



# Carnation

## Recommendations for Maintaining Postharvest Quality

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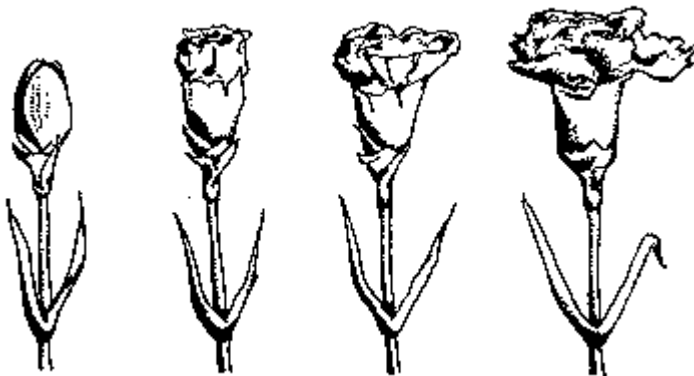
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## Description

Long one of the most important of the commercial cut flowers, standard and miniature carnations have benefited enormously from the use of silver thiosulfate (STS), which can increase their vase life two to three-fold. Carnations can be stored longer than any other flower and can be opened to high quality flowers from very tight buds.

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## Maturity



### *Standard carnations*

The maturity at which carnations are harvested depends on the proposed marketing procedure. Star-stage buds (stage 1) are too immature for most purposes except long-term storage. Buds with petals straight up (stage 2) will open quickly. Flowers for immediate use are normally harvested between stages 3 and 4.

### *Spray carnations*

Spray carnations are normally harvested with at least one open flower on each spray.

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## Harvesting

To minimize spread of disease, avoid harvesting from plants with obvious disease symptoms. Many pickers place cut flowers on the top of wires for later collection into bunches. Flowers collected into canvas slings can be taken to the shed by mechanical devices ranging from overhead cables to tractor-hauled trailers designed to hold the slings.

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## Grading & bunching

Both standard and miniature carnations are graded by stem strength, stem length, bloom diameter, and freedom from defects. Stem strength is determined by holding the stem horizontally at a point one inch above the minimum length for the grade. If the deviation of the flower head is more than 30 degrees from the horizontal (with the natural curvature down), the flower is considered defective. Other defects include slabsides, bullheads, blown heads, singles, sleepy appearance, splits, discoloration, and damage from insects and diseases.

The Society of American Florists has suggested the following grades for standard carnations:

<b>Grade name</b>	<b>Fancy</b>	<b>Standard</b>	<b>Short</b>
<b>Label color</b>	Blue	Red	Green
<b>Minimum diameter</b>			
<i>tight:</i>	2"(51mm)	13/4"(44mm)	--
<i>open:</i>	3"(76mm)	23/4"(70mm)	--
<b>Minimum length flower + stem</b>	22"(559mm)	17"(432mm)	12"(305mm)

There are 25 standard carnation stems per bunch; each bunch is tied at the base and at least one other place below the flower heads. Instead of different colored labels, some growers indicate different grades by color and/or number of rubber bands on the bunches. A miniature carnation bunch contains 30 buds total, at least 7 of which are open. With standard carnations, flower heads are alternated (5 high, 5 low) at the top of the bunch to produce a neat and compact bunch and reduce the risk of neck breakage.

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## Pre-treatments

After bunching, all carnations should be pulsed overnight in a cooler with a solution containing 1 oz/gal (6g/L) STS and 10% sucrose. A one to two hour pulse with this solution at room temperature is also quite effective.

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## Chemical solutions

Carnation buds can be opened in a solution containing 7% sucrose and 200 ppm Physan. The buds should have been treated, first, with 1 oz./gal (6g/L) STS overnight at 0° C (32° F).

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## Storage

Flowers for storage should be of highest quality, absolutely free from pests and diseases. Place them at 1° C (34° F) in a box lined with polyethylene and newspaper. Open flowers (stage 3 or 4) can be stored 2 to 4 weeks, while bud-cut flowers, harvested at stage 2, can be safely stored up to 4 or 5 weeks. There are methods available for storing stage 1 buds (or younger) for up to 4 months.

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## Ethylene sensitivity

Carnations are very sensitive to ethylene, which causes rapid inrolling of the petals of open flowers and ‘sleepiness’ or inability of buds to open.

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## Rates of respiration

Temperature	0°C(32°F)	10°C(50°F)	20°C(68°F)	30°C(86°F)	40°C(104°F)
ml CO <sub>2</sub> kg·hr	5	15	120	258	525

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## Response to CA

Carnations are one of the few flowers where controlled atmospheres have been shown to be beneficial during storage. Long-term storage of buds is improved by controlled atmosphere storage, and open flowers may store better in a low O<sub>2</sub>, high CO<sub>2</sub> atmosphere. However, properly pre-treated and handled flowers will store well in air storage, and there is little present commercial use of CA storage for carnations.

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## Freezing injury

Freezing may occur at temperatures below -0.5°C (31° F). Symptoms include water-soaking and collapse of leaves and florets.



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