

Studies on wet storage of cut rose stems in relation to post storage treatments

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ABSTRACT

Stems of rose cv. MERCEDES were subjected to wet refrigerated storage up to 21 days by dipping basal 5-7 cm basal stem portions in water. After storage, the stems were held in vase solutions comprising of aluminium sulphate $[Al_2(SO_4)_3 \cdot 16H_2O]$, 300 ppm, sucrose 1.5% + $[Al_2(SO_4)_3 \cdot 16H_2O]$ 300 ppm ahd. water *i.e.* control. post-storage vase solutions comprising of sucrose (1.5%) + $Al_2(SO_4)_3 \cdot 16H_2O$ (300 ppm) followed by $Al_2(SO_4)_3 \cdot 16H_2O$ alone, significantly improved keeping quality of the stems.

Key words : Chemical treatments, Rose, Wet storage.

Refrigerated storage is an essential operation for preventing glut and regulating the supply of flowers in the market. Among storage methods, wet refrigerated storage is the most widely used. It has, however, been reported that in wet storage, flowers exhibit high metabolic activity due to continuous supply of water or chemical preservative solution (Goszcynska and Rudnicki, 1988; Singh *et al.*, 2001). Flowers also show decrease in the vase life following storage (Redman *et al.*, 2002; Zencirkiran and Menguc, 2003). Both pre and post storage application of floral preservatives, are also reported to improve vase life of stored flowers (Goszcynska and Rudnicki, 1988; Nowak and Rudniucki, 1990; Singh *et al.*, 2001). The present studies report the effect of post storage vase solutions on keeping quality of wet-stored cut stems of roses cv. MERCEDES.

MATERIALS AND METHODS

The stems of rose cv. MERCEDES (≈ 70 cm long) procured from Indo Israel Project, IARI, New Delhi at commercial stage of harvest were transported dry in pre-cooled boxes. The bunches were immediately put in water, cooled at 2-3°C for 6 hours and cut to a uniform length of 60 cm. The stems were stored in a cool chamber (2-3°C; 90-95% R.H) for 3, 6, 9, 12, 15, 18 and 21 days by dipping basal 5-7 cm basal stem portions in water.

After storage, the stems were put in vase solutions comprising of aluminium sulphate $[Al_2(SO_4)_3 \cdot 16H_2O]$ 300 ppm (T_1), sucrose, 1.5% + $[Al_2(SO_4)_3 \cdot 16H_2O]$ 300 ppm (T_2) and water *i.e.* control (T_3). Observations were recorded for degree of bud opening (based on numerical score 1-4; 1- up to 25% opening; 2- >25 to 50% opening; 3- >50% to 75% opening; and 4- >75% opening), vase

life, final size attained by the bud in vase and total water absorbed/stem (ml), in an air-conditioned laboratory at $23 \pm 2^\circ C$ temperature, 60-70 per cent R.H. and 16 h illumination of 1000 lux intensity provided by 40 W white fluorescent tubes. Vase life was considered to be terminated when stems showed signs of bent neck or petals showed signs of wilting. The unstored stems, similarly treated with vase solutions served as control. The data presented are mean of three replications each of three stems. The data were analyzed by the Least Square Difference test (LSD) using complete randomized design.

RESULTS AND DISCUSSION

Degree of bud opening and vase life:

Results presented in Table 1 show that there was a decline in the degree of bud opening with increase in storage duration. Bud opening was, however, slightly better in T_2 *i.e.* sucrose, 1.5% + $Al_2(SO_4)_3 \cdot 16H_2O$, 300 ppm (3.63) than T_1 *i.e.* $Al_2(SO_4)_3 \cdot 16H_2O$ alone (3.60) and was the minimum in T_3 *i.e.* control (3.31)

Vase life of the stems also showed decline with increase in storage duration (Table 1). Vase life was, however, maximum (12.24 days) with T_2 *i.e.* (sucrose+ $Al_2(SO_4)_3 \cdot 16H_2O$) and minimum (9.12 days) in control. Not only this, treatment T_2 followed by T_1 also maintained higher vase life than the control stems, throughout the storage duration. The flowers held in solution of sucrose, 1.5% + $Al_2(SO_4)_3 \cdot 16H_2O$, 300 ppm exhibited vase life of 10.11 days whereas those held in $Al_2(SO_4)_3 \cdot 16H_2O$ (300 ppm) lasted for 9.33 days after 18 days of storage as compared to 5.89 days in control. Addition of sugars to $Al_2(SO_4)_3 \cdot 16H_2O$ solution, thus slightly synergized the