

## Vase Solutions for Flowers: A review

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**Cut flowers:** Ornamental commercial flowers with elongated stem and attractive flower head are termed as cut flowers. Rose, Anthurium, Carnation, Gerbera, Chrysanthemum, Gladiolus, Heliconia and Bird of paradise are the important cut flowers ruling in the world market. Vase life of the cut flowers is determined by various factors. A flowers life span and quality attracts more customers to the seller. To sustain flowers for longer period with good quality one need to have the best combinations of vase solutions that could provide enough food, antimicrobial agents and acidifying agents.

In search of good vase solutions we have neglected nature and chemicals have reached hazardous threat to environment as well as humans. Hence, we need to explore more and more novel components for eco-friendly vase solutions. The vase solutions evolved through novel ideas are termed as 'Novel vase solutions'.

### **Post-harvest processing of flowers:**

Vase life of cut flowers is one of the most crucial factors for customer satisfaction and repeat purchase. To achieve this long vase life cut flower need to be taken through following steps.

### **Factors affecting post-harvest life of flowers:**

**Pre Harvest Factors:** These are the factors in field condition before harvest which decide flower quality.

1. Genetic or inherent makeup:
2. Growing conditions: Light, Temperature, Humidity, Water, Nutrients, Pest & diseases and Toxic gases.

**Harvest Factors:** Stage of harvest: Depends on species and cultivar, Time of harvest: Morning/evening hours, Method of harvest: Sharp knives/ secateurs, Slant cut, Avoid crushing of stem, Avoid harvesting at hard portion near soil, Hot water treatment for latex secreting stem (40-50<sup>0</sup> C for few seconds).

**Post-Harvest Factors:** Temperature, Light, Humidity, Water quality, Ethylene, Other plant hormone, Preservatives, Ventilation, Spacing and Packaging, Diseases and Pests.

### 1. Treatments for improving longevity of cut flowers: Physical treatments

A. Cut stem exuding milky fluid/ latex: Causes stem plugging.

Hot water dip for few seconds.

- Vase life of cut flower affected by stem cut ends.
- Recutting the stem in water- prevents decline in water uptake.
- Recutting eliminates air from the conducting vessels which increase rehydration rate.
- Vase life of cut flower affected by Gamma irradiation. Effect is variable depends on cultivars. A dose of 50Krad of gamma rays induced a favourable effect on prolonging the vaselife of cut rose var. Priyadarshini (Bhattacharjee and Roy, 1994)

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### Treatments for improving longevity of cut flowers

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C.Vase life of cut flower affected by Gamma irradiation.

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## 2. CHEMICAL TREATMENTS

### 1. Precooling

- It is the fast removal of field heat, it is done immediately after the harvest of flowers.
- It is done by placing in shade area without packing or in open boxes.
- It reduces respiration rate, breakdown of nutrients and senescence.
- Several precooling techniques: Room cooling, forced air cooling, hydro-cooling, vacuum cooling are available(Hobson, 1994)
- Precooling temperature varies from species to species  
 Example: Gladiolus: 5-7 °C, Bird of Paradise: 7-8 °C.

### Conditioning

- It is a simple process where the flowers are kept standing loosely in a big container, so that air can circulate around the stem.
- Purpose: Restore the turgidity of cut flowers from water stress during storage and transport.
- It is achieved by treating the flowers with demineralised water supplemented with germicide.
- Hydration improved by addition of acidifying agent to water(Durkin,1981)

Examples:

Carnation: STS 0.5mM + 70-100g/l Sucrose for 20-24 hours.

Bird of Paradise: 8HQC 250ppm + Sucrose 100g/l + Citric acid 150ppm at 200C for 4-

5h.

### 2. Impregnation :

- It is impregnating the cut end of the flower stems with chemicals for a short time.
- It protects the blockage of the water vessel in the stem by microbial growth and stem decay.

Example: Cut Rose impregnated with Nickel Sulphate 10mM for 20 min increased vase life (Reddy *et al.*, 1988)

### 3. Pulsing:

- ◆ The absorption of chemical solutions containing sugar and germicide through the lower cut bases of flower stem is known as pulsing.
- ◆ Sucrose replace the depleted endogenous CHO utilized during the post harvest life of flowers.

#### Advantages of pulsing

- Prolongs vase life of flower
- Promotes opening of buds &
- Improves colour of flower (Kuiper *et al.*, 1995)
- Helps in continuation of the normal metabolic activities after harvest and inhibits the production and action of ethylene.

Example: Rose and chrysanthemum: 2-6 percent sugar (Bhattacharjee & De, 1998, Gowda, 1994)