

RESEARCH NEWSLETTER



This Flower Bulb Research Program Newsletter is published by Anthos, Royal Trade Association for Nurserystock and Flowerbulbs in cooperation with Dr. Bill Miller of Cornell University.



Pictures left and above:

Seasonal sequence of 'Ice Follies' narcissus and *Pulsatilla vulgaris* 'Papageno', a beautiful combination where the bulb and perennial are flowering at the same time in Ithaca NY. Note the striking color echo between the flowers in the middle picture.



Combining Flowerbulbs and Perennials: Increasing the Market for Both

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Given the current trend of container gardening, and mixed containers, it comes as no surprise that consumers are more and more interested in mixed bulb and perennial plantings. The classic partnering of narcissus and daylily provides a nearly perfect combination of utility and beauty: the daffodil will flower before the day lily leaves are too tall, so the full flower effect can be viewed, but soon thereafter, the daylily leaves hide the senescing daffodil leaves.

Perennials have exploded over the last 10-15 years, and have increased at a greater rate than bulbs. Why is this? Perhaps it is due to more ways to purchase perennials for garden use: bare root, young growing plants, or as mature plants in larger containers. Plus, many perennials can be purchased in color, either in the natural season or through accelerated flowering (forcing). Bulbs simply do not present as many opportunities, since the typical gardener only had a small window in the fall to purchase spring flowering bulbs. Certainly, if the industry can provide more reasons to use bulbs in the landscape, especially to promote companion plantings, increased sales might result. Increased sales are not enough, however, as consumer satisfaction is ultimately the key. This demands high quality products and timely information. Hopefully this project will ultimately provide some of the needed information.

Reasons for combinations

Why are gardeners interested in plant combinations, specifically bulb and perennial combinations? The main reasons are functional or aesthetic. Here are a few examples of each:

- Extending the bloom season. Since bulbs are the earliest major component in the garden, their use, is of obvious importance in lengthening the season of the garden.
- Hiding/covering senescing bulb foliage. After a spring bulb flowers, the leaves senesce (lose their green color), a process that lasts several weeks. While important for bulb filling and, ultimately, long-term perennializing of the bulb, the yellowing leaves are unattractive. Thus, the functional hiding covering of bulb leaves is an important facet of a good combination.
- Contrasting or complementary leaf texture. Leaf texture is an important design element, and due consideration should be given to it. A good example of contrasting leaf texture is the daffodil/poppy combination seen in this newsletter.
- Color. Most spring bulbs flower before the majority of herbaceous perennials. Thus, color can be used in a sequence from bulb to perennial (e.g., 'Tahiti' narcissus of a roughly similar shape and color as the later-flowering *Trollius* (globeflower). The result is a longer season of bloom within the same garden space. One may also use color from one plant to complement or contrast the colors of another. This is called "color echoing" and is an important way to tie plants together in the overall design. Color echoes may occur between leaves and flowers (see Figure 1 showing 'Queen of Night' and *Sedum* 'Matrona') or between flowers (see the daffodil and *Pulsatilla* combination),



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What we did

A list of bulb cultivars was developed in consultation with Frans Roozen of the IBC. In the fall of 2004, bulbs were shipped to 5 locations in the US: Ithaca NY (Cornell University, USDA winter hardiness zone 5), Riverhead New York (Cornell University, Long Island Research and Extension Center), Guelph Ontario (University of Guelph, zone 4), Columbia SC (Riverbanks Zoo, Zone 8, humid), and Dallas TX (Dallas Arboretum, zone 8, dry). Bulbs were interplanted among established perennials at each location, in combinations hoped to be interesting at each site. In total, more than 400 combinations were planted. Flowering and timing data were collected in 2005 and 2006, and it is expected to continue this trial for another flowering season (through 2007).

I thank Mark Bridgen (Cornell, Long Island), Rodger Tschantz (Univ. Guelph), Andy Cabe (Riverbanks Zoo) and Jimmy Turner (Dallas Arboretum) for their invaluable assistance with this project.

Preliminary Results

In general, the results in Dallas were disappointing as far as bulb return flowering in the second year. No tulips repeated, and only 1 hyacinth. Narcissus were generally OK in the second year.

In South Carolina, a somewhat better showing occurred, but still there were challenges with tulips and daffodils. It is already well known that many daffodils perennialize well in the Carolina Piedmont and throughout most of the state.

In Guelph, Long Island and Ithaca, things fared better, overall, due to a colder winter climate which is obviously helpful for winter cold requirements. There are some photos of some of the Cornell and Guelph combinations nearby. Our particular observations in Ithaca indicate much better second year flowering of tulips as compared to our earlier trials on perennialization in 1999-2003. We don't have a specific reason why this might be, but await results in 2007 for final conclusions.

A series of photos are nearby showing seasonal pro-

gressions of several successful combinations. These are from bulb flowering, through leaf senescence, to full growth of the perennial to give a sense of the changes in relative bulb size versus the perennial.

A limitation of this study is the lack of truly excellent photography. If the industry is to fully capitalize on this and related studies, gardens will need to be planted for professional photographic documentation for sales aids, posters, cappers, etc.

Please contact Bill Miller at wbm8@cornell.edu for additional information on this project.

New pest management publication from Cornell

A new publication outlining crop management techniques is now available online!

The 2006 Cornell Guide for the Integrated Management of Greenhouse Floral Crops

contains 152 pages of information on the management of greenhouse crops, including best management practices and specifics on insect and disease control, and growth regulator use. It may be downloaded (free of charge) in its entirety at

<http://www.hort.cornell.edu/greenhouse/pestsdis/FloristGuidelines06.html>



Picture above:
An example of a "color echo" of purplish 'Queen of Night' tulip with the dark leaf edges of *Sedum* 'Matrona'. In this case, the color echo is between a flower and a leaf.



Above:
Two views during the season of tulip 'Ballade' and *Helenium autumnale* interplanted in Guelph, Ontario. An excellent example of a functional companion planting.



Pictures above:
A seasonal sequence showing tulip 'Scarlet Baby' and *Geranium walliachianum* 'Buxton's Blue' interplanted in Guelph, Ontario.



Pictures above:
Tulip 'Don Quichotte' combined with *Geranium* 'Claridge Druce'. Ithaca, NY.

Pictures above:
Seasonal views of *Narcissus* 'Fortissimo' and *Papaver orientale* 'Turkenlouis' in Ithaca NY. Second year flowering. A combination like this actually allows the possibility of three flower sequences, as the poppy will senesce early, and allow annuals to be used for mid and late summer color. Note the interesting texture contrast in the second photo.

Pictures above:
Tulip 'Queen of Night' combined with *Sedum* 'Matrona'. All pictures from the second year of flowering in Ithaca. This is an example of a strongly clumping perennial (non-spreading), where bulbs can easily be massed or dispersed between the clumps (top photo). In the middle photo, the full flower impact of the tulips is seen. The effective covering of the tulips is seen in the lower photo.

Pictures above:
Narcissus 'Gigantic Star' and *Achillea millefolium* 'Summer Pastels'. Second year flowering, Ithaca.