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## Effect of plant growth regulators and chemicals on fruit setting and yield of mango (*Mangifera indica* L.) var. Kesar

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### Abstract

The present investigation was carried out at Fruit Research station Aurangabad, during the year 2020-21. The experiment was laid out in Randomized Block Design (RBD) with nine treatments replicated thrice. Two foliar spray of plant growth regulators and chemicals was given at pea and marble stage of fruit development. The result of the investigation revealed that, tricentanol 750 mg/L (T4) recorded minimum number of days taken from fruit set to harvest (99.00). Maximum fruit retention at harvesting stage (1.00%), length of fruit (11.58 cm), breadth of fruit (7.09 cm), weight of fruit (270 g), volume of fruit (164.93 cc), number of fruits/plant at harvest (87.67), fruit set at pea stage (14.17%), fruit set at marble stage (7.52%), fruit drop (86.66%), yield/plant (23.67 kg), yield (11.83 t/ha) while treatment control recorded poor results for all above parameters.

**Keywords:** Plant growth regulators, tricentanol, CPPU, Kesar

### Introduction

Mango (*Mangifera indica* L.) is one of the favourite table fruit of tropical and subtropical regions of the world. It belongs to the family *mangiferae* and thought to be originated in Asia. India is the largest producer of mango globally with the production of 21822.3 thousand MT from an area of 2258.1 thousand ha having productivity of 9.7 MT/ha and Maharashtra state production of 791.36 thousand MT from an area of 166.76 thousand ha having productivity of 4.75 MT/ha, (Anonymous 2018) <sup>[1]</sup>. Total area of mango under cultivation was 2212.24 thousand ha and total mango production in India was 19506.20 Thousand MT in the year 2016-17. Total export of mango from India in 2017-18 was 49.18 thousand MT and it gives about 38234.02 lakh rupees.

Although, India is global leader in area and production under mango but still having low productivity and export than some of the countries of the world. Therefore, to promote mango quality production and export a multi-pronged strategy involving high-tech horticultural practices *i.e.* ultra high density plantation, storage and value addition are very crucial. Hence, in recent years increasing productivity coupled with quality is becoming very essential to get more returns from unit area. The farmers are become aware about the value of quality production, as quality fruits fetches higher price in the market. To achieve higher yield of mango so many factors are responsible *viz.* fruit setting, fruit drop, yield per plant etc. All these attributes in response to so many pre harvest practices, the application of plant growth regulator play important role, but the exact information about the specific plant growth regulator and its concentration is lacking. In view of the above specific problems, it was felt necessary to assess the effect of pre harvest application of plant growth regulators and chemicals on yield of mango.

### Material and Methods

The present investigation was carried out at Fruit research station, Aurangabad during the year 2020-21. The experiment was laid out in Randomized block design (RBD) with nine treatments replicated thrice. The five plant growth regulators with different combination of micronutrients were included as treatments *viz.* GA3 35 ppm (T1), CPPU 5 ppm (T2), CPPU 10 ppm (T3), triacontanol 750 mg/L (T4), NAA 50 ppm (T5), NAA 25 ppm + ZnSO4 0.5% (T6), NAA 25 ppm + FeSO4 0.5% (T7), NAA 25 ppm + Borax 0.2% (T8) and Control (T9). Two foliar spray of all the treatments were applied at pea and marble stage of fruit development and observation were recorded at fruit setting to harvesting of fruits.

## Result and Discussion

The result of investigation revealed that there was variation in quality contributing parameters due to application of different plant growth regulators and chemicals. The application of triacontanol 750 mg/L (T4) recorded minimum number of days taken from fruit set to harvest (99.00). Whereas maximum fruit set at pea stage (14.17%), fruit set at marble stage (7.52%), fruit retention at harvesting stage (1.00%), length of fruit (11.58 cm), breadth of fruit (7.09 cm), weight of fruit (270 g), volume of fruit (164.93 cc), number of fruits/plant at harvest (87.67). Fruit drop (86.66%), yield/plant (23.67 kg), yield t/ha (11.83), while treatment control

recorded poor results for all above parameters. Triacontanol helps to reduce fruit drop at pea and marble stage because of as it inhibits formation of abscission layer at fruit neck, resulting higher fruit retention at harvesting stage. However number of fruit at harvesting stage is higher as compared to control. Similar result were also reported by Shinde *et al.* (2008) [3] and Momin *et al.* (2016) [2] in mango. Triacontanol increases chlorophyll content, photosynthesis rate, transpiration, stomatal conductance and uptake of nutrients in leaves hence fruit length, breadth, weight, volume, yield per plant increased in mango.

**Table 1:** Effect of plant growth regulators and chemicals on fruit setting and yield of mango

Treatment no.	Treatment details	Days taken from fruit set to harvest	Fruit retention at harvesting stage (%)	Length of fruit (cm)	Breadth of fruit (cm)	Weight of fruit (cm)	Volume of fruit (cc)	Number of fruits/plant at harvest	Fruit set (%)		Fruit drop (%)	Yield / plant (kg)	Yield (t/ha)
									Pea stage	Marble stage			
T1	GA3 35 ppm	101.33	0.91	10.46	7.04	265.67	159.00	77.67	13.89	7.23	87.42	20.63	10.31
T2	CPPU 5 ppm	109.00	0.44	9.70	6.21	254.33	146.00	59.00	11.52	5.89	92.59	15.00	7.50
T3	CPPU 10 ppm	103.33	0.76	10.11	6.84	261.33	153.67	72.33	13.02	6.78	89.48	18.90	9.45
T4	Triacontanol 750 mg/L	99.00	1.00	11.58	7.09	270.00	164.93	87.67	14.17	7.52	86.66	23.67	11.83
T5	NAA 50 ppm	100.33	0.98	11.23	7.06	267.00	162.33	84.67	14.02	7.44	86.79	22.61	11.30
T6	NAA 25 ppm + ZnSO <sub>4</sub> 0.5%	105.67	0.61	9.96	6.73	259.67	150.00	69.00	12.81	6.45	90.49	17.92	8.96
T7	NAA 25 ppm + FeSO <sub>4</sub> 0.5%	107.67	0.51	9.81	6.44	257.67	149.33	63.00	12.11	6.30	91.9	16.24	8.12
T8	NAA 25 ppm + Borax 0.2%	102.00	0.83	10.29	7.00	263.33	155.00	74.67	13.34	6.91	88.04	19.66	9.83
T9	Control (No treatment)	114.00	0.25	8.97	6.03	251.00	141.33	50.33	10.73	5.19	95.18	12.63	6.32
	S.E <sub>±</sub>	0.67	0.005	0.08	0.02	1.2	1.63	1.17	0.01	0.01	0.06	0.29	0.15
	CD at 5%	2.01	0.014	0.25	0.04	3.63	4.92	3.51	0.03	0.03	0.19	0.88	0.44

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