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## Physiological and Biological parameters of BT cotton as influenced by different plant growth regulators

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### Abstract

It is well known that the thousands of physiological processes are undergoing in plants simultaneously which ultimately decide the plant growth and development and the final yield. Plant growth regulators has been shown to influence these parameters in one way or the other. Relative water content was highest in Mepiquat Chloride 15ml/10 lit at 45 DAS + 80 DAS as compare to other treatment at 60 DAS and 90 DAS. Chlorophyll content was also found highest in treatment Mepiquat Chloride 15ml/10 lit at 45 DAS+ 80 DAS as compare to other treatment at 60 DAS and 90 DAS.

**Keywords:** Physiological, biological parameters, plant, regulators

### Introduction

Cotton (*Gossypium hirsutum*. L) Is one of the most important commercial cash crop, important fibre crop of global significance and cultivated in more than seventy countries. It is an important raw material of economy in terms of both employment generation and foreign exchange and hence it is known as: 'White gold' or 'friendly fibre and king of fibre'. The cotton plant belongs to the genus *Gossypium* of the family Malvaceae. Cotton is one of the principle crop of India and plays a vital role in the country's economic growth by providing substantial employment and making significant contributions to export earnings.

### Material and Method

The field experiment was conducted during *Kharif* season of 2017 at the experimental farm, Department of Agril. Botany, Vasandrao Naik Marathwada Krushi Vidyapeeth, Parbhani Experiment was laid out in randomized block design as per the plan after preparatory cultivation. The layout consisted of thirty experimental plots in three replications. Data on growth and yield attributes were recorded from five randomly selected plants in each treatment plot. The experiment comprising BT cotton hybrid Ajeet-155 and using PGRs to study effect of spraying on plant growth and yield of cotton. By using PGRs with different proportion such as Ethrel 100 ppm at 45 DAS+ 80 DAS, MH 750 ppm at 45 DAS+ 80 DAS, MH 1000 ppm at 45 DAS+80 DAS, Ethrel 100 ppm at 45 DAS+MH750 ppm at 80 DAS, Ethrel 100 ppm at 45 DAS+ MH 1000 ppm at 80 DAS, Cycocel 100 ppm at 45 DAS +80 DAS, Cycocel 150 ppm at 45 DAS+80 DAS, Mepiquat Chloride 10ml/10 lit at 45 DAS+80 DAS, Mepiquat Chloride 15ml/10 lit at 45 DAS+ 80 DAS.

### Statistical analysis and interpretation of data

The data recorded on various variables were statistically analyzed by using technique of analysis of variance and significance was determined as given by Panse and Sukhatme (1967). Whenever differences were significant, C.D. values were indicated for comparison otherwise only the values of SE  $\pm$  were indicated. Graphical illustrations of data have been given at appropriate places. The critical difference was worked out whenever the treatment effects were statistically significant

### Result

The effect of Ethrel, MH, Cycocel, Mepiquat chloride on morphological characters like plant height, internode length, monopodia and sympodia, leaf area and dry matter indicated that these parameters differed significantly due to plant growth regulators. It is further evident that the Ajeet-155 hybrid of BT cotton differed significantly with respect to all the morphological characters by different plant growth regulator treatments.

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Application of Cycocel and Mepiquat chloride which are anti-gibberlin dwarfing agents, the reduced plant height was due to retardation of transverse cell division and maintain balance of source sink. The plant height (cm) was found significantly lowest in treatment Mepiquat Chloride 10 ml/10 lit at 45 DAS + 80 DAS and Mepiquat Chloride 15ml/10 lit at 45 DAS + 80 DAS as compared to other treatments and control in all growth stages. The internode length (cm) was found significantly lowest in Treatment T<sub>8</sub> (Mepiquat Chloride 10 ml/10 lit at 45 DAS + 80 DAS) (18.6-19.9 cm) and T<sub>9</sub> (Mepiquat Chloride 15ml/10 lit at 45 DAS + 80 DAS) (19.2-19.4 cm) as compared to other treatments and control in all growth stages. Sympodial branches arise from monopodial branches and are the reproductive branches on which fruiting bodies develop. Growth regulator treatment differed significantly among themselves for the number of sympodial branches plant<sup>-1</sup> during crop growth seasons. At 100 days after sowing, sympodial branches was influenced significantly due to various treatments that the treatment T<sub>9</sub> (Mepiquat Chloride 15ml/10 lit at 45 DAS+ 80 DAS), T<sub>8</sub> (Mepiquat Chloride 10ml/10 lit at 45 DAS+80 DAS) and T<sub>2</sub> (MH 750 ppm at 45 DAS+ 80 DAS) was found to be significantly superior over rest of the treatments of plant growth regulators for number of sympodial branches per plant at 100 DAS and at harvest. The leaf area (cm<sup>2</sup>) was found significantly lowest in Treatment T<sub>8</sub> (Mepiquat Chloride 10 ml/10 lit at 45 DAS + 80 DAS) and T<sub>9</sub> (Mepiquat Chloride 15ml/10 lit at 45 DAS + 80 DAS) as compared to other treatments and control. The dry matter of plant was found significantly lowest in T<sub>8</sub> (Mepiquat Chloride 10 ml/10 lit at 45 DAS + 80 DAS) and T<sub>9</sub> (Mepiquat Chloride 15ml/10 lit at 45 DAS + 80 DAS) as compared to other treatments and control.

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