

Study of LAD, RDMP and CGR of late sown Bt Cotton (*Gossypium hirsutum* L.) as influenced by different plant spacings, fertilizer levels and NAA applications under irrigation

VISHWANATH BIRADAR

Agricultural Research Station, BIDAR (KARNATAKA) INDIA

ABSTRACT

A field experiment was conducted on medium black soil to study the LAD, RDMP and CGR of late sown Bt cotton as influenced by different plant spacings, fertilizer levels and NAA applications under irrigation during 2006-07 at College of Agriculture, Raichur farm, University of Agricultural Sciences, Dharwad. The results of the investigation indicate that Leaf area duration (LAD) between 46 and 90 and 91 and 135 DAS, 90 x 30 cm spacing recorded significantly higher LAD (54.82 and 106.65 days, respectively), 150 per cent RDF (44.78 and 88.87 days, respectively) and three sprays of NAA (44.78 and 89.10, respectively). Rate of dry matter production (RDMP) between 46 to 90 and 91 and 135 DAS was significantly higher with 90 x 60 cm spacing plant spacings (5.49 and 3.92 g plant⁻¹ day⁻¹, respectively), 150 per cent RDF (5.42 and 4.03 g plant⁻¹ day⁻¹, respectively) and three sprays of NAA (5.42 and 4.15 g plant⁻¹ day⁻¹, respectively). Crop growth rate (CGR) between 46 and 90 and 91 and 135 DAS was significantly higher with 90 x 30 cm plant spacings (18.98 and 14.05 g m⁻² day⁻¹, respectively), 150 per cent RDF (14.33 and 10.75 g m⁻² day⁻¹, respectively) and three sprays of NAA (14.41 and 11.07 g m⁻² day⁻¹, respectively). The interaction effects were non significant.

Key words : LAD, RDMP, CGR, Bt cotton, Spacing, Fertilizer levels, NAA sprays

INTRODUCTION

Indian government is now looking for many ways to improve the production of cotton in order to boost the economy. In addition, it is also looking to boost production of edible cotton seed oil to help and feed India's growing population of one billion people (James, 2004). Under this context, in India genetically modified cotton hybrids resistant to bollworms have been developed and released for commercial cultivation in 2001-02. The preliminary investigation on Bt cotton proved that Bt hybrids are early in maturity and resistant to bollworm. Possibly for this reason, Bt cotton performs better than other hybrids under delayed sowing condition (Sankaranarayanan *et al.*, 2004). Hence, it is necessary to develop production technology for Bt cotton under late sown situations. In the present study, attempt was made to study the economics of late sown Bt cotton as influenced by different plant spacings, fertilizer levels and NAA applications under irrigation in vertisol in the Deccan zone.

MATERIALS AND METHODS

The field experiment was conducted during 2006-07 in medium black at College of Agriculture, Raichur, farm University of Agricultural Sciences, Dharwad (Karnataka). The experiment was laid out with a split-split plot design. There were 18 treatment combinations replicated three times with three plant spacings (90 x 30 cm, 90 x 45 cm, 90 x 60 cm) in main plots, fertilizer levels

(100 % RDF and 150 % RDF) in sub plots and growth regulator sprays (control (water spray), NAA @ 10 ppm-two sprays at flower commencement and full blooming stage and NAA @ 10 ppm-three sprays at squaring, flower commencement and full blooming stage) in sub-sub plots. The recommended dose of fertilizer (RDF) for cotton comprised of 150:75:75 NPK kg ha⁻¹.

The cultivar used was Bunny Bt. The crop was sown by delaying one and half month beyond optimum schedule on 25th September, 2006. The other cultivation practices were followed as per recommended package.

RESULTS AND DISCUSSION

Leaf area duration (LAD) between 46 and 90 and 91 and 135 DAS varied significantly due to spacing levels. The data revealed that between 46 to 90 DAS, 90 x 30 cm spacing recorded significantly higher LAD (54.82 days) than 90 x 45 cm (40.42 days) and 90 x 60 cm (33.94 days) spacings. Similar trend was observed between 91 to 135 DAS (Table 1).

LAD was significantly influenced by fertilizer levels between 46 to 90 DAS and 91 to 135 DAS. Between 46 to 90 DAS, application of 150 per cent RDF produced significantly higher LAD (44.78 days) over 100 per cent RDF (41.34 days). The LAD recorded between 91 to 135 DAS followed similar trend (Table 1).

LAD differed significantly due to NAA sprays between 46 to 90 and 91 to 135 DAS. Between 46 to 90 DAS, significantly higher LAD (44.78 days) was recorded