



Chrysanthemum

Recommendations for Maintaining Postharvest Quality

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Description

The second most important of the three major cut flowers, Chrysanthemums (both standard and spray) have a long postharvest life when properly handled. The chief postharvest problems in these flowers are failure to draw water (which results in premature leaf wilting) and leaf yellowing.

Maturity

Chrysanthemums are normally harvested fully open, or nearly so. It has been shown, however, that these flowers can be harvested as quite tight buds and opened satisfactorily with simple bud-opening solutions. Bud-cut standards can be harvested at stage 2 (inflorescence about 2" across) or at stage 3 (inflorescence about 3 1/2" across) when ray florets are just beginning to unfurl, or at stage 4 (inflorescence about 5" across) when fresh weight is about half that of fully developed inflorescences. Buds cut tighter than stage 2 develop smaller flowers at full bloom and are difficult to open. Stems should be placed in water containing a germicide soon after harvest. (Use 25 ppm silver nitrate in solution or a 10 second to 10 minute dip in 1000 ppm silver nitrate followed by good quality water that is low in salts.) Spray varieties can be harvested when most of the petals on the most mature flower are still upright. The flowers can be opened after storage or transportation.

Harvesting

Stems should be cut (with a knife, shears, or the specially-designed comma) at least four inches (10 cm) above the soil line to avoid taking woody plant tissue. Pinched pompons can be pulled out of the soil, and then cut to correct length. Leaves are removed from the lower third of the stems.

Grading & bunching

The Society of American Florists has suggested the following grades for fully open standard chrysanthemums:

Grade name	Fancy	Standard	Short
Label color	Blue	Red	Green
Minimum diameter	5½"(14cm)	4¾"(12 cm)	4"(10 cm)
Minimum length flower + stem	30"(76 cm)	30"(76 cm)	24"(61 cm)

Spray chrysanthemums:

Pompons are graded into 8 to 12 oz. bunches containing several stems. Standards or disbuds of equal sizes are graded into groups of 10 or 12. Each bunch of 5-8 pompons should be sleeved to prevent flowers from becoming entangled. Standards and spider mums can be wrapped individually with thin wax paper to avoid bruising and entangling florets. Some growers place individual nets over spider mum buds in the greenhouse.

Pre-treatments

Stems should be placed in water containing a germicide soon after harvest. Silver nitrate provides a very satisfactory treatment but is rarely used commercially (Use 25 ppm silver nitrate in solution or a 10 second to 10 minute dip in 1000 ppm silver nitrate followed by good quality water that is low in salts).

A more practical alternative is 5 ppm hypochlorite (1 ml Clorox in 10 liters of water) or 100 ppm Physan[®]; these are excellent germicides but may cause some stem bleaching.

Where rehydration is a problem, pulse treatments with detergent solutions (0.02% Triton-X100) have been found useful.

Chemical solutions

Bud-opening. Bud-cut, standard chrysanthemums should be placed in a bud-opening solution containing 2 to 3% sucrose and a germicide. Physan is a common, effective germicide, but it discolors the stem portion in the solution; therefore only 1 1/2 to 3 inches (4-8 cm) of solution depth should be used. After the buds are open, the injured portion of the stem can be removed. Silver nitrate at 25 ppm + citric acid at 75 ppm is very effective but more expensive to use than Physan. Silver nitrate is, however, absorbed into the stem and becomes a lasting germicide throughout the life of the flower. HQC at 200 ppm may also be used as a germicide.

Prevention of leaf yellowing. Immersion in solutions of the cytokinin 6-benzyl adenine has been shown to be effective in preventing premature leaf yellowing in some pompon cultivars that are prone to this problem. This treatment is not yet used commercially.

Storage

Chrysanthemums can be stored dry for 3 to 4 weeks at -0.5°C (31°F). Storage at $2\text{-}3^{\circ}\text{C}$ ($36\text{-}38^{\circ}\text{F}$) should not exceed 2 weeks. Yellowing of leaves can occur at 5°C (41°F) in the dark but is less likely to occur at 1°C (34°F). Proper rehydration is vital for good vase life of chrysanthemums that have been stored or shipped long distances. Remove chrysanthemum bunches from the boxes, recut stems (remove about 1 inch) and place in 40°C (104°F) water containing 0.1% Tween 20 and 75 ppm citric acid. This solution brings back turgidity within 2 hours if the room is cool and the light is subdued. After the stems are rehydrated, they can be moved to water containing 100 ppm Physan and placed in a cool room. It is possible to use a solution containing 5 to 10 ppm sodium hypochlorite (bleach) instead of Physan. Solutions containing these chlorine compounds should be replenished every 2-3 days. Sugar is not necessary in the vase solution, as it is not beneficial to open chrysanthemum flowers.

Ethylene sensitivity

Chrysanthemum flowers are not affected by ethylene, nor do they produce it. Exposure to ethylene may accelerate leaf yellowing.

Rates of Respiration

Remains to be determined.

Response to CA

Our data show that controlled atmospheres are neither injurious nor beneficial in long-term storage of chrysanthemums. Anoxic conditions destroy the flowers.

Freezing Injury

Freezing will occur at temperatures below -0.8°C (30°F) Symptoms include water-soaking and collapse of leaves and ligules (petals).



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