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RESEARCH PAPER

Effect of pre-harvest sprays and post-harvest dip of different chemicals on shelf-life of guava

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Abstract **:** A study was carried out to find out the effect of pre and post harvest applications of different chemicals on shelf life of guava fruits during storage. The data showed that the pre-harvest spray of 2.0 per cent calcium nitrate solution and post harvest dip in 2.0 per cent calcium nitrate solution (A_2B_3) recorded highest shelf life of guava fruits followed by pre-harvest spray of 2.0 per cent starch (potato) solution and post-harvest dip in 2.0 per cent calcium nitrate solution (A_3B_3). The lowest values of shelf life of guava fruit were recorded with pre-harvest spray of distilled water and post-harvest dip in any treatments.

Key Words **:** Guava, Shelf-life, Pre- harvest spray, Post-harvest dip

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INTRODUCTION

Guava (*Psidium guajava* L.) is one of the most important, highly productive, delicious and nutritious fruit gown commercially throughout tropical and subtropical region of India. In India guava is cultivated in an area of 0.16 million hectares with an annual production of 1.6 million tones and accounting for 5.26 per cent and 3.73 per cent of area and production, respectively. It occupies fifth position in terms of area and fourth position in terms of production among fruits of India. In M.P. the area under guava fruit is 4800 ha and production is about 95,000 MT (NHB, 2009). Though, successfully grown all over the country, Uttar Pradesh, Bihar, and Madhya Pradesh are the largest growers and produces best quality guava. Allahabad has the distinct reputation of growing best quality guavas in the world.

It is climacteric fruit and highly perishable in nature and should be marketed immediately after harvest, it can only be stored up to 2 to 3 days under ambient conditions. In order to minimize these losses and to increase the keeping quality, the study was carried out to evaluate the efficacy of different chemicals on shelf life of guava.

MATERIALS AND METHODS

The present investigation of pre and post harvest application of different chemicals effect on shelf life of selected variety guava fruits (*Psidium guajava* L.) was conducted during January 2007 to April 2008. The treatments consisted of 20 combinations of pre-harvest spray (5 levels) and post-harvest dip (4 levels) comprising three replications were tested under factorial RBD.

Single spray of calcium compounds, starch and copper oxychloride were carried out one month before harvesting in the first year on 10th December 2007 and in the second year on 2nd December 2008 with the help of foot sprayers using 0.1 per cent teepol as surfactant. The control trees were sprayed with water. The fruits were handled for sampling 30 days after spraying the chemicals (Bhanja and Lenka, 1994). As a post harvest dip, the harvested fruits were taken one month after the pre-harvest spray of fruits and were dipped for 2 minutes in chemicals dissolved in water as per the treatment.

RESULTS AND DISCUSSION

The data on shelf life of guava fruit after 9 days of storage were statistically analyzed year-wise separately and as average

both and values are presented in Table 1a, Table 1b and Table 1c and depicted in Fig. 1a, 1b and 1c.

Highest shelf life of guava (7.69, 7.84 and 7.76 in 2007, 2008 and average, respectively) was recorded under pre-harvest spray of 2.0 calcium nitrate solution followed by pre-harvest spray of 2.0 per cent starch (potato) solution (7.13, 7.30 and 7.22 % in 2007, 2008 and average, respectively). However, lowest shelf life of guava fruit was observed under pre-harvest spray of distilled water during both the years and its average value. There was no significant difference between pre-harvest spray of 2.0 calcium chloride solutions and pre-harvest spray of copper oxychloride solution – 5000 ppm during both the years.

Data revealed that the treatments under post-harvest dip significantly influenced the shelf life of guava fruit during both the years. The highest shelf life of guava fruit (7.44, 7.58 and 7.51 days in 2007, 2008 and average, respectively) was observed under 2.0 per cent calcium nitrate solution. The lowest shelf life of guava fruit was recorded with post-harvest dip in distilled water (5.68, 5.84 and 5.76 days in 2007, 2008 and average, respectively) followed by post-harvest dip in copper oxychloride – 1000 ppm solution during both the years. There was no significant difference between post-harvest dip in copper oxychloride -1000 ppm and 2.0 per cent calcium chloride solution.

The data showed that the pre-harvest spray of 2.0 per cent calcium nitrate solution and post harvest dip in 2.0 per cent calcium nitrate solution (A_2B_3) recorded highest shelf life of guava fruits followed by pre-harvest spray of 2.0 per cent starch (potato) solution and post-harvest dip in 2.0 per cent calcium nitrate solution (A_3B_3). The lowest values of shelf life of guava fruit were recorded with pre-harvest spray of

Table 1a : Effect of pre-harvest spray on shelf life of guava fruit after 9 days of storage

Treatments	After 9 days storage		
	2007	2008	Average
A_0	5.27	5.43	5.35
A_1	6.25	6.40	6.33
A_2	7.69	7.84	7.76
A_3	7.13	7.30	7.22
A_4	6.44	6.60	6.52
S.E.±	0.14	0.14	0.14
C.D. (P=0.05)	0.29	0.29	0.29

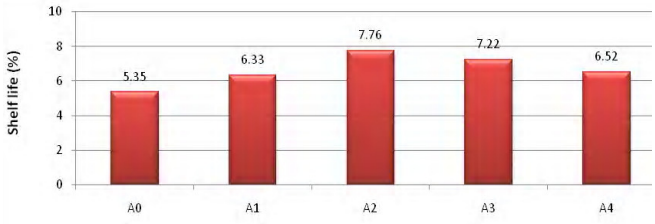

Fig. 1a : Effect of pre-harvest spray on shelf-life (days) in fruits

Table 1b : Effect post- harvest dip on rotting of guava fruit after 9 days of storage (days)

Treatments	After 9 days storage		
	2007	2008	Average
B_1	5.68	5.84	5.76
B_2	6.60	6.77	6.69
B_3	7.44	7.58	7.51
B_4	6.51	6.67	6.59
S.E.±	0.13	0.13	0.13
C.D. (P=0.05)	0.26	0.26	0.26

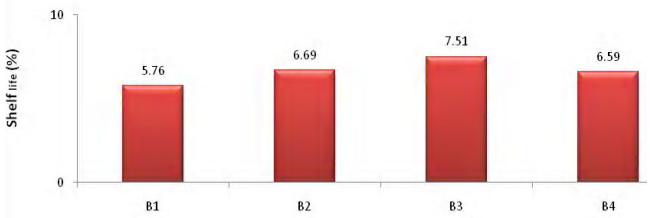

Fig. 1b : Effect of post-harvest dip on shelf life (days) in fruits

Table 1c : Effect of interaction between pre-harvest spray and post harvest dip on shelf life of guava fruit after 9 days of storage (days)

Treatments	2007				2008				Average			
	B_1	B_2	B_3	B_4	B_1	B_2	B_3	B_4	B_1	B_2	B_3	B_4
After 9 days storage												
A_0	4.39	4.99	5.84	5.86	4.56	5.17	5.98	6.02	4.47	5.08	5.91	5.94
A_1	6.01	6.15	6.58	6.26	6.16	6.31	6.72	6.41	6.09	6.23	6.65	6.34
A_2	6.81	7.37	9.22	7.34	6.93	7.55	9.37	7.49	6.87	7.46	9.30	7.42
A_3	6.25	7.40	8.32	6.56	6.42	7.59	8.48	6.73	6.33	7.49	8.40	6.64
A_4	4.96	7.08	7.22	6.51	5.13	7.25	7.36	6.67	5.05	7.16	7.29	6.59
S.E.±	0.29				0.29				0.29			
C.D. (P=0.05)	0.59				0.58				0.58			

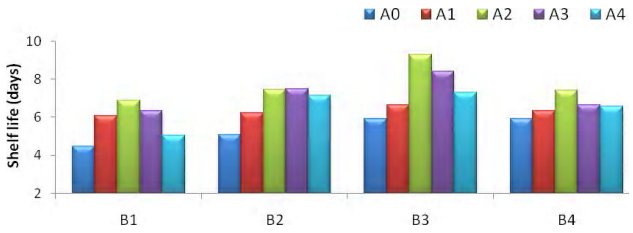

Fig. 1c : Effect of interaction between pre-harvest spray and post harvest dip on shelf life of guava fruit after 9 days of storage (days)

distilled water and post-harvest dip in any treatments.

The interaction between pre- harvest spray and post harvest of dip calcium nitrate was found superior to calcium chloride, starch (potato) and copper oxychloride and maintained higher shelf life of guava fruits during storage period. Pre-harvest spray of calcium compounds recorded maximum shelf life of guava fruits compared to post-harvest dip of calcium chloride, starch (potato) and copper oxychloride treatment. Calcium is relatively divalent cation that readily enters the apoplastic and is bound in exchangeable form to cell wall and exterior surface of plasma membrane. Non-toxic even at high concentration, it serves as a detoxifying agent, tying up toxic compounds and maintaining the cation-anion balance in the vacuole. In the cell walls calcium serves as a binding agent in the of calcium pectates. Calcium had received considerable attention in the recent past due to its desirable effect. Particularly it can delay ripening and senescence, increases firmness, vitamin C and phenolic contents, reduces respiration, extends storage life and reduces the incidence of physiological disorders and storage rottage. Similar results were reported by Rajput *et al.* (2008) and Mahaisen (2005) in guava.

REFERENCES

Mehaisen, S.M.A. (2005). Effect of spray with calcium and some post-harvest treatments on fruit quality and storability of guava fruits. *Ann. Agric. Sci., Moshtohor,* **43** (1): 327 – 339.

Rajput, B.S., Lekhi, R., Sharma, G. and Singh, I. (2008). Effect of pre and post harvest treatments on shelf life and quality of guava fruits (*Psidium guajava* L.) cv. GWALIOR-27. *Asian J. Hort.,* **3** (2) : 368 – 371.

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