

Effect of post-harvest application of wax-emulsion and gibberellic acid on the physical characters of kinnow mandarin fruits during storage

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Abstract :

An experiment was conducted at Department of Horticulture, R.B.S.College Agra, U.P, during 1998, on effect of post-harvest application of wax-emulsion and Gibberellic acid on Kinnow mandarin during storage conducted to test the suitability of concentrations of wax and GA each at 3,6,9,12 percent and 100,200,300 ppm, respectively. The application of 9 to 12 percent wax-emulsion with 200 ppm GA could stored Kinnow mandarin fruits for a longer period at room temperature with minimum deterioration in quality was found the best treatment for the post-harvest application during storage of Kinnow mandarin under reference.

Key words: Wax-emulsion, Gibberellic acid, Kinnow mandarin

1 Introduction:

Fruits and vegetables are an important supplement to the human diet as they provide the essential minerals, vitamins and fibre required for maintaining health. However, for various reasons, this abundance of production is not fully utilized and about 25-30% of it may be wasted due to spoilage. Most of fruits and vegetables are seasonal and perishable in nature. Moreover, the surplus often can not be stored for sale in off-season because of shortage in local cold storage facilities. Thus, through this research, most important post-harvest aspects, is the storage of Kinnow fruits to an extended period without any deterioration unlike under common (Room) storage will be covered.

Fruits treated with 12 percent wax-emulsion alone as well as in combination of GA 200 ppm or 300 ppm showed the significant retention of peel thickness over control at the 28th days of storage. These experimental findings were confirmation with the observation of Mann and Randhawa (1978).

Juice Content:-

The juice content of the fruit showed a decline with the advancement of storage at the 28th day of observation. The maximum juice content was retained towards higher concentration of wax-emulsion and 200 ppm GA treated fruits as compared to control. Similar results were recorded by Jawanda et al, (1978) and Josan et al, (1983).

Spoilage Percentage

The spoilage of fruits in the storage was significantly affected by the treatment of wax-emulsion 12 percent, GA 200 ppm and their combination (wax 9% and GA 200 ppm) at the 28th day of storage at room temperature. These findings from the present investigation hold good results with similar observations reported by various workers in Naval-oranges (Coggins, 1968) and Guavaa (Saha. 1971).

Ripening

In the present study Gibberellic acid could have recorded the biochemical changes indirectly by

opposing the production of Ethylene i.e. like wise it involved in retarding storage (Dilley, 1969) and Mango (Khader, 1989).

2 Methodology:

The experiment was carried out in the Department of Horticulture, R.B.S.College Agra. The experiment was laid out in completely randomized design with Twenty (20) treatments and Three replications. Ten matured fruits per sample were used for experimentation, and kept at room temperature ranged from 8.1 to 29 C.

After initial physical analysis, the fruits were treated with different concentrations of wax-emulsion i.e. 3,6,9 and 12 percent and Gibberellic acid i.e. 100,200 and 300 ppm along with their possible combinations. The fruits were dipped in the respective solutions for two minutes, and packed in polythene bags of 60 X 45 cm size of 200 gauge thickness having perforation on three percent area.

The observations were taken at an interval of Seven days for a period of 28 days considering physical changes i.e. Loss of weight, peel thickness, fruit rotting, change in colour and taste, fruit-diameter, juice content etc.

TABLE

Effect of different concentrations of wax-emulsion and Gibberellic acid on weight loss, peel thickness, juice content, rotting percentage and ripening at 28th day of storage

S. No.	Treatments		Wt. Loss (%)	Peel - Thickness (Cm)	Diameter (Cm)	Rotting (%)
1.	W. E. 0%	+GA0 00ppm	39.62	0.419	13.64	85.26
2.	W. E. 0%	+GA1 00ppm	38.98	0.420	13.61	62.45
3.	W. E. 0%	+GA2 00ppm	38.29	0.420	13.61	79.79
4.	W. E.	+GA3 00ppm	37.53	0.421	13.60	80.07

5.	W. E. 3%	+GA0 00ppm	24.79	0.421	13.58	80.01
6.	W. E. 3%	+GA1 00ppm	24.76	0.422	13.58	77.91
7.	W. E. 3%	+GA2 00ppm	23.92	0.424	13.56	77.00
8.	W. E. 3%	+GA3 00ppm	23.92	0.423	13.58	77.09
9.	W. E. 6%	+GA0 00ppm	20.18	0.424	13.55	73.69
10.	W. E. 6%	+GA1 00ppm	20.01	0.425	13.55	72.14
11.	W. E. 6%	+GA2 00ppm	20.11	0.427	13.55	70.44
12.	W. E. 6%	+GA3 00ppm	19.79	0.427	13.55	71.17
13.	W. E. 9%	+GA0 00ppm	18.76	0.428	13.56	68.01
14.	W. E. 9%	+GA1 00ppm	18.21	0.429	13.54	66.78
15.	W. E. 9%	+GA2 00ppm	17.97	0.429	13.53	54.62
16.	W. E. 9%	+GA3 00ppm	18.03	0.430	13.52	58.09
17.	W. E. 12%	+GA0 00ppm	19.69	0.429	13.50	59.66
18.	W. E. 12%	+GA1 00ppm	19.42	0.430	13.50	58.09
19.	W. E. 12%	+GA2 00ppm	17.89	0.431	13.49	54.99
20.	W. E. 12%	+GA3 00ppm	18.08	0.431	13.49	56.07

S.Em. +	0.39	0.002
0.15 0.65		
CD at 1%	1.49	0.008
0.57 2.46		

Effects of different concentrations of wax-emulsion and Gibberellic acid on weight loss peel thickness, juice content, rotting percentage and ripening at 28th day of storage.

3 Result and Discussion:

Loss of Weight:

In kinnow mandarins, application of 12 percent wax-emulsion along with GA 200 ppm concentration proved to be most effective for reducing the physiological loss in weight (17.89%) against control (36.62%) at the 28th day of storage period. Increasing the thickness of wax-emulsion coating (concentrations) reduced the weight loss to a greater extent as compared to control. Similar results were also reported in Kinnow mandarin (Singh et al., 1986) and Mango (Khader, 1989).

Peel Thickness and Diameter

It is evident from the study that there was a slow and consistent reduction in both the peel thickness and the diameter of Kinnow mandarin fruits, during storage along with wax-emulsion, Gibberellic-acid and their combinations.

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