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Effect of different growth retardants on flowering, yield and economics of okra (*Abelmoschus esculentus* L. Moench) cv. GO-2 under South Gujarat conditions

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ABSTRACT

The perusal of results indicated that foliar application of CCC 300 ppm at 25 and 50 days after sowing retarded duration of reproductive phase, reduced day to first flower opening and internodal length. However, fruit yield per plant (g) numbers of fruits per plant and fruit yield per hectare (t/ha) was also noted highest in the same treatment. Whereas fruit quality *i.e.* crude fibre content was found non-significant. Meanwhile, highest net return with higher cost benefit ration was also produced under the treatment of CCC 300 ppm as compared to rest treatments.

Key words : Okra, Growth retardants, Flowering, Yield, Economics.

Okra (*Abelmuschus esculentus* L. Moench) is an important vegetable among other vegetables, having good demand throughout the year for its tender fruits. India is the largest producer of okra in the world. Total area under okra cultivation in India is estimated to be 3.6 lakh hectares with an annual production of 35 lakh tones (Shanmagasundaram, 2004). The area under okra cultivation in Gujarat is 35908 hectares, with the production of 299136 MT (Anon., 2005). In recent years, scientists have given attention to the idea of regulating plant growth *viz*., CCC, MH and ethrel as third most important factor in improving the growth, yield and quality with the application of plant growth substances in various ways. It helps in efficient utilization of metabolites in certain physiological processes going in plant systems. Considering the importance of okra by way of green fruits as vegetable the present study was conducted with reference to Tosh *et al*.(1978) and Sajjan *et al*. (2003) in okra.

MATERIALS AND METHODS

The study was undertaken to see the effect of growth retardants on okra cv. GO-2 during the summer season of 2005 at College Farm, Navsari Agricultural University, Navsari. The variety 'GO-2' was selected for the present study because the fruits of this variety are green, tender and attractive which will fetch the higher price in market. Moreover, it is resistant to yellow vein mosaic virus (YVMV) and suitable for both summer and *kharif* seasons. The experiment was carried out in Randomized Block Design with ten treatments having three replication. The treatments comprising different concentrations of CCC (100, 200 and 300 ppm), MH (150, 200 and 250 ppm), Ethrel (100, 200, 300 ppm) and control. All foliar spray was given at 25 and 50 days after sowing.

RESULTS AND DISCUSSION

Effect of growth retardants on flowering and yield attributes:

The earlier flowering (37.26 days) with broader reproductive phase (67.20 days) was noted with CCC 300 ppm as compared to control and rest treatments which might be due to suppression of vegetative growth which leads to less demand for food materials synthesized by treated plant. Thus, the excessive carbohydrate reserves might have induced early flowering and accelerated reproductive phase of the plant. The yield parameters were also significantly affected by different growth retardant treatments during this experimentation. The foliar application of CCC 300 ppm recorded appreciable response on all yield characters *i.e.* maximum length and diameter of fruit, number of green fruits per plant, fresh weight of fruit, yield of fruits per plant, fruit yield per hectare. The improvement and increase in fruit yield might be due to CCC which reduces plant height and increased number of branches resulting in diversion of flow of food materials for improvement of flowering and fruiting (Table 1). Similar trends of results also obtained by Tosh *et al.* (1978) and Sajjan *et al.* (2003) in okra.

Effect of growth retardants on quality:

There was no significant effect of plant growth

Table 1: Effect of growth retardants on flowering, yield and quality characters of okra cv. GO-2

Treatments		Days to first flower to open	Reproductive phase (days)	Fruit length (cm)	Fruit diameter (cm)	Number of green fruits per plant	Fresh weight of fruit (g)	Fruit yield per plant (g)	Fruit yield (t/ha)	Crude fibre content (%)
T_1	CCC 100 ppm	39.31	56.43	11.56	1.78	14.00	12.89	221.89	13.45	2.16
T_2	CCC 200 ppm	38.08	62.71	11.72	1.85	14.33	13.54	235.49	14.28	2.19
T_3	CCC 300 ppm	37.26	67.20	12.86	1.93	16.44	13.84	250.24	15.17	2.25
T_4	MH 150 ppm	43.35	54.29	11.34	1.50	14.33	12.69	219.03	13.28	2.44
T_5	MH 200 ppm	43.03	56.17	11.43	1.58	14.45	12.96	221.53	13.43	2.51
T_6	MH 250 ppm	38.83	65.87	12.17	1.90	15.16	13.18	237.28	14.39	2.66
T_7	Ethrel 100 ppm	45.00	43.35	10.08	1.08	12.74	11.68	194.33	11.78	2.42
T_8	Ethrel 200 ppm	44.31	47.72	10.41	1.19	13.16	12.34	204.00	12.37	2.35
T_9	Ethrel 300 ppm	43.57	49.87	10.66	1.27	13.47	12.64	207.00	12.55	2.36
T_{10}	Control	46.40	42.03	9.82	1.00	11.67	10.60	180.38	10.94	2.10
	C.D. (P=0.05)	5.72	10.75	1.03	0.21	2.29	1.12	28.31	1.71	NS
	C.V. %	7.96	11.49	5.40	8.27	3.57	5.17	7.60	7.60	8.25

retardants on okra crude fibre during this study. But, all concentrations of CCC, MH and ethrel noted more crude fibre as compared to control (Table1). This was in accordance with result obtained by Gowda (1983) and Singh (1999) in okra.

Table 2: Economics of okra cv. GO-2 cultivation due to application of growth retardants

Treatments		Yield (t/ha)	Net return (Rs.)	CBR
T_1	CCC 100 ppm	13.45	81508	1:3.12
T_2	CCC 200 ppm	14.28	87856	1:3.32
T_3	CCC 300 ppm	15.17	94584	1:3.53
T_4	MH 150 ppm	13.28	79153	1:2.92
T_5	MH 200 ppm	13.43	79658	1:2.86
T_6	MH 250 ppm	14.39	87312	1:3.13
T_7	Ethrel 100 ppm	11.78	66872	1:2.44
T_8	Ethrel 200 ppm	12.37	69224	1:2.32
T_9	Ethrel 300 ppm	12.55	68296	1:2.12
T_{10}	Control	10.94	62520	1:2.50

Economics:

At last, the maximum cost benefit ratio with higher net return was obtained in CCC 300 ppm treatment. Although, all studied concentrations of CCC and MH during this experiment procured more beneficial features in terms of CBR and net return (per ha. area) as compared to control and rest treatments (Table 2).

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