STUDY ON EXTENDING THE SHELF LIFE OF THE CARNATION FLOWERS IN REGULAR REFRIGERATED CONDITIONS WITHOUT WATER

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Abstract

*Carnations, roses and other SPECIES OF cut flowers (harvested) are suitable for long-lasting storage, water-free (Zaharia D., 1994**).***

For this, the flowers are packed in boxes or containers lined with polyethylene film that prevents the loss of water from their tissue. The water that is lost by the flowers in the sweating process remains inside the waterproof packaging creating a high humidity environment. Under these conditions the flowers maintain their turgor, without receiving water from the exterior. (Vlad I., 2011).

One or two layers of pelur paper are placed over polyethylene which has the role of absorbing the water vapors released by the flowers, which in the case of condensation in the form of drops on the foil would cause the wilting of the flowers (Preda M., 1979). The position of the flowers in the packaging is horizontal (Selaru, 1988). The temperature of zero to + 1° C is best for keeping carnations and roses (Runger W., 1994).

Key words: carnation flowers and roses, polyethylene sheets, water-free storage.

INTRODUCTION

To increase the storage capacity of flowers it is necessary to quickly pack and place in cold conditions immediately after packaging (Grisvard, 1994).

The first researches on refrigerated storage were carried out in 1953 by Fischer who managed to keep the carnation flowers harvested in the bud phase for 39 days at 0.60 C and the roses for 18 days at 00 C. At room temperature the flowers had a duration in which they maintained their quality for almost as long as the freshly harvested ones. While keeping the flowers without water, the process of opening the flower buds is prevented and their aging is delayed (Perringsfeld,1999). The low temperature associated with the easy wilting of flowers in the case of water-free storage reduces the intensity of their breathing, the opening of the flowers and their aging, while in water, even at low temperatures, the flowers consume more intensively the reserve substances, continuing their opening and aging (Laurie, 1988).

MATERIAL AND METHODS

The experiences were carried out in 2018 at Sântandrei (Bihor) using carnation flowers of Samantha and Apollo varieties of white color and Imperial variety of pink color.

The experiences included the following:

V1 – Samantha variety flowers harvested in the bud phase stored cold for 4 weeks

V2 – Samantha variety flowers harvested in the bud phase not stored cold

V3 – Samantha variety open flowers not stored cold

V4 – Apollo variety flowers harvested in the bud phase stored cold for 4 weeks

V5 – Apollo variety flowers harvested in the bud phase not stored cold

V6 – Apollo variety open flowers not stored cold

V7– Imperial variety flowers harvested in the bud phase stored cold for 4 weeks

V8 – Imperial variety flowers harvested in the bud phase not stored cold

V9 – Imperial variety open flowers not stored cold

The flowers were harvested on June 19th. The length of the floral stem was 50 cm.

RESULTS AND DISSCUTIONS

As shown in table 1, after 4 weeks of cold storage at ± 1° C with variations of ± 0.5^0C without water (V1, V4 and V7), in cardboard packaging, after refreshment of the basal section and removing the leaves from the lower third of the stem, the flowers were put for 24 hours in water at 4^0C.

Table 1

The diameter of the flowers and the duration of maintaining the quality in water, after being kept without water for 4 weeks, compared to the flowers not kept cold (Sântandrei 2018)

Variants	Variety	The opening phase at harvest	Shelf life at cold (weeks)	Diameter (mm)				The life of the flowers in water at temperature 29^0 -32^0C	
				Initial	After 24 hours at [illegible]	After 2 days at 29 - [illegible]	Maximum	Average	Without depreciation
V1	Samantha	bud	4	41,8	46,9	58,8	78,8	6,2	6
V2	Samantha	bud	0	37,1	-	-	75,0	6,7	6
V3	Samantha	open	0	63,6	-	-	79,0	6,9	6
V4	Apollo	bud	4	39,2	45,7	55,0	75,6	6,4	6
V5	Apollo	bud	0	36,6	-	-	73,6	5,8	4
V6	Apollo	open	0	59,1	-	-	78,3	7,3	6
V7	Imperial	bud	4	38,2	52,5	58,1	72,5	5,5	3
V8	Imperial	bud	0	36,2	-	-	72,6	4,9	4
V9	Imperial	open	0	56,2	-	-	74,8	7,0	6

Then the flower pots were moved to the ambient temperature, which ranged from 29^0C (during the night) to 32^0C, where they were kept for the opening of the flowers until they reached the diameter of 55–59 mm, depending on the variety. The opening time required was 2 days, considering the time when the flowers are displayed in the outlets for sale.

After opening, the flowers were transferred to clean water and left in the same room by applying the elementary care that the buyer applies (water change and refreshment of the basal section, daily) to determine the lifetime of the flowers in the water (the decoration life) at the buyer.

Table 2

The diameter of the flowers and the duration of maintaining the quality in water, after being kept without water for 4 weeks, compared to the flowers not kept cold

(Sântandrei 2018)

Variants	Variety	Shelf life at cold (weeks)	Length of decoration at the buyer		±D	The significance of the difference
			Absolute (days)	Relative (%)		
V1	Samantha	4	6	120	1	**
V2	Samantha	0	6	120	1	**
V3	Samantha	0	6	120	1	**
V4	Apollo	4	6	120	1	**
V5	Apollo	0	4	80	-1	00
V6	Apollo	0	5	100	-	-
V7	Imperial	4	5	100	0	-
V8	Imperial	0	4	80	-1	00
V9	Imperial	0	6	120	1	**

LSD 5%- 0,61; LSD 1% - 0,92; LSD 0,1%-1,37

The duration of maintaining the quality of the flowers at the buyer is 6 days for the Samantha and Apollo varieties and 5 days for the Imperial variety after 4 weeks of cold storage without water and it can be considered good compared with the flowers that have not been preserved at cold given the poor preservation capacity of the flowers in the summer months.

The variant analysis shows a significant difference between variants 1, 2, 3, 4, 9 and V6.

The Imperial variety harvested in the bud stage, both in the case of cold storage and in the case of being kept only in water, gave weaker results compared to the flowers open on the plant.

CONCLUSIONS

1. Both the maximum flower diameter achieved at room temperature (a main indicator of quality appreciation) and the lifetime of the flowers in water after opening (decoration life) have recorded close values to the

flowers kept for 4 weeks in the cold and to those that were not subject to preservation from the Samantha and Apollo varieties.

2. Keeping the flowers water free at cold temperature has a number of advantages over keeping the flowers in the water under the same temperature conditions and some of these advantages are: saving storage space, saving packaging and labor for hanLSDing, saving water, lasting shelf life both under cold conditions and also after being brought to the environment temperature.

3. In the case of keeping the flowers without water, the process of opening buds is prevented and their aging is delayed.

4. The low temperature associated with light wilting conditions, when stored without water, reduces breathing intensity while, in water even at low temperatures the flowers consume reserve substances and continue to open and aging.

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