

Title: Physiological manipulation of Bt plant morphoform for enhanced productivity under varied agro-climatic conditions

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INTRODUCTION

Bt cotton is gaining rapid acceptability among cotton growers. It is postulated that its productivity can be enhanced through modification in its morphoform and manipulation of the effective boll setting period, either by mechanical or chemical treatments.

OBJECTIVES

1. To study the temporal and spatial distribution of fruiting forms in Bt Vs non-Bt (medium and long duration Bt hybrids)
2. To understand the consequences of altered sink activity on physiology and growth of the plant,
3. To formulate product(s) to manipulate morphoforms to maximize yield gap

ACTIVITIES

In a factorial experiment the effect of mechanical and chemical treatments viz.

- Control
- 5.7 m Molar solution (0.75 ml/L) ethrel at 35-40 DAS (i.e. square initiation)
- 8.56 m Molar solution (1.125 ml/L) ethrel at 35-40 0 A S (i.e. square initiation)
- Mechanical removal of squares (once) at square initiation were evaluated on 4 Bt hybrids viz. RCH 2 Bt, JKCH 99 Bt,

NECH LR Bt, NCS 138 Bt along with a Local check (Hybrid).

EXECUTIVE SUMMARY

Application of 5.70 or 8.56 Molar solutions of Ethrel at square initiation stage was effective in shedding of young leaves within 48 hrs after spray. It also altered the morphoform and boll setting pattern of the plants. There was significant increase in seed cotton yield compared to control at most of the centers. Fibre quality variation due to ethrel application was either non-significant or inconsistent.

SALIENT FINDINGS

There was drop of all the young squares within 48 hours after spray of Ethrel @ 5.70 and 8.56 solution. There was a temporal shift in the emergence of new flush of squares. At Guntur, it was observed that there was ancillary bud initiation at early stage and decline in apical dominance (Fig. 1) Ethrel application also altered the morphoform of the plant and boll setting pattern. Significant variation in yield and fibre quality parameters was noticed among cultivars. Fibre quality variation due to ethrel application were either non-significant or inconsistent. Application of ethylene in the form of ethrel was found to be optimum to bring about a change in crop ideotype that will help in enhancing the yield by 30-40% over the control. Cultivar x ethrel interaction was significant for harvest index (HI) at Lam, Guntur. At CICR, Nagpur, ethrel application improved the harvest index.



Treated



Control



Treated



Control



Treated



Control

Fig. 1 : Morpho frame alteration through application of etherel

