

1999

Herbaceous

Perennial Trial

Results

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Introduction.

As herbaceous perennials are becoming increasingly popular with the gardening public, the rush to provide such plant material for the market often perpetuates the misnomer of winter hardiness. Many, but not all, perennial breeder/producer/distributor companies initiate trialing in northern zones. Frequently these only include Z5-Z6 in their scope. Other new releases from herbaceous perennial breeders are listed with zone-specific hardiness that was derived from published information for the original species. Usually the hardiness of these new releases is never scientifically validated, over years, prior to release due to the rapid pace and competitiveness of the annual bedding and perennial plant markets.

Unlike annuals that complete their life cycle without the need to over-winter, winter hardiness of herbaceous perennials is of particular importance to home gardeners and other consumers. The name perennial denotes the assumption that the product will be winter-hardy. Consumers have become wary after disappointing performance of products that did not meet the minimum expectations. For instance, *Gaura lindheimeri* ‘Siskiyou Pink’, ‘Whirling Butterflies’ are hardy to Z6 yet every year consumers find these being retailed as “hardy” plants in Z3-4 regions; most “hardy mums” sold on the market are also not hardy north of Z5, with the notable exception of select releases from the University of Minnesota breeding program.

The annual bedding plant industry companies test material at their secure trial sites, as well as in the national network of All America Selections (AAS) testing sites. Such national testing provides breeder, producer, distributor, grower, and retailer companies with data to select plant material with wide adaptation across the nation or specific regions, e.g. the south (heat/drought tolerant plants) or north (cool crops for fall/spring sales). An organized, national test system for herbaceous perennial plants does not exist. AAS does not have specified categories for herbaceous perennials. If they are trialed in AAS, they are evaluated as “annualized” perennials only, i.e. their ability to flower in the first year from seed/cuttings with at least equal performance against varietal standards or comparisons. Since AAS trial sites are replanted each year, no winter survival over years is possible. Individual companies may have organized public and/or private trialing of perennials. For instance, Blooms of Bressingham Perennials™ N.A. (Lapeer, MI) conducts performance evaluations and hardiness tests for each year’s new releases. This provides a gauge of performance/hardiness across various regions.

In 1998 John Erwin, Mary Lerman, and Steve Poppe initiated a new research direction for herbaceous perennial testing—combining breeding and crop physiology. The trial sites were chosen and initial plantings were done that year. In 1999, Neil Anderson joined the team as an herbaceous perennial breeder. The program focuses on improving perennials through research in plant breeding, production, use, and testing in replicated trials at multiple locations. Critical information on winter hardiness in Z3/Z4 is an additional criteria in the research. Such will provide this rapidly growing sector of the ornamental industry with a strong base of plant materials and information to maintain the strength and growth of the garden perennial market.

Plant Evaluation Sites.

Three sites have been established with high public visibility for exposure to consumers and Minnesota/national commercial floricultural and nursery growers/researchers. All sites have sun and shade conditions. Signage identifies the plant materials and the companies donating the new cultivars. Grower and home-gardener field days during the peak flowering season exposes the local industry and consumers to the new introductions for on-site evaluation. The gardening public and growers can also rate the various plant materials on a yearly basis.

The three testing sites are as follows:

1. [Department of Horticultural Science, University of Minnesota](#), St. Paul, MN. USDA Z4. At this site plant material is planted in full sun.
2. [Lake Harriet Gardens, Minneapolis Park and Recreation Board](#), Minneapolis, MN. USDA Z4. This site includes both full sun and partial shade plantings.
3. [West Central Research and Outreach Center, University of Minnesota](#), Morris, MN. USDA Z3/4 (borderline between Z3 and Z4). This site includes both full sun and partial shade plantings.

Plant Material.

The following genera have been designated for testing at all three sites, based on input from northern consumers, growers, and other horticultural professionals. Additional genera are included as new releases surface with market potential. Plant material of particular interest are new cultivars/varieties for which winter hardiness is unknown or that will be of interest to consumers and the ornamental industry. A minimum replication of four plants per accession are planted at each of the three sites.

Genera for evaluation include:

1. *Agastache*
2. *Artemisia*
3. *Asclepias*
4. *Astrantia*
5. *Baptisia*
6. *Echinacea*
7. *Geranium*
8. *Heuchera*
9. *Heucherella*
10. *Nepeta*
11. *Perovskia*
12. *Phlox*
13. *Pulmonaria*
14. *Sedum*
15. *Stachys*
16. *Tiarella*

Plant material trialed in the sites is not propagated nor distributed to interested parties. Rather, all parties are directed to contact their distributors or the original source company (breeder/producer) directly to obtain the plant material.

Evaluation Criteria.

During each growing season, the herbaceous perennials are evaluated for various criteria. Of particular importance is winter hardiness and overall performance during and after establishment at the trial sites. The following criteria are used for evaluating the germplasm:

1. Winter hardiness
2. Disease and/or pest susceptibility, tolerance, or resistance.
3. Cultural responses to cutback, growback.
4. Plant morphology: height x width measurements, stem strength.
5. Flowering: time of 100% flowering, duration.
6. Reseeding or invasiveness: tendency to form asexual and/or sexual propagules, their dissemination, and competition with the parental source.
7. Floriculture and Nursery Industry ratings: Used to make the top three Minnesota Select Perennial Winners.

1999 Results.

This is the first year of reporting winter hardiness and performance evaluations of herbaceous perennials in replicated trials (≥ 4 plants/site) in USDA Z3/4 and Z4. Before 1999 and the arrival of the herbaceous perennial breeder, the first trialing year had several difficulties. In some instances, insufficient numbers of perennials were received for planting at all three sites. As a result, some plantings at Morris (Z3/4) did not occur and data may be missing for this site for various accessions.

1999 Minnesota Select Top Three Perennials.

1. *Asclepias incarnata* 'Ice Ballet'. While this was not 100% hardy in Z4, evaluators liked the reseeding tendencies of 'Ice Ballet' as the preponderance of seedlings filled in all gaps between the surviving plants. The result was a sea of white clouds floating above the green foliage. A very nice effect.
2. *Perovskia scrophulariaefolia* 'Superba'. Everyone liked the superb coloration, plant stature, stem strength, and persistence of color through the fall. While not the hardiest of the Russian sages (75% for Z3/4, Z4), it is nonetheless an outstanding choice for northern gardens.
3. *Sedum spectabile* 'Brilliant'. This sedum had spectacular winter hardiness (92%, Z4), top ratings for flower stalk strength and floral display with a well-rounded plant habit (as tall as it was wide, 73x79 cm). The floral coloration matched the name of this cultivar, especially during the cooler season of September/October.

Hardy perennials with superior performance.

For those accessions planted **during 1998 only**, the following herbaceous perennials were found to have an average of $\geq 62\%$ winter hardiness, high rankings in floral display, stem strength, and minimal invasiveness. These are highlighted with a dark background on the 1999 Trial Data Tables.

1. *Agastache rupestris* 'Blue Fortune'
2. *A. rupestris* 'Snow Spike'
3. *Artemisia dracunculus*

4. *A. lactiflora*
5. *A. ludoviciana* 'Silver Queen'
6. *Asclepias incarnata* 'Ice Ballet' **1999 Minnesota Select Perennial.** Note: While it had only 62% winter survival, it's tendency to reseed filled in the areas where the original clones had been lost.
7. *Echinacea purpurea* 'Bravado'
8. *Fragaria sp.* 'Pink Panda'
9. *Geranium x cantagrigenae* 'Cambridge'
10. *G. x cantagrigenae* 'Karmina'
11. *G. macrorrhizum* 'Ingwersen's Variety'
12. *Hemerocallis x hybridus* 'Miss Mary'
13. *Heuchera sp.* 'Brandon Pink'
14. *Nepeta x faassenii* 'Blue Wonder'
15. *N. x faassenii* 'Six Hills Giant'
16. *N. x faassenii* 'Walker's Low'
17. *N. sibirica* 'Souvenir d'Andre Chaudron'
18. *Perovskia abrotanoides* 'Filigran'
19. *P. abrotanoides* 'Longin'
20. *P. scrophulariaefolia* 'Superba' **1999 Minnesota Select Perennial.**
21. *Phlox maculata* 'David'
22. *Sedum alboroseum* 'Autumn Joy'
23. *S. alboroseum* 'Frosty Morn'
24. *S. maximum atropurpureum* 'Rosy Glow'
25. *S. spectabile* 'Brilliant'. **1999 Minnesota Select Perennial.**
26. *S. telephium* 'Indian Chief'
27. *S. telephium* 'Vera Jameson'
28. *S. variegata*
29. *Stachys byzantina* 'Helene von Stein'

Border-line Hardy Perennials.

Based on the data collected from plantings during 1998 only, the following perennials were found to have minimal survival, i.e. $\leq 50\%$ survival in both Z3/4 and Z4 (unless otherwise noted). As such, we are classifying these as border-line winter hardy perennials. With this low winter survival rating, gardeners would be advised that mulching may be necessary to ensure minimal survival and, **more likely**, these should be treated as annuals. Additional data from this next winter will further clarify the hardiness of these border-line taxa.

1. *Agastache mexicana* 'Mauve Beauty' Z4
2. *A. rupestris* 'Pink Panther' Z4
3. *Artemisia stelleriana* 'Silver Brocade' Z3/4
4. *Aster sp.* 'Alma Potchke'
5. *Campanula sp.* 'Chettle Charm'
6. *Echinacea sp.* (white)
7. *Erigeron sp.* 'Prosperity'
8. *Geranium sp.* 'Bressingham's Delight'
9. *Helenium sp.* 'Coppelia'

10. *Heuchera* sp. 'Harmonic Convergence'
11. *Nepeta x faassenii* 'Dropmore'
12. *Phlox maculata* 'Franz Schubert'
13. *P. maculata* 'Miss Karen'
14. *P. maculata* 'Miss Wilma'
15. *P. maculata* 'Natasha'
16. *Polemonium* sp. 'Brise d'Anjou'
17. *Tiarella* sp. 'Crow Feather'

Non-hardy Herbaceous Perennials.

The following perennials (**planted during 1998 only**) were found to be non-hardy in Z3/4 and Z4 trial sites (unless noted otherwise below), i.e. 0% winter hardiness. These should be treated as annuals in northern gardens and not as perennials that can be expected to survive the winter.

1. *Agastache barberi* 'Firebird'
2. *A. barberi* 'Tuti-Fruti'
3. *Agastache mexicana* 'Mauve Beauty' Z3/4
4. *A. rupestris* 'Apricot Surprise'
5. *A. rupestris* 'Pink Panther' Z3/4
6. *Artemisia lactiflora* 'Guizho'
7. *Baptisia lactea (leucantha)* Z3/4
8. *Echinacea* sp. (purple)
9. *Geranium x oxonianum* 'Claridge Druce'
10. *G. x oxonianum* 'A.T. Johnson'
11. *G. sp.* 'Bressingham Purple'
12. *Helleborus niger*
13. *H. odoratus*
14. *Heuchera* sp. 'Autumn Haze'
15. *H. sp.* 'Bressingham Hybrid'
16. *H. sp.* 'Strawberry Candy'
17. *Kniphofia* sp. 'Bressingham Comet'
18. *K. sp.* 'Shining Scepter'
19. *Phlox pilosa* 'Eco Happy Traveler'

Consult the following [summary table](#) to determine the performance of the herbaceous perennials of interest to you. Remember that this is only the first year's report on performance for material planted in 1998. Data from 2000 and 2001 will either further substantiate or modify the recommendations made above.

Please feel free to visit any or all of the testing sites during the 2000 growing season!

The Summary Table for 1999 is Available at:

<http://www.florifacts.umn.edu/1999perennialtable.pdf>

Legend for Tables.

Sources of Perennials.

AOP=American Ornamental Perennials
BB=Blooms of Bressingham
BIB=Blue Bird Nursery
BIN=Blooming Nursery
BN=Bailey Nursery
BP=Bluestone Perennials
BSC=Ball Seed Co.
GL=Green Leaf Enterprises
H=Heronwood Nursery
HC=Horticulture Club, University of Minnesota
NC=North Creek Nurseries
NG=Niche Gardens
PAS=PanAmerican Seed Co.
SG=Skagit Gardens
SO=Shady Oaks Nursery
TN=Terra Nova
VB=van Bourgondien
WFF=White Flower Farm
WG=Walters Garden

Year Planted.

98=second year evaluation; data for winter hardiness is the first year recorded. Data is pooled over replications. In some instances, more than n=4 replications were included at one site. Data from Z4 (St. Paul, Minneapolis) sites will be pooled in future years.
99=first year of evaluation; plants were planted during the 1999 season, so any data included is not indicative of the accessions full potential after establishment and over-wintering. Many did not flower during the first year.

% Winter Survival.

% winter survival = [number of reps. Surviving] / [total number of reps. per site].
Calculated only for those planted during 1998.

Date of 100% Flowering.

Date when 100% of the replications at each site were in flower. We will amend this in future years to include the duration for providing color (flowering) in the landscape.

Flower Stalk Strength.

Measured on a scale of 1-5, with 1-2 meaning weak/lodging; 3-5 denoting increasingly stronger stems.

Floral Display.

An indication of floral coverage over the plant surface area.

Ex=Excellent, 75-100% coverage

Gd=Good, 50-75% coverage

Fr=Fair, 25-50% coverage

Pr=Poor, <25% coverage

Height x Width.

Measured in centimeters (cm) at flowering.

Reseed or Invasive.

In second-year plantings, indicates seedlings or vegetative propagules surrounding original plants and tendency to become invasive (spreading in the trial gardens). If the cultivars were very invasive, the seedlings/veg. propagules had achieved 100% cover in the plot and the original clones were difficult, if not impossible, to identify.

Comments.

Additional notes recorded during the observational year.