Journal of Research & Development, Vol. 12 (2012) *ISSN 0972-5407*

Studies on the Effect of Pulsing on Vase Life of *Narcissus CV. Texas* under Different Holding Solutions

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ABSTRACT

An experiment was conducted to find out the vase life of harvested flowers of Narcissus Cv. Texas in various holding solutions. Different solutions including 1% sucrose, 50 ppm CaCl2, 50 ppm CoSO4, 50 ppm STS and their combinations were tested for standardizing the best holding solutions in order to enhance the vase life. 50 ppm CaCl2 in combination with 50 ppm STS proved to the best in increased solution uptake (15.53 ml to 29.20 ml), enhanced fresh weight of spathe (10.33 g to 22.13 g), flower diameter (6.36 cm to 11.00 cm), and vase life (12.33 to 18.33 days).

Keywords : Pulsing, vase life, *Narcissus* Cv. *texas*

INTRODUCTION

The vase life of cut flower can be improved by improving both pre and post harvest conditions. Senescence of cut flower involves many fold rise in production of ethylene and is accelerated by microbial load (Havley and Mayank, 1979; Mwangh *et. al.,* 2003). Use of preservative solution is beneficial for extending vase life of harvested flower at all the stages of post harvest life as it minimizes ethylene rise in addition to prone useful guard against microbial infection (Rath *et. al*., 1991). Preservatives facilitate solution uptake, prevent ethylene formation, provide energy as well as check microbial growth (Singh *et. al.,* 2000). Preservative posses anti microbial nature which

prevents xylem blockage, increase solution uptake and retention (Pal *et. al* 2003). Cut flowers are actively metabolizing living plant parts subjected to the same aging process as that of plant depending upon repairable substrates, water balance and factors like respiration and transpiration. Preservatives increases mineral uptake and reduces rate of respiration hence increase vase life (Tiwari and Singh, 2002). Preservative posses antimicrobial nature which prevents xylem blockage, increase solution uptake and retention. (Pal *et al.,* 2003) Hence, this study was undertaken to know the impact of various flower preservatives and carbohydrate sources on vase life of *Narcissus Cv.* texas.

MATRIAL AND METHODS

The present investigation was carried out at post harvest laboratory of Division of Floriculture, Medicinal and Aromatic plants SKUAST-Kashmir during spring season of year 2010. The objective of investigation was to find out the most effective treatment among different solutions (i.e. sucrose 1%, 50 ppm $CaCl_2$, 50 ppm $CoSO_4$, 50 ppm STS and their combinations) for prolonging vase life of Narcissus *Cv.* Texas under room temperature. The experiment was carried out in CRD consisting of 11 treatments replicated thrice. Harvesting was done at goose neck stage. Before putting the spathes in solution a slanting cut was given to prevent xylem blockage and ethylene rise. The observations of solution uptake (ml), fresh weight of flower (g), flower diameter (cm) and vase life (days) were recorded following standard procedures. Individual spathes was kept in a conical flask containing 300 ml preservative solution. The average of six spathes was considered as standard of all parameters observed. Vase life was recorded at 50% tepal senescence stage.

RESULTS AND DISCUSSION

The use of preservatives proved beneficial for post harvest management of cut *Narcissus* (Daffodil) *Cv.* texas.

Solution uptake was maximum (29.20 ml) under the treatment combination of 50 ppm $CaCl_2$ + 50 ppm STS (T_9) followed by combinations of 50 ppm $CaCl_2$ + 50 ppm

of 50 ppm $CaCl_2$ + 50 ppm STS (T9) followed by combinations of 50 ppm $CaCl_2$ + 50 ppm $CoSO_4$ (T8) and 50 ppm $CoSO_4$ + 50 ppm STS (T10) with solution uptake of 28.03 ml and 27.00 ml, respectively. However, T8 and T10 were at par (Table 1& Fig 1).

Table 1 : Influence of different holding solutions on vase life of *Narcissus Cv.* texas

Treatments	Solution uptake (ml)	Fresh weight of individual flower (g)	Flower diameter (cm)	Vase life (days)
T_1 (1% sucrose)	21.20	14.60	7.66	13.33
T_2 (50 ppm $CaCl_2$)	22.86	15.13	7.86	12.66
T_3 (50 ppm $CoSO_4$)	20.20	13.63	7.40	13.66
T_4 (50 ppm STS)	20.36	13.86	7.53	14.00
T_5 (1% sucrose + 50 ppm $CaCl_2$)	24.10	18.63	9.86	15.00
T_6 (1% sucrose + 50 ppm $CoSO_4$)	23.93	18.16	9.66	14.00
T_7 (1% sucrose + 50 ppm STS)	22.90	17.76	8.73	14.33
T_8 (50 ppm $CaCl_2$ + 50 ppm $CoSO_4$)	28.03	20.20	10.36	15.66
T_9 (50 ppm $CaCl_2$ + 50 ppm STS)	29.20	22.13	11.00	18.33
T_{10} (50 ppm $CoSO_4$ + 50 ppm STS)	27.03	22.10	10.23	15.33
T_{11} (Distilled water, control)	15.53	10.33	6.36	12.33
CD (P=0.05)	1.15	1.79	0.28	1.10

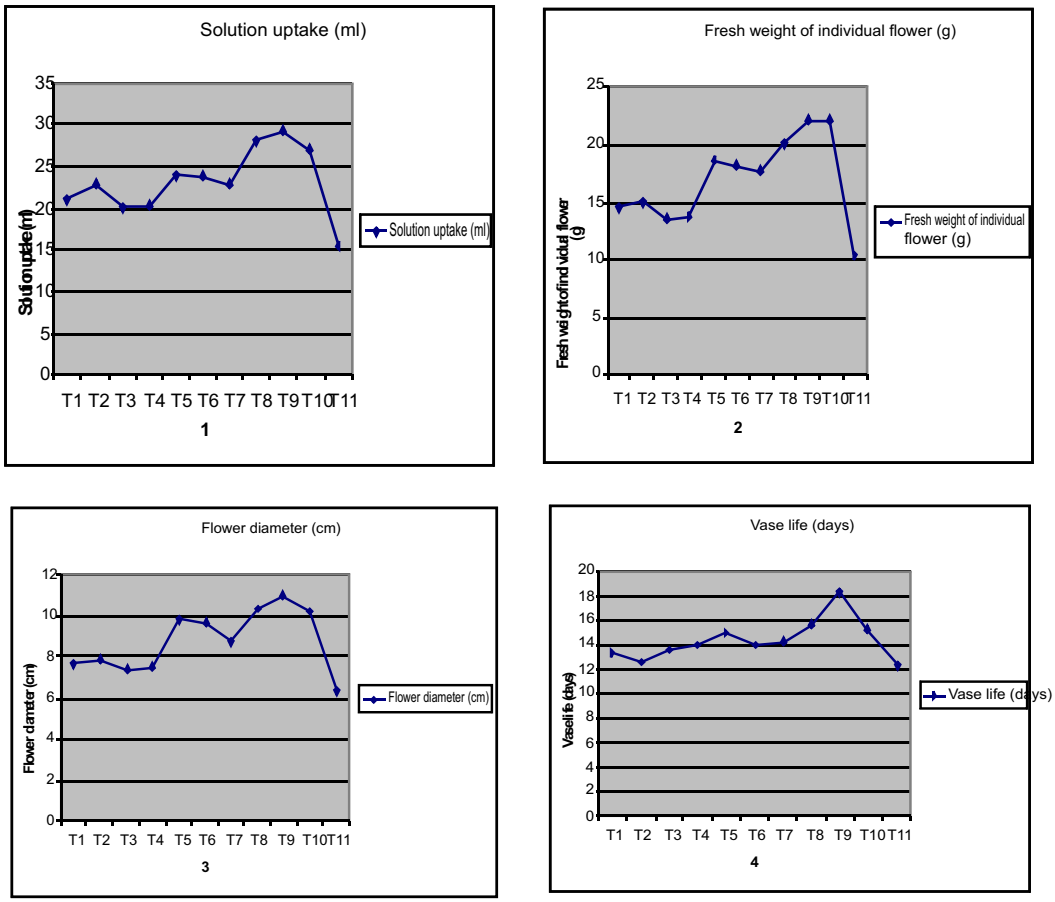

Fig: 1-4. Influence of different holding solutions on vase life of *Narcissus Cv. texas*

Treatments T_1 (1% sucrose), T_2 (50 ppm $CaCl_2$), T_3 (50 ppm $CoSO_4$), T_4 (50 ppm STS), T_5 (1% sucrose + 50 ppm $CaCl_2$), T_6 (1% sucrose + 50 ppm $CoSO_4$),T_7 (1% sucrose + 50 ppm STS), T_8 (50 ppm $CaCl_2$ + 50 ppm $CoSO_4$), T_9 (50 ppm $CaCl_2$ + 50 ppm STS), T_{10} (50 ppm $CoSO_4$ + 50 ppm STS), T_{11} (Distilled water,control)

Fig 1-4 : Fig. 1. Solution uptake (ml), Fig. 2. Fresh weight of Individual flower (g), Fig. 3. Flower diameter (cm), Fig. 4. Vase life (Days)

Maximum fresh weight of individual spathe 22.13 g was recorded with treatment T9 (50 ppm $CaCl^2$ + 50 ppm STS) followed by T8 (50 ppm $CaCl_2$ + 50 ppm $CoSO_4$) and T10 (50ppm $CoSO_4$ + 50 ppm STS) with individual spathes fresh weight of 20.20 and 22.10 g, respectively. However, the differences between T8 and T10 were non significant at 5% level (Table 1& Fig. 2)

Maximum flower diameter 11.00 cm was recorded with T9 followed by T8 and T10 with flower diameter of 10.36 cm and 10.23 cm, respectively (Table 1& Fig 3).

Maximum vase life of 18.33 days was recorded in solution combination of 50 ppm $CaCl_2$ + 50 ppm STS (T9) followed by 15.667 and 15.33days with 50 ppm $CaCl_2$ + 50 ppm $CoSO_4$ (T8) and 50 ppm $CoSO_4$ + 50 ppm STS (T10), respectively. T8 and T10 were at par((Table 1& Fig 4)

Minimum value for all the parameters including solution uptake (15.53 ml), fresh weight of flower (10.33 g), flower diameter (6.36 cm) and vase life (12.33days) were observed with control (distilled water).

Sugar solution alone or supplemented with 8HQC, silver nitrate or sodium nitrate has been reported to prolong vase life of cut gladiolus (Roychowdhury 1995). Amariti *et al* (1982) noticed that 4% sucrose along with 0.2% potassium chloride or 0.1% potassium almunium sulphate improved vase life of carnation by 4 to 6 days over control. *Gladiolus gandavensis* cv. Spic and Span tested under 8HQS, BA, GA and STS along with 2%, 4% and 6% sucrose revealed 4% sucrose together with 8HQS gave better results over other treatments (Hwang and Kim, 1995). 8HQS and $Al_2(SO4)_3$ are known for improvement of mineral salt uptake through their influence on metal ions which might have resulted in maximum solution uptake. The influence of other biocides could have influenced solution uptake in a similar way through anti microbial properties. Closely related findings were reported by Pal *et al,. (*2003) and Srivastava *et al.* (2005) in roses and gladiolus respectively. Improved solution uptake as a result of optimum supplies of sucrose was earlier reported by Pruthi *et al.,* (2001) in gladiolus.

Tiwari and Singh (2002) found preservatives like $AgNO_3$, GA, $CoSO_4$ and citric acid improve vase life of cut roses as it results in maximum solution uptake, minimum ethylene rise and has germicidal effect. Singh *et al.* (2003) also reported enhanced flower diameter in roses using $Al_2(SO_4)_3$, $CoCl_2$, chlorine, NaCl, $Ag NO_3$ and 8HQS. In yet another study Bhatia *et al.* (2002) reported the role of 8HQS and other salt based biocides in enhancing flower diameter through effective solution uptake in carnation. Pruthi *et al.* (2001) revealed enhancement of solution uptake and floret opening in gladiolus spikes at higher concentration of biocides. Similar findings related to role of STS and HQC have been reported by Bhatia *et al,.* (2002). Gowda and Gowda (1990) further reported increase of water uptake and vase life of gladiolus by calcium chloride and intervention of STS. Bhatia *et al.* (2002) and Tiwari and Singh (2002) reported the role of 8HQS and other salt based biocides in enhancing flower diameter through effective solution uptake. All these findings are closely related to the present investigation.

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