

Extension of vase life of cut chrysanthemum (*Chrysanthemum morifolium* Ramat.) flower cvs. WHITE FIZII and PEACH FIZII

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ABSTRACT

With an objective of improving the post harvest life of cut chrysanthemum flower cvs. WHITE FIZII AND PEACH FIZII, were harvested when the flowers fully opened and taken to the laboratory within 24 hours after harvest. The flowers were treated with Aluminium sulphate ($Al_2(SO_4)_3$) (100, 200 and 300 ppm) and Cobalt sulphate ($CoSO_4$) (0.5, 1.0 and 1.5 mM). The best concentration obtained from previous trial was treated with sucrose (2 and 4 %). Finally, the best combination obtained from combining mineral salts and sucrose was incorporated with germicide, 8- Hydroxy Quinoline Sulphate (8- HQS) at 100 and 200 ppm. Among the treatments tested, 300 ppm $Al_2(SO_4)_3$ + 4 % sucrose + 100 ppm 8- HQS had recorded maximum vase life of 25.8 days in cv. WHITE FIZII as compared to 14.8 days in control and registered better water balance (+ 8.0) in comparison to control (- 10.0). Whereas, in case of cv. PEACH FIZII, 0.2mM $CoSO_4$ + 4 % sucrose not only showed increased vase life of 29.0 days against 19.2 days in control but also recorded positive water balance (+ 20.8) verses control (- 8.6).

Key words : Cut flower, Charysanthemum, Vase life

INTRODUCTION

Chrysanthemum (*Chrysanthemum morifolium* Ramat.) is grown for its attractive, elegant, decorative flowers with different colour shades. The termination of vase life of many flowers is characterized by wilting and senescence of petals. Cobalt has been shown to reduce transpiration rate, microbial growth, increase the water retention and at higher levels it is toxic for fungal growth (Venkatarayappa, 1983). Aluminium compounds acidify the holding solution and lower the pH thus, reducing microbial growth and development. In addition, aluminium ions affect the stomatal status by diminishing the opening and subsequently decrease the water evaporation. The aluminium sulphate acts as an effective bacterial filter (Put *et al.*, 1992). The main effects of sucrose were to inhibit the physiological deterioration, to maintain respiratory substrates and to enhance protein synthesis (Hayashi and Todoriki, 1996). The 8-HQS has strong inhibiting effects on fungi, yeast and bacteria.

MATERIALS AND METHODS

The cut chrysanthemum cvs. WHITE FIZII and PEACH FIZII flowers were received from the Dutch flowers for vase life study, which were harvested when the flowers fully opened and brought to the laboratory within 24 hours. The flowers were sorted out for uniform flower size so as to maintain uniformity within the replications. The stems were then cut to a uniform length of 50 cm and stripped off all but the top five pairs of leaves in both the cultivars. Then each flower stock was placed in a 500 ml

bottle containing 250 ml of aqueous solutions of aluminum sulphate and cobalt sulphate used individually or in combination with sucrose and or 8- HQS, distilled water or deionized water as control.

Each treatment unit considered of five flowers with each flower represented a replication. Observations on water relations and vase life were recorded.

RESULTS AND DISCUSSION

In both the cvs. WHITE FIZII and PEACH FIZII, the maximum cumulative water uptake was recorded in treatment with $CoSO_4$. The treatments, 1.5 μ M (98.40g/fl) and 0.5 μ M $CoSO_4$ (106.80g/fl) recorded maximum cumulative water uptake as compared to control (58.00g/fl and 73.60g/fl) in cvs. WHITE FIZII and PEACH FIZII, respectively (Table 1). Cobalt ion suppress the microbial growth and development and thereby, reduces the vascular blockage. Similar results were recorded by Saradhi and Ram (1989). Treatment with 0.5 μ M $CoSO_4$ in both the cultivars resulted in positive water balance. This is in accordance with the results of Reddy (1988).

Among the treatments, the maximum vase life of 22.20 days was recorded in 0.5 μ M $CoSO_4$ in cv. White Fizii. The extension of vase life using $CoSO_4$ is attributed to cobalt ions acting as a inhibitor of ethylene biosynthesis and action (Halevy and Mayak, 1981). The Peach Fizii flowers recorded maximum vase life of 23.00 days in 300 ppm $Al_2(SO_4)_3$ vase solution. These results are in line with the observations made by Rajagopalan and Khadar (1993).

Among the different concentrations of $Al_2(SO_4)_3$ and $CoSO_4$ the best concentration was selected and further