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EFFECT OF GROWTH REGULATORS IN COTTON MCU 9

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ABSTRACT

Experiments were conducted at the Tamil Nadu Agricultural University, Coimbatore during the winter seasons of 1986-87 and 1987-88 under All India Coordinated Cotton Improvement project to screen the suitable growth regulators/hormones for MCU 9 cotton. The growth regulators tested are triacontanol at 2.5, 5.0 and 7.5 ppm with and without DAP 3% chlormequat K_2O, NAA with and without DAP 3%, Recine, Atonik and Cytocyme. The results revealed that foliar spray of NAA 40 ppm at 45, 60 and 75 days after sowing or spraying of triacontanol 7.5 ppm or triacontanol 5.0 ppm with or without DAP 3% increased the seed cotton yields compared to water spray (Control).

KEY WORDS : Cotton, Growth Regulators, Yield.

Boll shedding is one of the major disorders affecting the yield potential of the cultivated cotton. Besides insect pests, physiological disorders caused by environmental stresses accelarate boll shedding. Many investigations have reported the beneficial effect of different chemicals to increase the seed cotton yield by enhancing the flowering and reduce boll shedding. (Kulandaivelu, 1974; Venkitaswamy and Iruthayaraj, 1983; Mehetre *et al.*, 1990). Hence, a field experiment was conducted to indentify the suitable chemical growth regulator/hormone for MCU 9 cotton.

MATERIALS AND METHODS

Field experiments were conducted at the Tamil Nadu Agricultural University, Coimbatore during the winter seasons of 1986-87 and 1987-88 under All India Coordinated Cotton Improvement project to screen growth regulator/ hormone for MCU 9 cotton . The treatments during 1986-87 were:

Triacontanol 2.5 ppm (T_1)
Triacontanol 2.5 ppm + DAP 3% (T_2)
Triacontanol 5.0 ppm (T_3)
Triacontanol 7.5 ppm + DAP 3% (T_4)
Triacontanol 7.5 ppm (T_5)
Triacontanol 7.5 ppm +DAP 3% (T_6)
Triacontanol 1.25 ppm (T_7)
Chlormequat (cycocel) 40 ppm (T_8)
Foliar spray of 3% K_2O (T_9)
NAA 40 ppm (T_{10})
NAA 40 ppm + DAP 3% (T_{11})
Water spray (T_{12})
Recine 1.5 ml litre^{-1} (T_{13})
Sodium 5-nitroguaiacolate + sodium 1-nitrophenolate + Sodium 4- nitrophenolate (Atonik) 2.0 ml litre^{-1} (T_{14}) and
Cytocyme 1.0 ml litre^{-1} (T_{15})

In the second year, treatments T_2, T_3, T_4, T_5, T_6, T_{10}, T_{11} , T12 and T15 were alone tested and the remaining treatments had been excluded from the experiment based on the first year result. All the chemicals were sprayed at 45, 60 and 75 days after sowing. The soil of the experimental field was clay loam with 176 kg ha^{-1} available N, 18 kg ha^{-1} available P2 and 640 kg available K_2O ha^{-1}.

MUC 9 cotton was sown on 18 August 1986 and 26August 1987 during the first and second year respectively. Recommended dose of 80:40:40 kg NPK ha^{-1} was applied. Half of the N and full dose P_2O_5 and K_2O were applied as basal and the remaining half of the N was applied at 45 days after sowing. Necessary irrigation and need based plant protection were given. The details of the results are presented in Table 1.

RESULTS AND DISCUSSION

Plant height was not influenced by any of the growth regulators during both the years of experimentation (Table 1). Triacontanol 5 ppm recorded highest number of sympodial branches per plant and it was on par with Triacontaonl 7.5 ppm and NNA 40 ppm + DAP 3% during the first year (1986-87) and there was no difference among the nine treatments during the second year (1987-88). During 1986- 87, spraying Triacontanol 5.0 ppm and 7.5 ppm and NAA 40 ppm produced higher number of bolls per plant. During 1987-88, spraying of NAA 40 ppm, NAA 40 ppm +DAP 3%, Triacontanol 5.0 ppm + DAP 3% and

Table 1. Effect of growth regulators on growth characters, yield attributes and yield of seed cotton MCU 9

Treatments	Plant height (cm)		Number of sympodial branches plant^{-1}		No. of bolls per plant		Boll setting %	Seed control yield (kg ha^{-1})	
	86-87	87-88	86-87	87-88	86-87	87-88		86-87	87-88
Triacontanol 2.5 ppm	77.7		11.7		12.7			1599	
Triacontanol 2.5 ppm + 3% DAP	81.8	97.0	13.1	9.5	10.9	14.8	29.7	1736	507
Triacontanol 5.0 ppm	87.6	94.3	14.8	11.0	14.3	12.3	35.2	2276	668
Triacontanol 5.0 ppm + 3% DAP	85.2	93.3	12.4	9.7	12.3	16.0	30.9	1768	616
Triacontanol 7.5 ppm	90.4	87.7	13.8	9.7	14.0	16.7	30.9	2259	632
Triacontanol 2.5 ppm + 3% DAP	87.9	96.0	11.9	9.4	12.3	16.2	30.8	2048	577
Triacontanol 1.25 ppm	78.5		11.2		10.9			1294	
Cycocel 40 ppm	63.0		12.7		10.8			1108	
Foliar spray 3% K_2O	78.6		11.9		10.2			1526	
NAA 40 ppm	84.7	90.3	14.3	11.1	13.3	17.3	33.4	1790	683
NAA 40 ppm + 3% DAP	84.7	88.0	13.7	10.8	11.7	16.0	29.3	1710	591
Water spray	75.7	96.7	10.9	8.9	10.1	13.9	29.5	1225	484
Recine 1.5 ml litre^{-1}	78.8		12.5		11.2			1559	
Atonik 2.0 ml litre^{-1}	83.3		11.9		10.9			1645	
Cytocyme 1.0 ml litre^{-1}	85.1	94.3	11.8	10.4	10.6	13.9	27.9	1880	521
CD (5%)	NS	NS	1.4	NS	1.6	NS	2.7	327	136

Triacontanol 5.0 ppm recorded higher number of boll setting percentage, indicating their ability to increase the productivity of cotton.

During 1986-87, foliar spray of three rounds of Triacontanol 5 ppm recorded highest seed cotton yield with 2276 kg ha $^{-1}$ and was on par with Triacontanol 7.5 ppm and Triacontanol 7.5 ppm + DAP 3% with 2259 and 2048 kgs ha^{-1} respectively. Spraying of NAA 40, NAA 40 ppm + DAP 3% and cytocyme 2.0 ml. litre $^{-1}$ recorded higher seed cotton yields. The increase of yields in the above treatments are due to increase number of sympodial branches per plant and number of bolls per plant. During 1987-88, foliar spray of 3 rounds of NAA 40 ppm recorded highest seed cotton yield of 683 kg ha^{-1} and was on par with Triacontanol 7.5 ppm, Triacontanol 5.0 ppm, Triacontanol 5.0 ppm + DAP 3% with seed cotton yield of 668, 632 and 616 kg ha^{-1} respectively. The lowest dose Triacontanol 2.5 ppm +DAP 3% and water spray was effective with the lowest yields of 507 and 484 kg ha^{-1} respectively. The increased yield with NAA and Triacontanol in the above treatments were due to increased boll setting percentage. Increased seed cotton yields due to NAA application was also reported by Goyal *et al*, (1988), Vyakaranahal *et al.* (1989) and Mehetre *et al.* (1990).

It can be concluded that spraying 3 rounds of NAA 40 ppm on 45th, 60th and 75th day after sowing or Triacontanol 5.0 ppm with or without DAP 3% and Triacontanol 7.5 ppm was more effective in increasing the yield of cotton MCU 9.

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