

POST-HARVEST MANAGEMENT IN CUT FLOWERS

Dr. Deepti Singh and Rakesh Kumar

Department of Horticulture (Floriculture and Landscaping) Bihar Agriculture University, Sabour- 813210, Bhagalpur, Bihar

Received: November, 2025; Accepted: December, 2025; Published: January, 2026

In India, post-harvest loss of cut flower account for 20 to 40%. However, with the advent recent technologies, post-harvest and post production handling of these have progressed dramatically. Researches in this field has enriched our

knowledge of the senescence process, mode of regulating the aging process and methods of preventing post-harvest and post production deterioration. The quality of cut flower is generally influenced by several factors mentioned below.

Factors affecting quality of cut flowers:

General and inherent factors: Post harvest behavior and lasting quality of flower species and cultivars vary considerably. Differences in flower longevity and quality among varieties may be due to difference in anatomical, physiological, physical, biochemical and genetic makeup. Cut flower longevity depends on carbohydrates resource of flowers, osmotic concentration and pressure potential of petal cells, stomatal functioning, differences in the no. of thick walled supporting cells in the xylem elements and phloem fibre & presence of or absence of a complete ring of secondary thickening in flower peduncles, differences in the leaf diffusive resistance of leaves in the field, lignification, level of plant hormones, susceptibility to diseases and insects.

Water relation and physiological stem plugging: A high level of turgidity is necessary for the development of cut flower buds to full bloom maturity. The stem will quickly recover its turgidity if the air bubbles are eliminated by vacuum infiltration of the end of the stem under water soon after harvest. Apart from this, physiological stem plugging occurs because of injury in the cut stem. The problem can be reduced by acidifying the water to pH 3.5, or by adding calcium nitrate or an enzyme inhibitor such as azide or DHP.

Growth regulators: In addition to the problems of maintenance of turgor and prevention of their

supply of respirable substrate, cut flower face another threat to their longevity in the form of a senescence including ethylene gas. It plays a critical role in the regulation and coordination of flower petal senescence. Cytokinins delay senescence of some cut flowers. In contrast to cytokinins, ABA generally accelerate petal senescence of isolated carnation petal. In contrast, the senescence and abscission of poinsettia flowers is delayed by auxin.

Food depletion: It occurs due to respiration and often determine the flower vase life. Refrigerated storage and floral preservatives preserve food supplies.

Bacterial and fungal infection: It shortens the flower life. Refrigeration immediately after harvesting will reduce the post-harvest diseases like Botrytis rot which is a common disease in storage while sorting, if care is not taken to discard the infected flowers, good ones will be affected during storing, transporting or marketing.

Maturation and aging: the packing of flowers for commercial marketing is influenced by season, environment, distance to market and specific consumer requirements. As flower age, they become susceptible to ethylene induced senescence.

Wilting: Excessive moisture loss through transpiration will limit the flower life. Flowers that have lost 10-15% or more of their fresh

weight usually wilt. High R.H. in storage room or moisture proof packing can minimized wilting. Use of anti-transparent can reduce the moisture loss in cut flowers. Stem clogging in vase will cause premature wilting.

Bruising and crushing: During storage and transportation, flower bruising and crushing occurs. Marketability and longevity of bruised

Factors affecting cut flowers longevity

Handling: Flower must be handled very delicately as they are highly perishable products. They should be cut at the stage that will subsequent few floral development and longevity. Some flowers can be harvested at the tight bud stage. Buds are easier to handle and less susceptible to bruising.

Harvest stage: for maximum vase life after storage most flowers should be cut at the stage that will allow subsequent full floral development and longevity. Some flowers can be harvested at the tight bud stage. Buds are easier to handle and are less susceptible to bruising.

Time of harvesting and pre-cooling : flowers are to be harvested in the afternoon hours to ensure a higher level of respiring carbohydrates in them. Flowers, especially coloured ones maintain temp. 1^o to 2^o higher than the ambient temp. Hence, their 'field heat' in to be removed by lowering their temperature immediately after harvest to ensure a low level of moisture loss from them. This is done by the process of pre cooling in which flower are immersed in cold water or by forced air cooling. This is to be followed by conditioning of sterile water of pH 3-3.5 which will ensure adequate water uptake by flower to counter transportational losses.

Grading and bunching : Damaged and diseased blooms have to be discarded. Discarded flower will contaminate other flower of the lot. Hence only good quality of flowers will be stored. Flowers and weeds are graded based on their size, width and diameter, stem length etc. and are bunched into groups of 10-25 or packed individually. The size of the bunches regulate the time taken for subsequent

and crushed flower is reduced. Hence, blooms must be handled carefully.

Temperature: Improper temperature control is a major cause of spoilage, particularly when flowers are exposed to warm temperature for long period. Holding at low temperature may cause chilling injury to some flowers.

cooling and the size of the containers used for packing.

Storage : storage is very essential for an orderly marketing of cut flowers. Temperature and R. H play a very important role during storage. How temp. reduces respiration, transpiration, enzyme activity, ethylene synthesis and microbial activities. Most of the flowers are well stored between 2^o – 4^oC except tropical orchids and anthuriums which have to be stored above 10^oC and relative humidity should be 95-98%. There are 2 types of storage :

- 1) Dry pack is used for long term storage.
- 2) Wet pack are used for short term storage or short period storage.

Air circulation in the storage atmosphere is very essential to prevent the accumulation of harmful gases like ethylene etc.

Floral Preservatives : Use of floral preservatives at all stages of flower handling and marketing is known to improve the flower quality and longevity and better consumer satisfaction. Floral preservatives usually contain water to maintain turgidity, sugar as an energy source (sucrose) a biocide to inhibit the growth of micro- organism (silver nitrate) and an acidifying agent (citric acid) to reduce pH to 3.0-3.5. There are four preservatives formulae based on the purpose of use in the floriculture industry which includes.

A) Pulsing Solution : Buds or open flowers are treated for 6-24 hrs in a vase solution containing sucrose at a relatively high concentration (3-15%) and biocides 8 HQC (8-hydroxy-quinoline citrate) before shipping, storage and marketing. The special value of pulsing treatments is that they are effective in extending vase life even when preservatives are

not used subsequently at the wholesale or conditioning level.

B) Bud opening solution : Bud cut flowers are held after harvest or storage in a solution containing sucrose (half the conc. Of pulsing solution) and a biocide for several days, until the flower open.

C) Vase Solution : Cut flowers are held in vase solutions of sucrose at a low concentration and a biocide for several days, until the flowers open to lengthen their life.

D) Conditioning : Conditioning of freshly harvested flowers, dry stored and transported flowers is known to improve quality.

Packing and transportation

The main principles of the packaging toward storage life and keeping quality are to lower the rate of transpiration, respiration and cell division during transportation. Before packing flowers should be devoid of water drops on the body and in no case should they be packed wet. Collected flower from growing centres must be free from insects and mites and to be treated with systematic insecticides and miticides. Flowers sensitive to grey mould are required to spray with fungicides. Brief treatments prior to packing by pulsing with preservative solution. Containing sugar, germicides, anti-ethylene agents and growth regulators is beneficial for cut flower. Packing must ensure protection of

Marketing

It is very important phase of any project. It is this phase that brings the product in touch with buyer or customer. It is here that the money realization take place. If this phase is not properly handled, the good efforts that have

Conditioning is done by adding very low conc. of sugar or acid depending upon the rehydration capacity of the flowers. Conditioning is done for 2-6 hrs. Conditioning is effective if only stems are recut under water and put immediately in conditioning solution.

Sanitation : Old, dead and decaying plants and plant parts have to be removed from refrigerator and work areas. They are the source of ethylene gas and decay causing m.o. buckets, vases, storage rack and rooms should be cleaned with disinfectant to keep microorganism under control.

flower against physical damage, water loss and external condition detrimental to transported flowers.

Boxes or bins made of corrugated cardboard with or without ventilation are generally used for packing cut flowers. Individual flowers or bunches are first enclosed in paper or polythene sleeves or covers and shredded paper is used for cushioning blooms against bruising while transporting to distant markets. Wet packing of flowers with moist cotton at the stem bases or by immersing stem base in water filled tube is also done. Upright placement of packages are to be specified for bud cut gladiolus and gerbera to prevent 'GEOPOBIC BENDING'.

gone into planning and production phase may not be satisfactory due to the based handling of the flowers in this phase. This phase also has great impact on the future performance of the project.