of already formed sympodials as well as more formation and development of fruiting bodies. Detopping may also help to reduce sucking pest and bollworm problems. Hence study was undertaken to find out the requirement of nitrogen, schedule of nitrogen application and feasibility of detopping for Bt-cotton and to assess their effects on growth, yield and fibre quality parameters, at Agriculture Research Station, Dharwad.

### Material and methods

Field experiment was conducted for two years (2005-06 and 2006-07) at Agriculture Research Station, University of Agricultural Sciences, Dharwad, Karnataka. Soil of the site was medium deep black and neutral in its pH (7.6), Available N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were in the class of low (223 kg/ha), medium (29.2 kg/ha) and high (371 kg/ha), respectively. Experiment was laid out in split-split plot design with three replications. Detopping and no detopping treatments were assigned to main plots and three levels of N (80, 120 and 160 kg/ha) to sub plots. Scheduling of N

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