▼ Journal of Research (Science), Bahauddin Zakariya University, Multan, Pakistan.
Vol.14, No.2, December 2003, pp. 187-192 ISSN 1021-1012

# EFFECT OF DIFFERENT PACKING MATERIALS ON THE POST HARVEST LIFE OF ROSE

Safina Naz
University College of Agriculture, Bahauddin Zakariya University, Multan.
email: safina_ch@yahoo.com

**Abstract:** The research was conducted to compare the post harvest life of cut roses (*Rosa hybrida* L.) when packed in polyethylene, newspaper, brown paper, butter paper and without any packing material. Four days after packing, maximum wilting was recorded in unpacked flowers followed by flowers packed in brown paper, butter paper and newspaper, whereas minimum wilting was in flowers packed in polyethylene. Roses packed in polyethylene maintained high level of fragrance. No significant differences were observed in fragrance of flowers packed in news paper, brown paper, butter paper and without any packing material, all of which had lower level of fragrance. Seven days shelf life was observed in flowers packed in polyethylene. There were no significant differences among shelf life of flowers packed in newspaper, brown paper, and butter paper. Minimum shelf life observed was 2.6 days in flowers without any packing material. The results indicate that polyethylene was best packing material because it had resulted in less wilting, high fragrance level and maximum shelf life of flowers.

**Keywords:** Fragrance, packing materials, rose, shelf life, wilting.

## INTRODUCTION

Rose (*Rosa hybrida* L.) has been considered to be "The Queen of Flowers" since its origin due to its commercial and ornamental value. Rose enjoys superiority over all flowers being extensively used for decorative purposes and is prized for its delicate nature, beauty, charm and aroma. It is certainly the best known and most popular of all garden flowers throughout the world and has been growing on the earth for many million years before the appearance of human beings [Fairbrother 1965, Gault and Synge 1971]. Some countries have adopted rose as their national flower, e.g. England, etc. [Rode and Ogale 1984].

Roses are grown for their multiple uses like production of petals, extraction of perfume, extraction of vitamin C, for medicinal uses and for sale and export as cut flowers. Due to extensive uses in life, rose has always been found favorite of mankind in all times and all climates. We are fortunate to have all types of climates in Pakistan and can produce fresh flowers round the year with little efforts and mechanization and can export the commodity to the international market.

Rose flowers exhibit short shelf life leading to difficulties with distant marketing. Shelf life allows flexibility to regulate the market by supply of flower during moderate market period and for having a greater supply during higher demand period. Under ordinary conditions, the flowers could be the source of beautification and attraction for only short time. The use of sucrose was effective in maintaining the vase life of cut rose

flowers [Chin and Sacalis 1977, De Stigter 1981, Van Doorn *et al.* 1991 and Zieslin *et al.* 1978]. Such a solution can affect shelf life, ethylene production and regulation of sugar accumulation in floral organs [Ichimura and Hisamatsu 1999], but the uses of chemicals are expensive for growers producing small number of flowers for market. An alternate to the chemicals is use of different packing materials, which is less expensive, compared to chemicals. Ahmed [1986] used polyethylene, paraffin and cellophane for storage of carnation at 0°C. Polyethylene was found better packing material followed by paraffin and cellophane. Boer [1975] compared the properties of various types of plastic and cellulose products and their suitability for packing flowers. Boer and Moelenaar [1973] compared six types of plastic films with paper as materials for packing cut roses and made observation on the life of the flowers. Marousky [1972] compared polyethylene with Kraft paper as material for packing of cut gladiolus spikes.

The objective of the present investigation was to compare the post harvest life of rose using different materials, which are comparatively less expensive.

## MATERIALS AND METHODS

Present research was carried out in the Department of Horticulture, University College of Agriculture, Bahauddin Zakariya University, Multan during Spring 2002. Uniform flowers in terms of color, stem length (40cm) and development (at tight bud stage) were selected. Immediately after harvest, flowers were brought to the laboratory and grouped into five categories on the basis of packing material. All the leaves and thorns were removed and spikes washed with distilled water and packed on the same day in different packing materials. There were five treatments, polyethylene, newspaper, brown paper butter paper and without packing material. Each treatment had 25 flowers. Ventilation holes were also made in packing materials to maintain optimum concentration of carbon dioxide and oxygen. The experiment was conducted in a completely randomized design having three replications. All the treated flowers were kept randomly in refrigerator at 5°C. The following parameters were studied:

### WILTING PERCENTAGE

This was calculated for four days by counting the number of wilted flowers from each category and data were converted to percent wilting.

### FRAGRANCE

Fragrance was scored by five subjects and the following standards were used for checking the level of fragrance:

High: 3 (Fragrance felt from 10.0 feet).
Medium: 2 (Fragrance felt from 5.0 feet).

Low: 1 (Fragrance felt from 2.5 feet).
Very Low: 0 (Fragrance felt from 1.0 foot).

## SHELF LIFE

Shelf life was determined on the basis of percent wilting in flowers. The criterion for the length of shelf life was 100% wilting.

## STATISTICAL ANALYSIS

The data collected were analyzed statistically using Analysis of Variance and the treatment means were compared at 0.05 probability level by using least significant differences (LSD) [Steel and Torrie 1984].

**Table 1:** Wilting percentage of cut roses packed in different packing materials.

| Packing Materials | Wilting (Days after packing) | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| None (Control) | 68.33 a | 90.00 a | 96.67a | 99.33a |
| Polyethylene | 00.00 d | 5.67 c | 17.33 c | 24.00 c |
| Newspaper | 30.00 c | 76.67 b | 81.67 b | 90.00 b |
| Brown paper | 36.67 bc | 71.67 b | 86.67 ab | 96.67 ab |
| Butter paper | 43.33 b | 73.33 b | 83.33 b | 92.67 ab |

Means followed by the same letter in columns are non-significantly different from each other, (LSD; P = 0.05).

# RESULTS AND DISCUSSION

## WILTING PERCENTAGE

The results presented in Table 1 show that there were significant differences in wilting percentage of cut roses for various packing materials. One day after packing the flowers showed maximum wilting in control followed by butter paper, which had less wilting percentage compared to flowers with no packing material (control) and more than flowers packed in brown paper and polyethylene. No wilting was observed in flowers, which were packed in polyethylene. Data for the second day after packing show that control resulted in maximum wilting. There was no significant difference for wilting among flowers packed in newspaper, butter paper and brown paper, which had less wilting than control and more than in polyethylene. Six percent of the flowers packed in polyethylene showed wilting on second day. Three days after packing, maximum wilting was recorded in flowers in control followed by those packed in brown paper, which had less wilting than that in control and more than that all other treatments. There were no significant differences for wilting between flowers packed in butter paper and newspaper. Flowers packed in polyethylene had minimum wilting, which increased from 6 to 17% from second to third day. All the flowers in control showed maximum wilting followed by those packed in brown paper, butter paper and newspaper, whereas minimum wilting was found in flowers packed in polyethylene. The flowers packed in polyethylene showed less wilting. Therefore, polyethylene was found to be a better packing material as compared to others because it conserves moisture and maintains

humidity due to which flowers remain fresh for longer periods. These results agree with the finding of Nicholos and Wallis [1976] and Ahmad [1986].

**Table 2:** Fragrances of cut roses packed in different packing materials.

| Packing Materials | Fragrance level (Days after packing) | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| None (Control) | 1.00 c | 0.33 b | 0.33 b | 0.00 b |
| Polyethylene | 3.00 a | 2.67 a | 2.67 a | 2.67 a |
| Newspaper | 1.00 c | 0.33 b | 0.33 b | 0.33 b |
| Brown paper | 1.33 c | 0.33 b | 0.67 b | 0.33 b |
| Butter paper | 1.67 b | 0.67 b | 1.00 b | 0.67 b |

Means followed by the same letter in columns are non-significantly different from each other, (LSD; P =0.05).

## FRAGRANCE

Data presented in Table 2 show that there were significant differences in fragrance of rose flowers for various packing materials. Maximum level of fragrance was found in flowers packed in polyethylene followed by those in butter paper, which had lower fragrance level than those packed in polyethylene and more than those packed in other packing materials. Almost equal level of fragrance was observed in flowers packed in brown paper, newspaper and without any packing material. High level of fragrance was observed in polyethylene on 2$^{nd}$ to 4$^{th}$ day after packing. There were no significant differences among flowers packed in newspaper, brown paper, and butter paper and without any packing material, all of which had lower level of fragrance. The results indicate that polyethylene was best packing material compared to other materials.

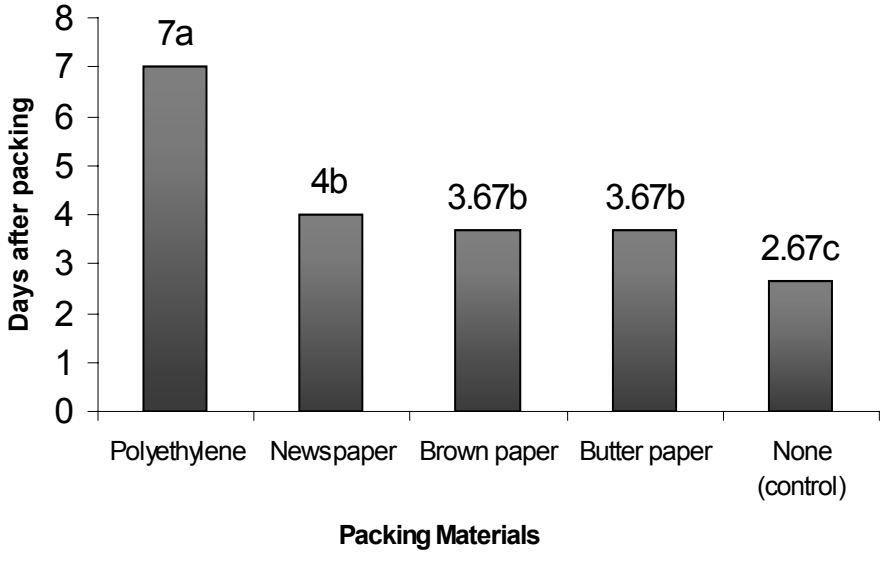


**Fig. 1:** Shelf life of rose with different packing materials.

## SHELF LIFE

The results presented in Fig. 1 show significant differences in shelf life of cut roses packed in different packing materials. Maximum life of roses was seven days, which was recorded in flowers packed in polyethylene. There were no significant differences in shelf life of flowers packed in newspaper, brown paper and butter paper. Life of roses was approximately four days in these materials, which was non-significantly different than that in polyethylene. Minimum life of 2.6 days was observed in flowers, which had been kept unpacked. Therefore, flowers packed in polyethylene had longer shelf life compared to other materials. These results agree with the findings of Staby *et al.* [1984] and Ahmad [1986].

## References

Ahmad, N. (**1986**) "Effect of different packing materials and chemicals on the post harvest life of chrysanthemum flowers" M. Sc. (Hons) Thesis, University of Agriculture, Faisalabad.

Boer, W.C. (**1975**) "Plastic film as a packing material for cut flowers", *Vakblad Voor de Bloemisterij*, 30(33), 20-21 [Hort. Absts., 1976, 46(4), 2786].

Boer, W.C. and Moelenaar, W.H. (**1973**) " Packing studies on cut flowers" *Vakblad Voor de Bloemisterij*, 28(48), 22-23 [Hort. Absts., 1974, 44(10), 7905].

Chin, C.K. and Sacalis, W.H. (**1977**) "Metabolism of sucrose in cut roses II. Movement and inversion of sucrose absorbed by cut rose stems", *J. Amer. Soc. Hort. Sci.,* 102, 5337-5340.

De Stigter, H.C.M. (**1981**) "Effects of glucose with 8-hydroxyquinoline sulfate or aluminum sulfate on the water balance of cut Sonia roses", *Z. Pflanzenphysiol*, 101, 95-105.

Fairbrother, F. (**1965**) "Roses", Penguin, Great Britain.

Gault, S.M. and Synge, P.M. (**1971**) "The Dictionary of Roses in Color", Rainbird Publishing Group Ltd., London.

Ichimura, K. and Hisamatsu, T. (**1999**) "Effects of continuous treatments with sucrose on the vase life, soluble carbohydrate concentrations, and ethylene production of cut snapdragon flowers", *J. Jpn. Soc. Hort. Sci*., 68, 23-27.

Marousky, F.J. (**1972**) "Shipping Gladious Good as New", *Agriculture Research*, 20(9), 15 [Hort. Absts., 1975, 45(7), 5152].

Nicholos, R. and Willis, L.W. (**1976**) "Benefits and Hazards with cool Storage of Narcissus", *Grower*, 85(16), 8484, 8850, 8852 [Hort. Absts., 1976, 46(42), 1155].

Rode, V.A. and Oagale, V.K. (**1984**) *The Indian Rose Annul*, 3, 89-99.

Staby, G.L., Cunningham, M.S., Holstead, C. L., Kelly, J.W., Konjoian, P. S., Eisenberg, B.A. and Dressler, B.S. (**1984**) "Storage of rose and carnation flowers", *J. Amer. Soc. Hort. Sci*., 109(2), 193-197.

Steel, R.G.D. and Torrie, J.H. (**1984**) “Principles and Procedures of Statistics”, McGraw Hill Book Co. Inc., Singapore, pp.172-177.

Van Doorn, W.G., Groenewegen, G., Van de Pol, P.A. and Berkkholst, C.E.M. (**1991**) “Effects of carbohydrate and water status on flower opening of cut Madelon roses”, *Postharv. Techno*., 1, 47-57.

Zieslin, N., Kohl Jr., H.C., Kofranek, M.C. and Halevy, A.H. (**1978**) “Changes in the water status of cut roses and its relationship to bent neck phenomenon”, *J. Amer. Soc. Hort. Sci.*, 103, 176-179.