

Research
Paper

Effect of topping on growth and yield of hybrid cotton (*Gossypium hirsutum*)

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ABSTRACT

A field investigation was carried out at the main cotton research station, Navsari Agricultural University, Surat (Gujarat) to study the effect of topping on cotton (*Gossypium hirsutum*) cv. G. Cot. Hy-6. Seed cotton yield was not affected significantly by topping, but reported higher yield with late topping (90 to 100 DAS). Plant height was significantly influenced by topping.

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Key words : Topping, Hybrid cotton, Yield

INTRODUCTION

Cotton (*Gossypium hirsutum*) is one of the most important commercial and industrial crop playing a key role in economical and social affairs of the world. It is considered as a king of fibers. About 80 per cent of raw materials require for textile industries contributing from cotton alone. India occupies the first place in acreage but stands fourth in production among the 60 cotton producing countries of the world. With introduction of Bt cotton in India the productivity is increased and reaches up to 402kg lint/ha. The cotton requirement is increasing world wide and it is estimated that by 2020 about 475 lakh bolls cotton require for this productivity might be increase up to 1000 kg/ha.

Growth of the crops varies from place to place according to soil fertility and climate. Excessive growth of the cotton often occurs in certain highly fertile soils in cotton belt. Advance climatic conditions like continues rains, cloudy weather with high atmospheric humidity cause excessive vegetative growth at the expense of fruiting bodies, which leads problem like lodging, boll rot, increased insect activity and low picking efficiency.

Topping is a clipping of growing tips of plant. Topping eliminated lodging of a fairly susceptible variety of cotton,

which developed stronger main stem and branches. The main aim of topping is to get a good architecture plant type so that plant can get required sunlight with minimum of mutual shading and thus picking efficiency can be increased with the advancement of crop.

MATERIALS AND METHODS

The field experiment was conducted at the main cotton research station, Navsari Agriculture University, Surat (Gujarat). Cotton hybrid G.Cot.Hy-6 was planted at the spacing of 120cm x 45cm with onset of monsoon (June). The climate of the crop season were found normal and favourable for satisfactory growth of the cotton crop. Total 1320mm rainfall received during June to September. Soil type was black cotton clay soil with PH 7.7 low in OC (0.49%) and available P₂O₅ (19 kg/ha) and available K₂O (530 kg/ha). The experiment was laid out in randomized block design with four replications. Topping treatments included: (i) No topping (control), (ii) Topping at 60 DAS, (iii) Topping at 70 DAS, (iv) Topping at 80 DAS, (v) Topping at 90 DAS, and (vi) Topping at 100 DAS. In topping, growing point of main stem was only clipped by hand as per treatment. The crop was fertilized with 320kg N/ha in four equal splits at basal and 30 days

interval, other agronomical and plant protection measures were taken as per recommendation. At the end of season, plant height, number of branches, number of bolls/plant, dry weight of plant, boll weight and seed cotton yield were recorded and statistically analyzed as per standard procedure.

RESULTS AND DISCUSSION

Early topping restrict plant growth and reported significantly lower plant height. Maximum plant height(132cm) was observed with control (*i.e.* no topping), but topping at 100 DAS restricted plant height up to 78cm. Number of sympodial branches were also reduced with the early topping. Similarly dry weight of plant was also less with early topping while late topping at 100 DAS and control plots recorded similar dry weight of plant. Similar result was reported by Ahlawat(1973), Venkitaswamy and Inruthayaraj(1984), Ankaiah *et al.*(1987), El-Halawamy *et al.*(1990), Ahmed *et al.*(1992) and Rahman *et al.* (1992).

Yield attributes:

Maximum numbers of bolls/plant were recorded with topping at 90 DAS (66) and lower with the topping at 60 DAS (55). However, there were no significant differences among the various treatments. Similarly boll weight under different treatments remained statistically at par.

The seed cotton yield (kg/ha) under various treatments remained statistically similar but early topping at 60 DAS had numerically lower yield than late topping. This may be due to the arrest of natural growth of terminal bud, which resulted in the production of more monopodia, ultimately resulting in poor yield. While in no topping due to profuse vegetative growth with restrict transporting photosynthates to the fruiting parts caused poor and smaller boll formation. Topping at 90 or 100 DAS arrest further vegetative growth resulted in increased boll setting and bigger boll and ultimately in higher yield. Yield data presented in Table 1 show that late topping *i.e.* 80 to 100 DAS increased yield than no topping, it may be due to better architectural plant which may increase penetration of sunlight in canopy because of reduced foliage and lodging resulted in higher photosynthetic activity, as well as more spread of plant which also harvest more sunlight and more photosynthesis. The result also confirm the findings of Selvaraj *et al.* (1987), Ahmed *et al.*(1992), Rahman *et al.*(1992) and Aleeva *et al.*(1992).

Treatments	Plant height (cm)	No. of sympodia	No. of monopodia	Dry weight of plant (g/plant)	Number of bolls/plant	Boll weight (g)	Seed cotton yield (kg/ha)
1. No topping	132	2.96	1.32	97	63	3.72	2783
2. Topping at 60 DAS	39	5.10	39	78	55	3.16	2279
3. Topping at 70 DAS	55	5.00	55	59	58	3.52	2319
4. Topping at 80 DAS	63	7.75	63	86	59	3.78	2716
5. Topping at 90 DAS	76	7.65	76	89	66	3.95	2757
6. Topping at 100 DAS	78	7.20	78	97	60	3.97	2572
NS (P < 0.05)	NS	NS	NS	NS	NS	NS	NS

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