Research Note | *The Asian Journal of Horticulture,* (June, 2010) Vol. 5 No. 1 : 254-255

Effect of chemicals in increasing the vase life of tuberose cultivars

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Accepted : *April, 2010*

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Key words : Tuberose, Cultivars, Chemicals, Vase life

Tuberose (*Polianthes tuberosa* Linn.) is an important commercial bulbous crop, widely cultivated for use in loose flower, cut flower and extraction of essential oils in different parts of India and abroad. Tuberose spikes are highly perishable in nature and need to be treated to improve their vase life and postharvest quality. Increasing vase life is the key issue in the post harvest management of cut flowers. Most of the chemicals exhibited positive effect in delaying senescence in cut roses by increasing the water uptake and improving the water balance, leading to increased fresh weight and vase life. Presence of higher moisture content tends ornamentals to highly perishable, more susceptible to mechanical and physical damage, infection by diseases and pests during and after harvest. After harvesting, cut flowers carry on all the life processes at the expense of stored reserve foods in the form of carbohydrates, proteins and fats for their longevity. Chemicals helps to prolong vase life, promote lower opening and improvement of colour and size of flowers through osmoregulation. The present experiment was therefore conducted to study the response of cut spikes of tuberose cvs. Shringar, Vaibhav, Suvasini and Prajwal and flowers of single cv. MEXICAN SINGLE in different chemicals.

The experiment was conducted in five tuberose cultivars *viz.*, Shringar, Vaibhav, Suvasini, Prajwal and Mexican single. The treatments comprised of different concentrations and combinations of Sucrose, 8HQC, $AgNO_3$, Boric acid and a control (tap water). This experiment has seven treatments, laid out in a CRD, with two replications. Two spikes was taken for each replication. The spikes were harvested between 8 a.m. to 9.00 a.m. Basal ends of cut spikes were re-cut to a uniform length of 40 cm from the lowermost pair of florets. The spikes were transferred to the flasks containing 400ml vase solution and kept under laboratory condition (temp. 28± 1^0C and R.H. 70±4%). In control treatment cut spikes were kept in tap water. In case of mexican single, the flowers were immersed in the petridishes containing chemicals and observations on different parameters were recorded.

In the present investigation, it has been demonstrated that chemicals effectively increased the vase life in all treatments than control. In case of Vaibhav,The maximum vase life of 9.1 days was recorded in the treatment T_6 (sucrose 2% + 8 HQC – 200 ppm + $AgNO_3$ 50ppm).The treatment T_0 (control) recorded lowest vase life of 6.2 days.Flower diameter was maximum in sucrose 2% + 8 HQC – 200 ppm + $AgNO_3$ 50ppm T_6 (5.50 cm) when compared to T_0 where it was lowest (4.90 cm).

A significant increase in water uptake also indicated better water retention by the treated cut flower.

Increase in vase life with 8-HQC + $AgNO_3$ is because of their bacterial properties (Mayak *et.al.,* 1994). $AgNO_3$ has also been reported as an inhibitor of ethylene biosynthesis (Beyer, 1976). Addition of sucrose might have provided the required amount of energy to the bloom to remain, it fresh for longer period of time.

In case of Shringar, A maximum vase life of 8.10 days was recorded in Sucrose 2% + Boric acid – 100 ppm and this was at par with Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm T_6 and T_5 (8 days).Vase life was least in T_0 (5.0 days).Flower diameter was maximum in T_6 (4.90 cm) and least in T_0 (3.90 cm). In case of suvasini, a maximum vase life

of 12 days was recorded in Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm T_6.This was at par with T_5 where vase life was 11.6 days.Minimum vase life was recorded in T_0 (7.5 days). Flower diameter was maximum in T_6 (6.03cm) and least in T_0 (5.01 cm). Similar results were reported by Baskar (2000).

The increase in vase life by chemicals treated spikes might be due to because translocated sugars accumulated in flowers increased the osmotic potential and improved the ability of spikes to absorb water (Reddy and Singh, 1996). Chemicals in vase solution promotes respiration, delays the onset of excessive protein degradation and thus extends the longevity of flowers (De and Barman, 1998).

The cv. PRAJWAL showed a maximum vase life of 9.1 days was recorded in T_4 and T_5 and this was at par with Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm T_6 (9 days).Least vase life was recorded in T_0 (6.5 days).Maximum flower diameter of 4.7 cm was recorded in Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm T_6, whereas T_0 recorded minimum flower diameter of 3.5 cm.In case of mexican single,a maximum vase life of 7.10 days was recorded in T_6.Least vase life was recorded in T_0 (4.13 days).Maximum flower diameter of 4.26 cm was recorded in Sucrose 2% + 8HQC – 200 ppm + $AgNO_3$ - 50 ppm T_6 and this was at par with Sucrose – 1.5% + 8HQC – 100 ppmT_5 (4.23 cm).The least flower diameter was recorded in T_0 (3.03 cm). De and Barman (1988) also recorded that glucose, aluminium sulphate and 8-HQC increased fresh weight and water conductance of rose thereby extending senescence.Similar results are also reported by Kaushal Singh *et al.* (2000), Singh and Bhattacharjee (2000) and Sivasamy and Bhattacharjee, 2000 It appears that chemicals used for enhancing vase life improved the water uptake of cut flower by reducing the vascular blockage and ultimately change the fresh weight.

From the present investigation it was inferred that chemicals greatly extended the vase life of tuberose cvs.

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