

Determining Seasonal Vase-life Of Carnations

STABY

Experiments to determine the value of overnight pre-treatments of carnations and the effect of climatic differences yield some surprising results

by Seward T. Besemer and Michael S. Reid

The primary objective of this experiment was to determine flower vase-life of 'White Sim' carnations each month for a one-year period (extended to 13 months). Flowers were obtained from three growers' locations and kept as separate experiments, since each greenhouse was considered climatically different. Another objective of the experiment

was to test the value of overnight pre-treatments by the producer when nothing else was done in the marketing system, as compared with adding a floral preservative in the vase-life determination.

'White Sim' flowers were obtained once each month, freshly harvested and directly from the growers, and kept out of water about four hours until placed into the pre-treatments. The four pre-treatments were deionized water, 1mM of silver thiosulfate (STS), 1mM of STS plus 10 percent

TABLE 1. Seasonal carnation vase-life, Feb. 1982 through Feb. 1983. Average days of flower life from harvest for three growers.

Treatments		February			March			April			May					
		Grower			Grower			Grower			Grower					
Overnight at 5° C	Vase at 21° C	1	2	3	1	2	3	1	2	3	1	2	3			
DI water	DI water	6.9	6.6	5.6	7.1	7.3	6.6	6.5	7.2	7.0	6.8	7.9	6.7			
DI water	2% Floralife	8.9	11.0	9.0	9.4	10.3	9.3	8.0	9.8	9.7	7.9	10.8	9.2			
STS	DI water	17.0	21.8	17.2	15.9	19.4	15.3	18.7	22.3	16.8	16.1	19.8	13.3			
STS	2% Floralife	26.0	22.2	25.5	17.8	22.6	19.8	22.2	24.3	22.6	17.3	24.5	24.0			
STS + 10% sugar	DI water	20.4	19.0	20.0	14.5	17.8	18.2	19.4	18.2	15.8	14.5	14.4	11.3			
STS + 10% sugar	2% Floralife	23.3	20.2	20.0	19.2	21.8	17.6	21.8	24.6	17.4	22.2	23.0	18.8			
Physan + 10% sugar	DI water	18.7	13.1	19.8	8.6	11.5	8.3	8.6	8.4	8.3	8.2	8.9	7.1			
Physan + 10% sugar	2% Floralife	26.4	23.7	24.8	11.2	14.3	10.6	10.4	11.8	10.0	9.7	10.0	10.4			
		June			July			August			September					
DI water	DI water	6.3	6.6	6.4	6.7	6.1	5.3	5.6	7.2	5.9	6.1	5.9	6.1			
DI water	2% Floralife	8.1	8.5	8.8	9.3	9.3	9.6	8.7	9.2	7.8	7.8	7.5	8.9			
STS	DI water	9.9	9.8	13.4	7.9	9.3	7.6	6.9	7.8	6.8	6.8	7.6	7.0			
STS	2% Floralife	14.3	17.4	18.3	13.4	12.8	17.6	12.3	12.0	10.7	10.7	12.3	12.7			
STS + 10% sugar	DI water	11.4	8.3	9.1	7.4	8.3	7.8	7.4	8.3	6.8	6.8	7.0	7.4			
STS + 10% sugar	2% Floralife	15.1	18.0	16.9	13.4	16.9	14.9	11.3	11.8	10.6	11.5	10.8	12.1			
Physan + 10% sugar	DI water	7.6	7.8	7.5	6.9	6.8	6.0	7.0	7.0	6.9	7.2	7.3	6.9			
Physan + 10% sugar	2% Floralife	9.0	9.9	9.8	9.8	9.6	10.0	9.4	10.1	8.3	10.5	9.2	11.0			
		October			November			December			January			February		
DI water	DI water	6.5	6.7	6.4	6.0	5.3	7.2	6.3	6.7	7.5	7.2	6.2	6.7	7.1	6.7	6.4
DI water	2% Floralife	8.5	8.6	7.5	7.6	6.8	8.8	7.8	9.3	8.9	8.3	8.6	7.7	10.5	9.7	12.0
STS	DI water	7.1	6.9	7.9	6.8	5.8	7.7	11.1	7.5	8.2	8.1	8.8	8.7	7.4	7.4	6.9
STS	2% Floralife	11.2	10.6	11.8	9.0	8.8	10.6	13.7	10.2	12.7	12.2	8.0	12.8	14.4	13.5	14.3
STS + 10% sugar	DI water	8.0	7.9	7.9	6.4	6.3	8.1	7.9	7.8	9.0	8.7	7.3	7.0	7.3	8.2	7.8
STS + 10% sugar	2% Floralife	11.6	12.1	12.8	9.8	9.8	13.8	10.2	11.2	13.7	12.9	11.2	12.3	13.0	13.0	14.0
Physan + 10% sugar	DI water	7.1	7.3	6.9	7.1	6.9	8.0	8.6	9.3	9.6	9.3	6.4	8.1	8.7	8.5	8.6
Physan + 10% sugar	2% Floralife	10.2	10.3	10.8	10.6	8.8	12.3	12.2	10.8	13.7	10.3	8.6	10.8	12.4	13.0	14.1

Note: DI refers to deionized water; STS refers to silver thiosulfate.

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sucrose, and 200 ppm Physan-20 plus 10 percent sucrose. Twenty-four flowers from each grower source were placed in each solution, and these were held at 0 to 5°C (32 to 41°F) overnight for a period of 18 to 20 hours.

The following day, each pre-treatment group of 24 flowers was subdivided into 12 flowers to three vases of deionized water, and 12 flowers to three vases containing 2 percent Floralife in deionized water. Therefore, three replications were made of each final vase-life treatment. The keeping room had continuous fluorescent light with an intensity of 10 lux (100 footcandles). The temperature was a nearly constant 22°C (72°F) night and day, except for July and August, when the temperature was 25 to 27°C (77 to 81°F). Relative humidity was recorded as 50 percent and confirmed with a sling psychrometer. Flowers were checked daily and removed when flaccid. Days of flower life are determined from the date of harvest.

Results and Discussion

Table 1 shows the simple averages for days of flower life from harvest

for the three growers for the 13-month period. There are few, if any, significant differences among flowers' keeping quality, which tends to disprove the belief that any major climatic differences of the greenhouse locations or grower ability had any substantial affect on flower longevity.

Another surprising result is the small variation in flower longevity during the 13 months when no treatment was used. Flower vase-life for February 1982 was significantly greater for most treatments than for February 1983. During February to May of 1982, the flowers seemed to respond dramatically to all pre-treatments of STS, STS plus sucrose and Physan plus sucrose. In fact, the authors are suspicious that the STS stock solution lost much of its effectiveness sometime after the fourth month (May 1982). In every month, however, a positive gain in flower life was demonstrated with an STS, STS plus sucrose, or Physan plus sucrose pre-treatment when only deionized water was used thereafter in the vase-life determination.

With few exceptions, the addition of sucrose to either STS or Physan as

a pre-treatment gave no additional gain in flower life (see Tables 2 and 3). The use of 2 percent Floralife in the vase-life solutions (after the grower's responsibility) added two to five days of flower life, regardless of the pre-treatments used. But the largest differences in potential flower life were mainly due to the use of an STS pre-treatment at the grower level. In fact, this experiment is a clear demonstration that if STS were used at the grower level, and a floral preservative used by all future parties, this combination would provide the best potential cut flower life of carnations.

The take-home message for all carnation growers is: Treat your carnations immediately after harvest with STS and send a care tag with each bunch instructing retailers and consumers to use a floral preservative. ◆

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Table 2. Seasonal carnation vaselife, Feb. 1982 through Feb. 1983. Average days of flower life from harvest for three growers.

Treatments		Month												
Overnight at 5° C	Vase* at 21° C	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
DI water	DI water	6.4	7.0	6.9	7.1	6.4	6.0	6.2	6.0	6.5	6.2	6.8	6.7	6.7
STS	DI water	18.7	16.9	19.3	16.4	11.0	8.3	7.2	7.1	7.3	6.8	8.9	8.5	7.2
STS + 10% sugar	DI water	19.8	16.8	17.8	13.4	9.6	7.8	7.5	7.1	7.9	6.9	8.2	7.6	7.8
Physan + 10% sugar	DI water	17.2	9.5	8.4	8.1	7.6	6.6	7.0	7.1	7.1	7.3	9.2	7.9	8.6

*All vaselife in DI water only, so that all differences are due to pretreatments overnight (20 hrs. at 5° C).

Table 3. Seasonal carnation vaselife, Feb. 1982 through Feb. 1983. Average days of flower life from harvest for three growers.

Treatments		Month												
Overnight at 5° C	Vase* at 21° C	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
DI water	2% Floralife	9.6	9.7	9.2	9.3	8.5	9.4	8.6	8.1	8.2	7.7	7.3	8.2	10.7
STS	2% Floralife	24.6	20.1	23.0	21.9	16.7	14.6	11.5	11.9	11.2	9.5	12.2	11.0	14.1
STS + 10% sugar	2% Floralife	21.2	19.5	21.2	21.3	16.7	15.1	11.2	11.5	12.2	11.1	11.7	12.1	13.3
Physan + 10% sugar	2% Floralife	25.0	12.0	10.7	10.0	9.6	9.8	9.3	10.2	10.4	10.5	12.2	9.9	13.2

*All vaselife in 2% Floralife, so that all differences are due to pretreatments overnight (20 hrs. at 5° C).

* Forced-Air Cooling on a Small Scale

Despite all the publicity in publications and seminars since 1977 on the advantages of forced-air pre-cooling of floral crops, only about a dozen major pre-cooling installations have been made in all of California. A few companies which showed leadership in using pre-cooling were Suyeasu, Cut Flower Exchange, Wilsey Bennett Trucking, Mellano and Company and Thompson Roses. Why did these companies invest? - because they sincerely wanted to deliver a superior product to the marketplace.

One simple item about pre-cooling is that it works! Also, it can be done on a small scale, basically in any floral refrigeration unit. A unit for 8 to 10 boxes is completely described and pictured on page 6 of the USDA Leaflet 21058 entitled, "Handling, Pre-cooling and Temperature Management of Cut Flower Crops for Truck Transportation." It is still available (for free) from your friendly farm advisor. ?

Gerberas - Postharvest Care

Cut gerberas need special attention to assure that consumers receive maximum value (vase life). First, cultivars of gerberas vary immensely in their genetic makeup and predictable vaselife. According to a recent report from the University of Florida by B. Tija and M.N. Rogers, the average days of vase life in plain deionized water was: Apple Blossom (9.0), Friendship (6.2), Tropic Breeze (4.2), Tropic Cloud (7.7), Tropic Lady (2.9), Tropic Princess (4.6), Tropic Summer (6.3), Tropic Sunset (4.4) and Tropic Tiger (6.5). This is a lot of variability. There are enough commercial varieties of gerberas to select ones with vaselife of seven days or more.

Second, several gerbera varieties are like some rose varieties and suffer notoriously from "bent neck." The Florida report showed a percentage of bent necks as follows (in deionized water): Apple Blossom (0), Friendship (60), Tropic Breeze (67), Tropic Cloud (20), Tropic Lady (75), Tropic Princess (20), Tropic Summer (20), Tropic Sunset (20) and Tropic Tiger (67).

Third, bent neck could largely be eliminated and vaselife could be extended at least 50 percent by: Pulsing for at least four hours in a solution of deionized water plus either 700 ppm clorox or 200 ppm 8-HQC.

Fourth, gerberas require a very clean water with absolutely no sediment or micro-organisms. Their stems are apparently more sensitive to plugging than other flowers. Using clean containers, deionized water, a bacteriacide such as clorox, Physan-20 or 8-HQC and perhaps even two percent sugar, and maybe more than four hours of pulsing, all seem like good things to try with cut gerberas.

Longevity of Lilies with STS

Using a STS (silver thiosulphate) pulsing for 24 hours (0.2 mM of STS in solution) nearly doubles the life of Enchantment Lilies. This is especially true if lilies have been exposed to ethylene.

In planting lily bulbs, emergence can be improved if dipped 24 hours in a solution of 0.2 mM STS. Even the bulbs are delayed by ethylene during storage!!

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