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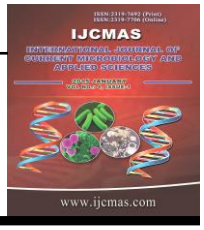

Original Research Article

Studies on Post Harvest Treatments on Ripening and Shelf Life of Mango (*Mangifera indica*) cv. Kesar

G. Jyothi* and K. M. Yuvaraj

Department of Horticulture, S.V. Agricultural College, Tirupati, India

**Corresponding author*

Keywords

Kesar mangoes, -GA3 - Gibberellic acid, Ethrel , CCC - Cycocel, 2,4 -D - 2, 4 Dichlorophenoxy acetic acid. MH - Malic hydrazide, Bavistin

A B S T R A C T

Freshly harvested fruits of uniform size, shape, color and maturity were selected and were washed with tap water and surface dried. Ten fruits were analysed per treatment. The treatments consists of T1 -GA_3 200 ppm, T2 - Ethrel 400 ppm. T3 - CCC 400 ppm, T4 - 2,4 -D 40 ppm, T5 - MH 1000ppm, T6 - Bavistin - 1000ppm and T7 - Control. The highest percentage of marketable fruits (78.75) on 15 th day of storage was observed in the fruits treated with Bavistin 1000ppm followed by 2,4 -D 40 ppm (73.75) and lowest spoilage (21.25) was recorded in fruits treated with Bavistin 1000 ppm followed by 2,4 - D, 40 ppm (26.25). The treatment 2,4 - D and GA3 was found to significantly minimize the rate of increase in TSS content in the fruits as compared to control during the storage period. During storage period, acidity of fruits showed conntinues decrease until the last day of storage and such rapid decline may be due to faster utilization of acids in the process of respiration.

Introduction

The surplus production of mango from the orchards leads to glut in the market there by there will be reduction in market prices which causes huge loss economically to the growers. As the fruits are perishable at ambient temperature where in they continues respiration and transpiration process even after detachment from the mother plant, it is not possible to transport to distant market with out spoilage. The present study was under taken to investigate the ripening changes and extending the shelf life of mango fruits with various post harvest treatments so as to transport them to the distant markets in fresh condition.

Materials and Methods

The Experiment was carried out at S.V Agricultural college, Tirupati under laboratory conditions during the year 2001 - 2002 and was laid out in a factorial Randomized Block design with seven treatments and three replications. Freshly harvested fruits of uniform size, shape, color and maturity were selected and were washed

with tap water and surface dried. Ten fruits were analysed per treatment. The fruits were dipped in the respective chemical solutions for ten minutes and dried under shade for 30 minutes. The treated fruits were packed in card board carton boxes using news paper as lining material and stored under laboratory conditions.

Treatments

T1 -GA3 200 ppm. T5 - MH 1000ppm

T2 - Ethrel 400 ppm. T6 - Bavistin - 1000ppm.

T3 - CCC 400 ppm. T7 - Control.

T4 - 2,4 -D 40 ppm.

Observation of fruits for various parameters was recorded at respective 5 days interval. Physiological loss in weight (PLW%) was determined by recording the initial weight of fruits prior to packing and subsequently at 5 days intervals. The reduction in weight was expressed on percentage basis. For marketable fruits, the number of visibly sound fruits that can be marketed were counted and expressed as percentage over the total number of fruits at specific interval. Similarly, for spoilage percentage, the number of visibly diseased, over ripe fruits was counted and expressed as percentage over the total number of fruits at specific intervals. Total soluble solids, asccorbic acid and Total sugar content were assessed.

Results and Discussion

The results of percentage marketable fruits which are influenced by various post harvest treatments were presented in the table 1.

On the 15th day of storage, the highest percentage of marketable fruits (78.75) was observed in the fruits treated with Bavistin 1000 ppm followed by 2,4 - D 40 ppm (73.75). This may be due to treatment effect with retarded ripening and reduced the weight loss through controlled transpiration and respiration rates and also prevent the micro organisms infection. Similar findings were reported by parmer (1982) in mango and patel *et al.,* (1994) in guava. On 15th day of storage, lowest spoilage (21.25) was recorded in fruits treated with Bavistin 1000 ppm followed by 2,4 - D, 40 ppm (26.25) and the remaining treatments also gave promising results to reduce the spoilage of fruits. This may be due to slow ripening process through production in transpiration and metabolic activity.

Bavistin is a systemic fungicide it persists in the long period in the peel tissues of fruits and also prevents the entry of micro organisms. Similar findings were reported by Parmar (1982) and Omprakash (1993) i mango with Bavistin, Patel *et al.,* (1994) in guava with 2,4 - D. The treatment 2,4 - D and GA3 was found to significantly minimize the rate of increase in TSS content in the fruits as compared to control during the storage period. This might be due to retarded respiration and oxidation rate with higher gaseous diffusion of fruits.

The present investigation showed that the TSS accumulation was low in case of treated fruits as compared to untreated fruits. This is in confirmation with the results reported by Dashora *et al.,* (1988) in sweet orange. During storage period, acidity of fruits showed continues decrease until the last day of storage. Such rapid decline may be due to faster utilization of acids in the process of respiration. These results are in agreement with Avaiya and Singh (1991) in Sapota fruits with GA3 application and reported that it may be attributed to its high utilization in respiration during ripening in the presence of reduced sugar supply as a substrate of respiration due to treatments.

Table.1 Effect of Post harvest treatment treatments on physiological weight loss (%) and marketable fruit (%)

S.no	Treatments	PLW (%) Storage period (days)			Marketable fruit (%) Storage period (days)		
		5	10	15	5	10	15
1.	GA_3 200 ppm	10.10	16.23	19.51	100.00	86.25	71.25
2.	Ethrel 400 ppm	11.16	17.62	20.09	100.00	71.25	61.25
3.	CCC 400 ppm	10.69	17.12	20.51	100.00	77.50	63.75
4.	2, 4- D 40 ppm	9.56	15.11	19.06	100.00	90.00	73.75
5.	MH 1000 ppm	10.25	16.88	20.05	100.00	82.50	66.25
6.	Bavistin 1000ppm	10.41	16.40	20.32	100.00	92.50	78.75
7.	Control	11.70	18.83	22.08	100.00	66.25	58.75
	S.Em +/-	0.22	0.31	0.14	2.34	2.81	3.88
	C.D at 5%	0.62	0.86	0.40	-	8.02	11.06

Table.2 Effect of Post harvest treatment treatments on spoilage fruit (%) of Kesar mangoes during storage.

S.no	Treatments	Spoilage (%) Storage period (days)		
		5	10	15
1.	GA_3 200 ppm	0.00	13.75	28.75
2.	Ethrel 400 ppm	0.00	28.75	38.75
3.	CCC 400 ppm	0.00	22.50	36.25
4.	2, 4- D 40 ppm	0.00	10.00	26.25
5.	MH 1000 ppm	0.00	17.50	33.75
6.	Bavistin 1000ppm	0.00	7.5	21.25
7.	Control	0.00	33.75	41.25
	S.Em +/-	2.34	2.74	3.05
	C.D at 5%	-	7.84	8.73

Table.3 Effect of post harvest treatments on TSS (%) and acidity (%) of Kesar mangoes during storage.

S.no	Treatments	TSS (%) Storage period (days)			Acidity (%) Storage period (days)		
		5	10	15	5	10	15
1.	GA_3 200 ppm	14.16	15.46	16.48	0.68	0.42	0.30
2.	Ethrel 400 ppm	14.62	16.18	16.97	0.56	0.37	0.21
3.	CCC 400 ppm	14.45	15.97	16.92	0.64	0.37	0.21
4.	2, 4- D 40 ppm	14.05	14.48	15.30	0.68	0.44	0.31
5.	MH 1000 ppm	14.22	15.52	16.67	0.66	0.41	0.24
6.	Bavistin 1000ppm	14.38	15.85	16.67	0.64	0.40	0.23
7.	Control	14.96	16.36	17.10	0.62	0.32	0.20
	S.Em +/-	0.05	0.05	0.07	0.05	0.06	0.03
	C.D at 5%	-	0.14	0.21	NS	0.01	NS

Table.4 Effect of post harvest treatments on Ascorbic acid (mg/100 g pulp) and Total sugar (%) of Kesar mangoes during storage.

S.no	Treatments	Ascorbic acid (mg/100 g pulp) Storage period (days)			Total sugar (%) Storage period (days)		
		5	10	15	5	10	15
1.	GA_3 200 ppm	17.80	14.25	11.60	12.95	14.17	15.07
2.	Ethrel 400 ppm	16.41	13.47	9.83	12.34	13.64	14.18
3.	CCC 400 ppm	16.64	13.49	7.26	12.49	13.74	14.29
4.	2, 4- D 40 ppm	20.47	15.97	12.58	13.16	14.30	15.18
5.	MH 1000 ppm	16.79	14.26	10.85	12.51	13.77	14.84
6.	Bavistin 1000ppm	19.42	14.66	11.96	12.58	13.93	14.76
7.	Control	16.19	13.25	9.78	11.93	13.05	13.76
	S.Em +/-	0.06	0.03	0.06	0.03	0.03	0.04
	C.D at 5%	0.19	NS	NS	NS	0.11	0.12

The highest percentage of marketable fruits (78.75) on 15th day of storage was observed in the fruits treated with Bavistin 1000ppm followed by 2,4 -D 40 ppm (73.75) and lowest spoilage (21.25) was recorded in fruits treated with Bavistin 1000 ppm followed by 2,4 - D, 40 ppm (26.25). The treatment 2,4 - D and GA3 was found to significantly minimize the rate of increase in TSS content in the fruits as compared to control during the storage period. During storage period, acidity of fruits showed continues decrease until the last day of storage and such rapid decline may be due to faster utilization of acids in the process of respiration.

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