Special Research Report #506: Production Technology

Development of Herbaceous Perennials As New Flowering Potted Plants

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BACKGROUND

Gardeners continue to discover the benefits of herbaceous perennial plants in the landscape, one of the fastest growing segments of the floriculture industry. Enjoyment of perennials should extend beyond the garden and into the home environment. Providing consumers with the added value of a flowering herbaceous perennial in their homes before planting then in their garden should increase the perceived value of the plants and ultimately sales.

The goals of our research project were: (1) to develop protocols for growers and retailers to produce and profitably market flowering perennials as "new" pot crops, (2) to refine existing production protocols, (3) to investigate variables associated with postharvest display, and (4) to evaluate garden performance.

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MATERIALS & METHODS

Production Protocols

Plant selection. From 1999-2002 about 60 perennials were screened to determine photoperiod and/or cold requirements, time to flower, and basic pot potential. Plants were grown with and without 15 weeks at 41°F under short days (9 hour) or long days (16 hour provided by high pressure sodium or incandescent lighting).

Flowering Requirements. Plants with the greatest potential were evaluated for their response to photoperiod (10-, 12-, 13-, 14-, 16-, 24-hr, or a 4-h night interruption), cold duration (0, 3, 6, 9, 12 or 15 weeks at 41°F) and forcing temperatures of 57-79°F to determine the flowering requirements.

Protocol Refinement. As needed, trials were conducted on vegetative propagation, height control, branching, etc. to supplement and refine existing production protocols.

Forcing Trial. A bench-run was scheduled for ~15 perennials based on preliminary production protocols.

Postharvest and Garden Performance

The following perennials had container appeal and were chosen for postharvest and garden performance evaluation:
Aquilegia flabellata 'Cameo'
Campanula carpatica 'Blue Clips'
Campanula 'Birch Hybrid'
Coreopsis grandiflora 'Sunray'
Echinacea purpurea 'Magnus'
Gaura lindheimeri 'Whirling Butterflies'
Geranium dalmaticum
Lavandula angustifolia 'Hidcote Blue'
Leucanthemum 'Snowcap'
Pennisetum setaceum 'Rubrum'
Veronica 'Red Fox'

Plants of each species were forced into flower on May 15 or allowed to flower naturally. Half of the forced plants were stored for two weeks in a postharvest evaluation chamber

set at 22 F and 50-70% RH with ~15-20 μmol·m^{-2}·s^{-1} from cool white fluorescent lights for 12 h per day. Flower longevity, flower quality, bud abortion, leaf yellowing, and other pertinent quality changes were monitored for two weeks.

Plants not stored in the chamber remained on the greenhouse bench until planted on May 31 in garden plots. They were evaluated for a period of two or three years depending on species.

RESULTS

Production protocols. The selections identified as potentially suitable contenders for flowering potted plant production are listed below.

Highly promising perennial selections from 2000-2002.

***Achillea millefolium* 'Red Velvet'**
***Agastache* x'Blue Fortune'**
***Aquilegia* 'Origami'**
***Aquilegia* 'Winky Double'**
***Campanula* 'Kent Belle'**
***Campanula punctata* 'Cherry Bells'**
Corydalis lutea
Delosperma cooperi
***Delphinium* 'Volkerfrieden'**
***Delphinium* 'Summer Blues'**
***Digitalis grandiflora* 'Carillon'**
***Digitalis purpurea* 'Foxy'**
***Erigeron* 'Prosperity'**
***Gaura lindheimeri* 'Siskiyou Pink'**
Laurentia axillaris
***Oxalis crassipes* 'Rosea'**
***Sisyrinchium* 'Puerto Yellow'**
***Tanacetum niveum* 'Jackpot'**

Perennials with superior container potential.

Corydalis lutea

Laurentia axillaries

Protocol refinement. Production protocols for several species were refined and published as a series of articles entitled "Turning Perennials Inside Out" in the leading industry publication GMPro magazine.

Additional protocols have been determined for:
***Achillea millefolium* 'Red Velvet'**
***Agastache* x'Blue Fortune'**
Delosperma cooperi
***Gaura lindheimeri* 'Siskiyou Pink'**
***Oxalis crassipes* 'Rosea'**

Postharvest and Garden Performance. The majority of the perennials performed satisfactorily in the postharvest environment for up to two weeks. Generally, postharvest treatment had a minimal influence on subsequent garden performance.

This study demonstrates that the forcing of perennials has no adverse effect on overwinter survival and, generally, no effect on garden performance. . The majority of forced perennials tested performed satisfactorily in containers and in the garden. For species such as *Veronica*, there was some reduced flower show in the first year due to a limited flowering period.

CONCLUSIONS

We selected a number of superior flowering perennials that have container appeal. We have successfully detailed their production requirements. Forcing herbaceous perennials into flower for spring sales does not have deleterious effects on garden performance or overwinter survival of the species tested.

IMPACT TO THE INDUSTRY

There are thousands of herbaceous perennials which growers and gardeners can utilize. With detailed production information on specific species and cultivars, growers and retailers can provide consumers with flowering herbaceous perennials on any given date. This provides growers with an added value product that consumers can enjoy initially in the home and then subsequently in the garden.