Special Research Report #418: Postproduction

Specialty Cut Flower Production and Postharvest Handling

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BACKGROUND

The United States cut flower industry grows and markets a diverse range of species including flowers, foliage, branches, and fruits. As production of the major greenhouse cuts – carnations, chrysanthemums, and roses – has declined, production of specialty cut flowers has increased dramatically and is now the mainstay of the cut flower industry. Specialty cuts include important greenhouse-grown species such as alstroemeria, lilies, lisianthus, gerberas, orchids, snapdragons, and tulips and field-grown species such as celosia, delphinium, gladiolus, iris, larkspur, sunflower, and zinnia.

The need for novel specialty cuts for both greenhouse and field is increasingly important to maintain consumer interest and replace production lost to imported cut flowers. Each year a large number of new cultivars and species made available from plant breeders, propagators, and suppliers are evaluated in the National Annual and Perennial Cut Flower Trial Programs, administered by N. C. State University and the Association of Specialty Cut Flower Growers (ASCFG). These new cultivars are tested at approximately 40 locations in the United States and Canada, providing valuable information on yield, stem length, and market appeal. However, a new cut flower must also have a long postharvest life.

The focus of the N.C. State Cut Flower program has been to evaluate new crops for the greenhouse and field, develop production protocols, and determine optimum postharvest handling procedures.

MATERIALS AND METHODS

The postharvest research process consists of two stages. **Stage I.** Each year an initial postharvest screening is conducted on the most promising species/cultivars from the trial programs. Stems were harvested at the optimum stage of development, sorted and placed in the following treatments:

Hydrator only
Holding preservative only
Hydrator followed by holding preservative
Distilled water only (control)

Chrysal Professional RVB Hydrating Solution (hydrator) was used at the 0.2% rate and Chrysal Professional #2 Processing Solution (holding) was used at the 1% rate.

Stage II. Each year at least 2 of the most promising species from the previous year were produced in large quantities and subjected to extensive postharvest testing examining ethylene sensitivity, anti-ethylene agents, optimum cold storage duration, pretreatments and pulses, vase solutions and substrates, and commercial preservatives.

After treatments, stems were placed in a postharvest room which is maintained at 68 ± 4^{o}F. Stems are placed under approximately 200 ftc light for 12 hrs/day.

Flowers were monitored daily to determine the end of *consumer vase life* which is the day a typical consumer would dispose of the stem. In some

experiments, the *wholesale/retail vase life* is also recorded. This is designated as the first day a change is noticed in the flower or inflorescence that would prevent it from being sold by a wholesaler or retailer.

RESULTS

As of fall 2004, 51 new cut flower species/cultivars from 21 genera have been evaluated in Stage I: *Achillea*, *Adenophora*, *Campanula*, *Caryopteris*, *Celosia*, *Dahlia*, *Dianthus*, *Digitalis*, *Eremurus*, *Eupatorium*, *Eustoma*, *Gladiolus*, *Helenium*, *Helianthus*, *Heliopsis*, *Leucanthemum*, *Lobelia*, *Matricaria*, *Rudbeckia*, *Trachelium*, and *Zinnia*. Results are available in three Research Reports: ???, ???, and ???.

In depth postharvest handling information has been determined on 8 cultivars including new greenhouse cut flowers such as *Dahlia* 'Karma', *Linaria* 'Lace Violet', *Lupinus* 'Sunrise', *Papaver* 'Temptress', and *Trachelium* 'Jemmy Royal Purple' and field cuts such as *Rudbeckia* 'Indian Summer', *Zinnia* 'Giant Scarlet, and *Zinnia* 'Sungold'. Results are available in 7 Research Reports ???-???.

CONCLUSIONS

Many of the species evaluated in Stage I had a vase life over 14 days, which is optimum for marketing and consumer enjoyment. Most species had a vase life of 10 days or more which is the minimum for wholesale production and handling. Optimum handling conditions have been described for the 8 cultivars on which extensive postharvest testing has been completed.

IMPACT TO THE INDUSTRY

This work is providing producers with information on which new cut flower cultivars have a long enough postharvest life to be successful (Stage I). The entire cut flower industry benefits from having detailed postharvest handling information provided in Stage II on selected cut flower species.

COOPERATORS

Many faculty, staff, graduate students and undergraduate students have worked on cut flowers at NC State University or assisted with cut flower projects:

Faculty
Sylvia Blankenship
William Fonteno
Lane Greer, Mississippi State University
Paul Nelson
Brian Whipker

Staff
Beth Harden
Diane Mays
Ingram McCall
Deborah McGuinn
Nancy Mingis

Graduate Students
Frankie Fanelli
Peg Godwin

FUNDING

In addition to funding from the American Floral Endowment, the NC State Specialty Cut Flower Research Program is supported by the:

$Association of Specialty Cut Flower Growers Research Fund
$Joseph H. Hill Foundation
$Fred C. Gloeckner Foundation
$Numerous seed, plant, and postharvest suppliers and cut flower producers

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