Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 06, pp. 16773-16775, June 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

EFFECT OF PRE AND POST TREATMENTS AND STORAGE DURATIONS ON VASE LIFE OF POLYPROPYLENE PACKED CUT ROSE VAR. PASSION

Makwana, R. J., *Alka Singh, Neelima Palagani and Sumathi Tatte

Department of Floriculture and Landscape Architecture ASPEE College of Horticulture and Forestry, NAU, Navsari 396 450, Gujarat, India

ARTICLE INFO

Article History:
Received 05th March, 2015
Received in revised form
18th April, 2015
Accepted 23rd May, 2015
Published online 27th June, 2015

Key words:

Rose, Polypropylene, Cold storage, Storage durations, Bent neck, vase life.

ABSTRACT

A study was conducted to find out the effect of pre and post storage treatments on polypropylene sealed packed cut roses with different cold storage (2°) durations *viz.,* 5, 10, 15, 20, 25 and 30 days. PP packed flowers treated with pre and post storage vase solution consisting of 5% sucrose + 8 HQC 300 mg/l + α-lipoic acid 200 mg/l, cold stored up to 20 days showed promising results with maintained flower quality. In general the trend showed decrease in water uptake, foliage intactness and vase life as well as higher bent neck with increase in storage duration. However, the treatment of pre and post storage showed maintained foliage intactness, higher water uptake, low bent neck with vase life of 6.69 days in cut roses stored up to 20 days. Whereas the flowers stored up to 15 days without any pre and post storage treatment with PP sealed packing maintained quality with vase life of 5.62 days.

Citation**:** Makwana R.J., Alka Singh, Neelima Palagani and Sumathi Tatte, 2015. "Effect of pre and post treatments and storage durations on vase life of polypropylene packed cut Rose var. passion", *International Journal of Current Research,* 7, (6), 16773-16775.

INTRODUCTION

Rose is one of the nature's beautiful creations and is universally known as the "Queen of Flowers". As they are most popular cut flowers in the world, the demand of cut roses often reaches its peak followed by high prices during festival times while on other hand faces the problem of price crash during market gluts. However, long distance transportation of roses via sea shipment is further restricted due its limited vase life, deterioration in flower quality (Mor *et al*., 1989, van Doorn and d' Hont, 1994) and chilling injury (Pompodakis *et al*., 2010) at low temperature storage. Storage of cut flowers using polypropylene seal packaging has been reported to efficiently maintain flower quality in low temperate stored flowers (Makwana *et al*., 2015, Singh *et al*., 2007). Storage temperature and duration along with holding solution treatments effectively influence metabolic activities of cut flower (Halevy and Mayak 1981). Post harvest treatments constituting germicides and sugar are used to improve flower quality and longevity of cut flowers. Antioxidants like α-lipoic acid, sodium benzoate, etc. have been reported to enhance vase life of cut flowers by their action on quenching free radicals (Singh *et al.,* 2005).

****Corresponding author: Alka Singh,***
Department of Floriculture and Landscape Architecture ASPEE College of Horticulture and Forestry, NAU, Navsari 396 450, Gujarat, India.

Hence, this experiment was planned to study the effect of pre and post storage treatment comprising of sugars (sucrose), germicide (8 HQC) and antioxidant (α-lipoic acid) and further to evaluate proper storage duration for rose cut flower that would aid in the development of market strategy and accessibility at international market.

MATERIALS AND METHODS

Experiment was carried out in Floriculture Research Laboratory, Department of Floriculture and Landscaping, ASPEE College of Horticulture and Forestry, NAU, Navsari. The cut flowers of rose var. Passion were obtained from commercial greenhouse near Navsari. The experiment was laid out in completely randomized design with Factorial concept with three repetitions. There are fourteen treatment combinations consisting of two factors. One factor as storage durations consisted of 7 durations fresh flowers (D_0), 5 days (D_1), 10 days (D_2), 15 days (D_3), 20 days (D_4), 25 days (D_5) and 30 days(D_6) and the second as fresh water (P_0) and pre and post storage treatments comprising of 5% sucrose + 8 HQC 300 mg/l + α-lipoic acid 200 mg/l (P_1). Flowers of uniform bud size were harvested early in the morning. Half of the flowers were subjected to treatment consisting of (P_1) for 3 h, whereas remaining half was held in water (P_0) for the same time. All the flowers were then divided in to 3 bunches each of 10 flowers and packed in polypropylene and kept in cold storage at 2°C for duration of 30 days. Again after 5 days, similar procedure was followed 5 times for freshly harvested cut flowers at an interval of 5 days up to 25 days. Thus, 30 days after storage, all the flowers were taken from the cold storage, brought to the lab and unpacked. The unpacked flowers were recut (2-3cm) from the basal end. All the pre-stored treated bunches were held in solution comprising of 5% sucrose + 8 HQC 300 mgL^{-1} + 200 mgL^{-1} α-lipoic acid (P1), while, the bunches which were not given pre storage treatment were held in water. At the same time another six bunches (10 flowers per bunch) of freshly harvested cut flowers were brought in the lab and half of them were held in the solution of P_1 and the remaining bunches were placed in distilled water (P_0). Observations on post harvest parameters like physiological loss in weight (%) and foliage intactness (%) were taken on just after storage and water uptake (ml) and bent neck (^{o}) were taken on 2nd, 4th and 6th day after storage of vase life respectively.

RESULTS AND DISCUSSION

Data depicted in the Table 1 revealed that minimum physiological loss in weight was recorded in P_1D_1 (0.62 %) which was at par with P_1D_2, P_1D_3 and P_1D_4 (0.67%, 0.69% and 0.74% respectively) and it was maximum (1.46%) in P_0D_6. There was decrease in foliage intactness with increasing storage duration. increase in storage duration, a decrease in water uptake and increase in percent of bent neck was observed (Table. 2). Maximum water uptake was observed in treated 5 days cold stored (2°C) PP packed cut flowers, P_1D_1 (102.80 ml) which was at par with P_1D_2 and P_1D_3, (101.60 and 100.30 ml) on 2nd DAS. At 4th and 6th DAS maximum water uptake was recorded by treated fresh flowersP_1D_0 (60.80 and 49.60 ml) which was at par with all the treated and cut flowers stored at different durations.

In the similar way treated cut flowers P_1D_1 (4.89 and 13.67°) recorded significantly decreased bent neck which was at par with treated and stored flowers at different durations (P_1D_1-P_1D_6) compared to untreated cut flowers (P_0D_0- P_0D_6) on 4th and 6th DAS. Increase in water uptake and decrease in bent neck in pre-storage pulsed and post-storage vase solution treated cut roses var. Passion can be attributed to strong antimicrobial activity of 8-HQC (Marousky, 1971) that is known to restrict the growth of microorganisms in the solution and eliminate vascular occlusion in xylem (Burdett, 1970). Further, role of sucrose in influencing osmotic potential of petal cell and maintaining of better balance in flowers is well known (Borochov *et al.,* 1976 and Ichimura and Haraya*,* 1999). Maximum vase life (6.94 days) was observed in fresh flowers which were at par with treated PP packed cold stored flowers up to 20 days *i.e.,*P_1D_1 (6.89 days), P_1D_2 (6.83 days),

Table 1. Effect of storage duration with pre storage pulsing and post storage vase solution on quantitative parameters of rose var. Passion

Storage duration	Pre storage pulsing and post storage vase solution					
	PLW (%)		Foliage intactness		Vase life	
JAS	P0	P1	P0	P1	P0	P1
D_0 (fresh flowers)	-	-	100.00	100.00	5.80	6.94
D_1 (5 days)	1.28	0.62	100.00	100.00	5.72	6.89
D_2 (10 days)	1.31	0.67	100.00	100.00	5.68	6.83
D_3 (15 days)	1.32	0.69	100.00	100.00	5.62	6.78
D_4 (20 days)	1.37	0.74	94.68	100.00	5.49	6.69
D_5 (25 days)	1.42	0.86	68.23	82.56	3.76	4.87
D_6 (30 days)	1.46	0.94	59.43	67.38	3.07	4.13
CD (P×D)at 5%	0.19		4.08		0.44	

Table 2. Effect of storage duration with pre storage pulsing and post storage vase solution on quality parameters of rose var. Passion

Storage duration	Pre storage pulsing and post storage vase solution									
	Water uptake						Bent neck			
	2nd		4th		6th		4th		6th	
DAS	P0	P1	P0	P1	P0	P1	P0	P1	P0	P1
D_0 (fresh flowers)	89.70	97.90	55.80	60.80	45.40	49.60	6.83	4.89	24.48	13.67
D_1 (5 days)	94.50	102.80	55.60	60.60	45.30	49.40	6.92	4.96	24.52	13.72
D_2 (10 days)	92.50	101.60	55.10	60.40	44.80	49.20	6.97	4.98	24.56	13.78
D_3 (15 days)	92.10	100.30	54.70	59.70	44.60	48.60	7.03	5.03	24.59	13.81
D_4 (20 days)	90.20	97.90	54.20	58.90	41.90	46.80	7.08	5.06	24.61	13.86
D_5 (25 days)	89.60	97.40	53.80	58.20	41.40	46.60	7.12	5.09	24.64	13.91
D_6 (30 days)	88.40	95.60	52.80	57.60	40.20	46.50	7.16	5.13	24.68	13.97
CD (P×D)at 5%	3.82		3.36		3.51		0.44		0.44	

Foliage intactness was maintained (100%) upto 15 days and declined there after (94.68 %) in untreated flowers (P_o) and after 20 days (82.56 %) in treated flowers (P_1). Sucrose with α-lipoic acid being antioxidant would have played protective role in maintaining cell membrane integrity and stability in cut roses during storage duration and thus contributed in decreased PLW% and maximum foliage intactness during storage. With P_1D_3 (6.78 days) and P_1D_4 (6.69 days) compared to untreated cut flowers, (P_0D_0-P_0D_4) 5.80-5.49 days in PP packaged cold stored (2°C) cut roses. Increased longevity of pre and post storage treated cut roses can be attributed to continued and increased water uptake in the cut flowers, low PLW and decreased bent neck. Use of antioxidants in retaining membrane integrity and for anti senescence effects during aging has been reported in gladiolus (Singh, 2005) and tuberose (Sahare *et al.,* 2015). Thus, α-lipoic acid, being antioxidant in vase solution also aided in delaying senescence and enhanced the vase life.

REFERENCES

Borochov, A. Tirosh, T. and Halevy, A. H. 1976. Abscissic acid content of senescing petals of cut rose flowers as affected by sucrose and water stress. *Plant Physiology*, 58: 175-178.

Burdett, A. N. 1970. The cause of bent neck in cut roses. *J. American. Soc. Hort. Sci*., 95: 427-431.

Halevy, A.H. and Mayak, S. 1981. Senescence and post harvest physiology of cut flowers. Part II. *Hort. Rev*., 3:59-143.

Ichimura, K. and Haraya, T. 1999. Effect of silver-thio complex (STS) in combination with sucrose on the vase life of cut sweet pea flowers. *J. Japan. Soc. Hort. Sci.,* 68: 23-27.

Makwana, R. J., Singh, A. and Neelima, P. 2015. Effect of cold storage duration techniques on flower quality and vase life of rose var. Sunking. *Bioscan.*, 10(1): 225-227.

Marousky, F. J. 1971. Inhibition of vascular blockage and increased moisture retention in cut roses induced by pH, 8-Hydroxyquinoline citrate and sucrose. *J.Amer. Soc. Hort. Sci*., 96(1): 38-41.

Mor, Y.F., Johnson, S. and Faragher, J.D. 1989. Long term storage of roses. *Acta Horticulturae,* 261: 271-279.

Pompodakis, N. E., Terry, L. A., Joyce, D. C., Papadimitriou, M. D., Lydakis, D.E. and Darras, A.I. 2010. Effects of storage temperature and abscisic acid treatment on the vase-life of cut 'First Red' and 'Akito' roses. *J. Hort. Sci. Biotech.*, 85:253-259.

Sahare, H. A., Singh, A., Sachin, C., Chawla,S. L. and Bhanderi, D. R. 2015. Post storage physiology and vase life of low temperature stored tuberose cut spikes as influenced by α-Lipoic acid and polyfilm packaging. *Asian J. Biol. Life Sci.,* 4(1):29-33.

Sing, V. P. 2005. Deterioration of membrane during flower senescence in gladiolus and its amelioration with free radical scavenger. *J. Ornam. Hort.*, 8(1): 8-12.

Singh, A., Dhaduk, B. K. and Desai, J. R. 2007. Post harvest Technology and Value Addition in Cut Flowers. *Floriculture Today*, 12(4): 40-46.

Singh, A., Kumar, J. and Kumar, P. 2005. Influence of 8-Hydroxy quinoline (8-HQ) and sucrose pulsing on membrane stability and post-harvest quality of gladiolus cut spikes. *J. Ornam. Hort*., 8(4) : 243-248.

Van Doorn, W.G. and d'Hont, K. 1994. Interaction between the effects of bacteria and dry storage on the opening and water relations of cut rose flowers. *J. App. Bacteriology*, **77**(6):644-649.

****