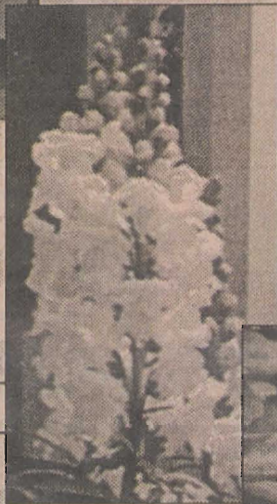


1994 Edition

CULTIVAR TRIALS

OF BEDDING PLANTS



Minnesota Report 233-1994
Minnesota Agricultural Experiment Station
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UNIVERSITY OF MINNESOTA

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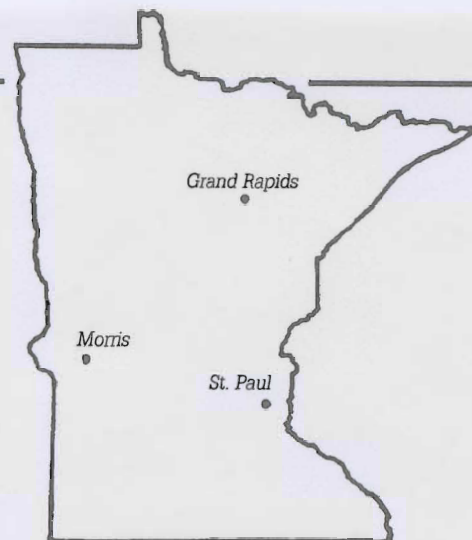
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1994 EDITION

CULTIVAR TRIALS OF BEDDING PLANTS



Test locations for the cultivar trials reported in this publication.

Continued growth of over 15 percent per year has marked the bedding plant industry since 1978. On the wholesale level, producing annuals and perennials has become a billion-dollar business nationally. The University of Minnesota supports this growing industry in Minnesota in various ways, among which are the cultivar trials conducted on Minnesota Agricultural Experiment Stations at Morris, St. Paul, and Grand Rapids.

At these sites, new and old cultivars are grown from seed donated by seed companies, planted out, and rated periodically for field performance. The gardens are open to the public and industry for self-guided tours throughout the growing season, providing a unique opportunity to compare performance of bedding plant cultivars under regional conditions.

In this publication, results from all three sites are summarized. The data reflect the growing conditions at each site during 1992 only; cultivars may have performed quite differently in previous years. For results from earlier trials, contact the site supervisor directly, or obtain earlier editions of this publication from the MES Distribution Center. Not all years may be available.

All-America Selections

Each of the sites is also designated an official All-America Selections Display Garden, joining the Minnesota Landscape Arboretum at Chanhassen in that honor. The All-America Selections organization, founded in 1932, tests new cultivars and introduces those with superior performance to the horticultural public. Winners are selected on the basis of trials in official AAS Trial Gardens and are readily available from retail seed companies. As official AAS Display Gardens, each Minnesota site grows the current year's winners as well as past selections. Our trial grounds allow comparison between these national winners and local favorites.

Rating the Cultivars

Bedding plants are grown for the ornamental value of their foliage and flowers. In rating cultivars entered in the trials conducted by the Minnesota Agricultural Experiment Station, the two aspects of foliage and flowers are each rated independently on a 1 to 5 scale where 1=poor and 5=very good. The values are added to create an overall quality rating of 1 to 10. An exception is made for plants such as kale and dusty miller which are grown for foliage only. In those, the vegetative rating is simply doubled.

Ratings are taken several times during the growing season, typically mid-July, mid-August, and mid-September. The objective is to assess quality over the growing season, so the actual dates vary per site to accommodate differences in climate. Care should be taken when studying the ratings for herbaceous perennial bedding plants. Most perennials do not normally bloom well the first year from seed, and their lower overall ratings reflect that fact.

Plant height and flower size are measured at field maturity. Height is often less than the maximum at Grand Rapids due to the shorter growing season. Flower size is relatively unaffected by location. "Flower size" usually refers to the width of a single blossom, but in certain cases, specified in a given table's footnotes, it may mean the length of a spike (i.e. snapdragon) or width of a head (i.e. geranium). In the case of foliage plants, flower size is not available (n/a).

Unlisted Cultivars

The selection of plants and cultivars to be emphasized in Minnesota's trials varies from year to year. Their selection is based on results of previous trials, on current trends and on industry recommendations. Relative performance data for many plants and cultivars not in this *Cultivar Trials of Bedding Plants* may be available in editions from other years.

Acknowledgements

Authors of this publication are Anne M. Hanchek, Steven R. Poppe, and David K. Wildung. Additional text is by Larry A. Etkin.

Cultivar trials in 1993 at St. Paul, Morris, and Grand Rapids were supervised by Bradley Pedersen, Steven R. Poppe, and David K. Wildung, respectively. Many thanks are due station staff and Minnesota Extension Service Master Gardeners for their assistance in conducting the trials.

Thanks also to All-America Selections for information, photos and artwork on AAS winners illustrated in this publication. The cover background photo is by Don Breneman.

Disclaimer

Reference in this publication to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Minnesota Agricultural Experiment Station or the University of Minnesota is implied.

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Editor, production manager
and publication designer Larry A. Etkin

Produced in the Educational Development System, MES, University of Minnesota

TEST LOCATIONS

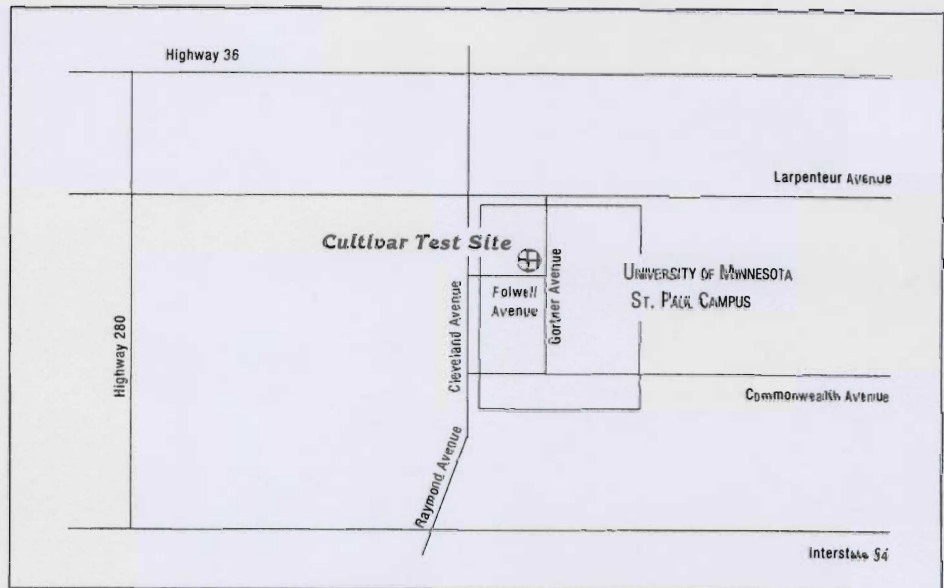
Department of Horticultural Science, St. Paul: The Garden

The horticulture teaching and display garden was established in 1977. As its primary function it serves as a learning laboratory for horticulture and landscape architecture students. But as the numbers of cultivars being displayed and tested has increased over the years, the site has become increasingly popular with the public.

The Garden is located at the north end of the St. Paul Campus, between the major cluster of campus buildings and the Minnesota Agricultural Experiment Station fields, at the intersection of Gortner and Folwell Avenues. Its approximately 1.5 acres are divided between a woodland garden, a prairie garden and an annual-perennial flower garden. In 1993, four different flower gardens were established: new plant trials, landscape design, annuals and herbs. There was also a lettuce trial garden in the spring with more than 80 cultivars planted.

Though the garden is open for inspection at all times, parking in the near vicinity is limited during times when classes are in session on the campus.

Most cultivars were grown from seeds or cuttings in on-site greenhouses, seeding dates varying with plant type. A few cultivars were purchased from local growers. In 1993, seedlings were transplanted to the field between May 16 and June 23. A 6-24-24 granular fertilizer was applied at planting. A mid-season 20-20-20 liquid fertilizer was applied. No pinch-



ing was practiced, but pest control, overhead irrigation and mechanical/hand/chemical weeding were applied as needed.

Construction of a cedar deck with a paved patio took place in the spring, and a keystone wall was installed in the summer. Trees and shrubs were also transplanted to the garden.

The 1993 St. Paul area growing season was 158 days, equalling the annual average.

The last spring frost was recorded on April 26 and the first fall frost on October 2. Rainfall between May 1 and September 30 was 28.31 inches, which was 9.64 inches above the annual average of 18.67 for that period. Temperatures were below average for this period.

The cool, wet season delayed both planting and plant development. The result, generally, was below average field performance in 1993.

West Central Experiment Station, Morris

From 1910 through 1963, the experiment station at Morris shared facilities with the West Central School of Agriculture. When that school became the University of Minnesota, Morris, the West Central Experiment Station moved to a new adjacent site.

Under the direction of the station horticulturist, plant trials that were begun before 1955 were continued at the new site. These included trials for small fruits, home garden vegetables, soil conservation plant materials and annual flower cultivars, and USDA single

row field windbreak test plantings.

More than 500 cultivars are on view at the West Central Experiment Station in a typical year. Program objectives include evaluating flower bloom, size, color, frost resistance and quality characteristics; evaluating plant growth, habit and disease characteristics; and identifying cultivars most suited for western Minnesota conditions.

All the cultivars were grown in on-site greenhouses, the seeding date varying with

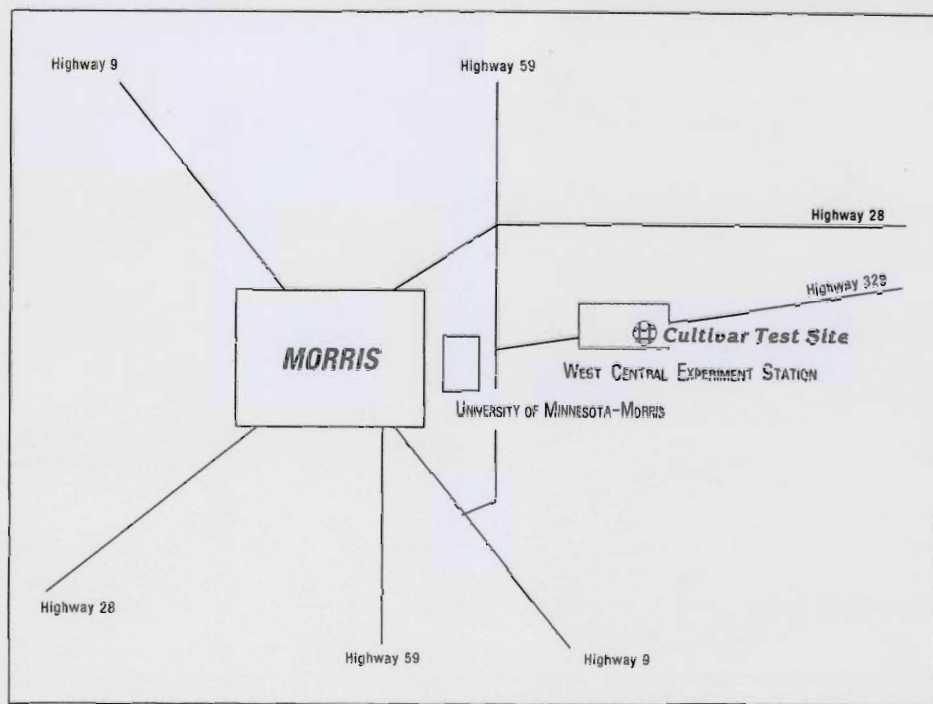
plant type. In 1993, seedlings were transplanted to the field between May 27 and June 4, into triangular shaped beds, ten plants per plot. Soil on the trial site is very fertile so little if any commercial fertilizer was used. Approximately every three years, animal manures are incorporated into the soil. No pinching was practiced, but pest control, overhead irrigation, herbicides and mechanical/hand weeding were applied as needed.

Greenhouse growth and development were normal, but field performance in 1993

was generally below average. Below average temperatures and above average rainfall during the season reduced growth and development, leading to average to below average results on some cultivars. It caused poor plant performance in most petunias, lisianthus, begonias, verbena, geraniums, celosia and vinca. Godetia and alyssum, however, provided very good color in the early growing season. Late season ratings for all impatiens, the *Nicotiana* 'Nicki Series' and *Salvia farinacea* 'Victoria Blue' were good.

The 1993 growing season was 138 days (average is 156 days), with the last spring frost on April 30 and the first fall frost on September 15. Rainfall between May 1 and September 30 was 24.45 inches, which was 8.89 inches above the 15.65 inch season average. Temperatures were above average in May but below average in June, July, August and September.

Annual events at the West Central Experiment Station include Visitors Day and Horticulture Night, both in July. For more information call (612) 589-1711 or fax (612) 589-4870.



North Central Experiment Station, Grand Rapids

In 1895 the state legislature provided funds to establish several agricultural experiment stations across Minnesota. One of the first was established in 1896 at Grand Rapids. Its first horticulturist came to the station in 1926. Early work focused on small fruits, vegetables, and an arboretum.

In recent years work has expanded to include blueberries and commercial vegetable and fruit crops. Management studies evaluate cultural practices for optimum fruit and vege-

table production in northern Minnesota. Annual flower trials began in 1965, and have become a focal point for public tours. More than 400 cultivars are reviewed each year. Program objectives include evaluating flower bloom, size, color, frost resistance and quality characteristics; evaluating plant growth, habit and disease characteristics; and identifying cultivars suited for northern Minnesota conditions.

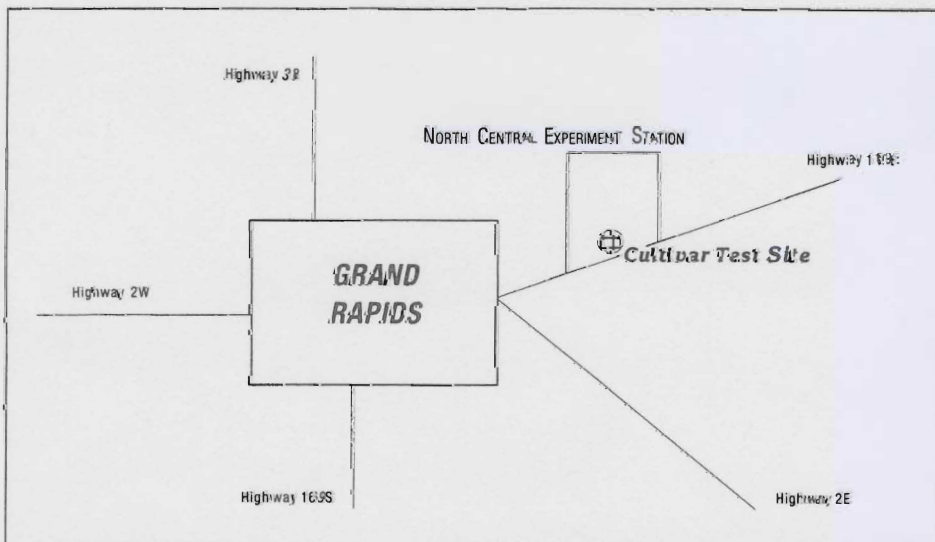
Cultivars are grown in on-site greenhouses; seeding date varies with plant type. In

1993, all seedlings were transplanted to the field on June 18 or 21, into rows four feet apart, with ten plants per plot on one foot centers. Fertilizer was broadcast at planting (350 pounds per acre of 20-10-10) as well as applied in a liquid starter drench (9-45-15). On July 15 and August 11, plots were banded with 33-0-0 at 120 pounds per acre. Insecticide was applied to marigolds and petunias (7/7, 7/20, and 8/10) to control aster leafhopper. Overhead irrigation and mechanical or hand weeding was applied as needed.

Greenhouse growth and development were normal. Overall field performance was average. The cool, wet season resulted in average plant growth but above average color development. Kale, snapdragons and pansies were among the better types late in the season. Pansies continued to bloom well until late October, after several hard freezes.

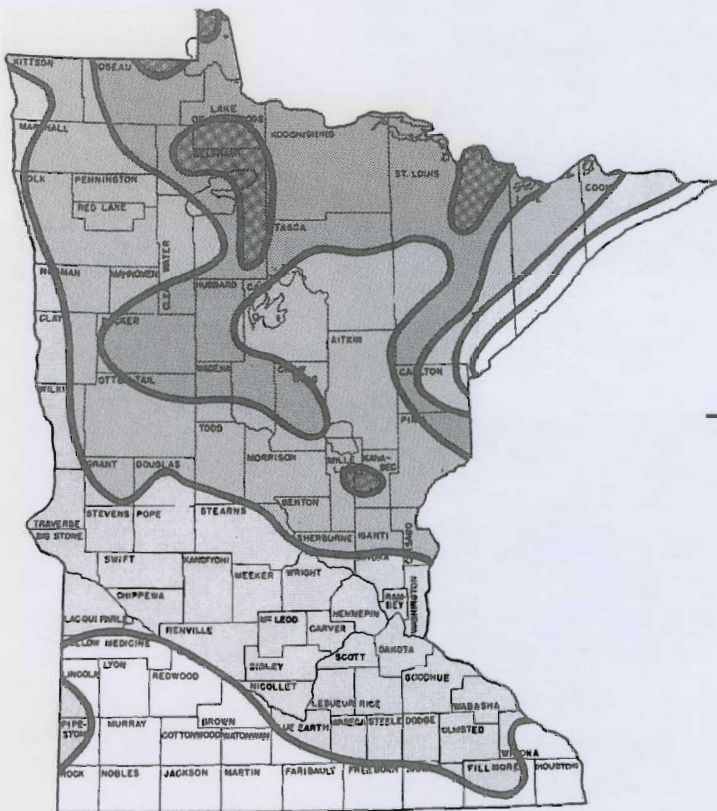
The 1993 growing season was 107 days long (average is 110 days) with the last spring frost on May 31 and the first fall frost on September 15. Rainfall between May 1 and September 30 was 21.0 inches, 3.1 inches above the average for the season. Temperatures were below average in June, July and September. Temperatures for August were near average.

Events at North Central Experiment Station include Horticulture Night and Bedding Plant Grower Day in August. For more information on either of these call (218) 327-4490 or fax (218) 327-4126.



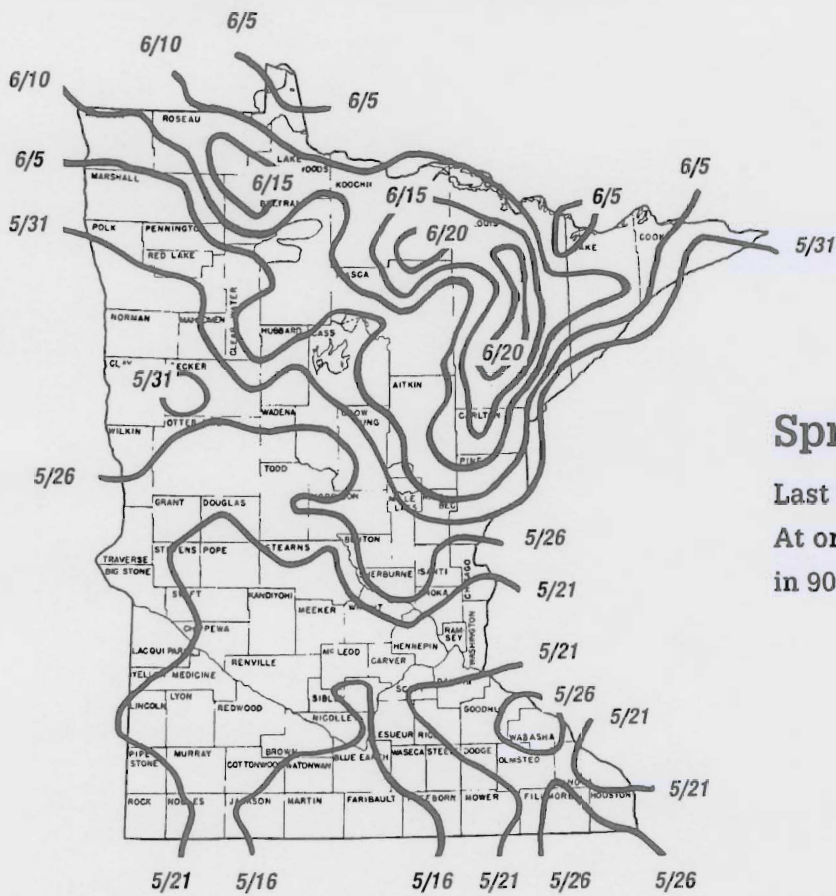
CLIMATOLOGICAL INFORMATION

United States Department of Agriculture Plant Hardiness Zones



Average Annual Minimum Air Temperature

| Degrees Celsius | USDA Zone | Degrees Fahrenheit |
|------------------|-----------|--------------------|
| - 40.0 to - 42.7 | 2b | - 40 to - 45 |
| - 37.3 to - 40.0 | 3a | - 35 to - 40 |
| - 34.5 to - 37.2 | 3b | - 30 to - 35 |
| - 31.7 to - 34.4 | 4a | - 25 to - 30 |
| - 28.9 to - 31.6 | 4b | - 20 to - 25 |

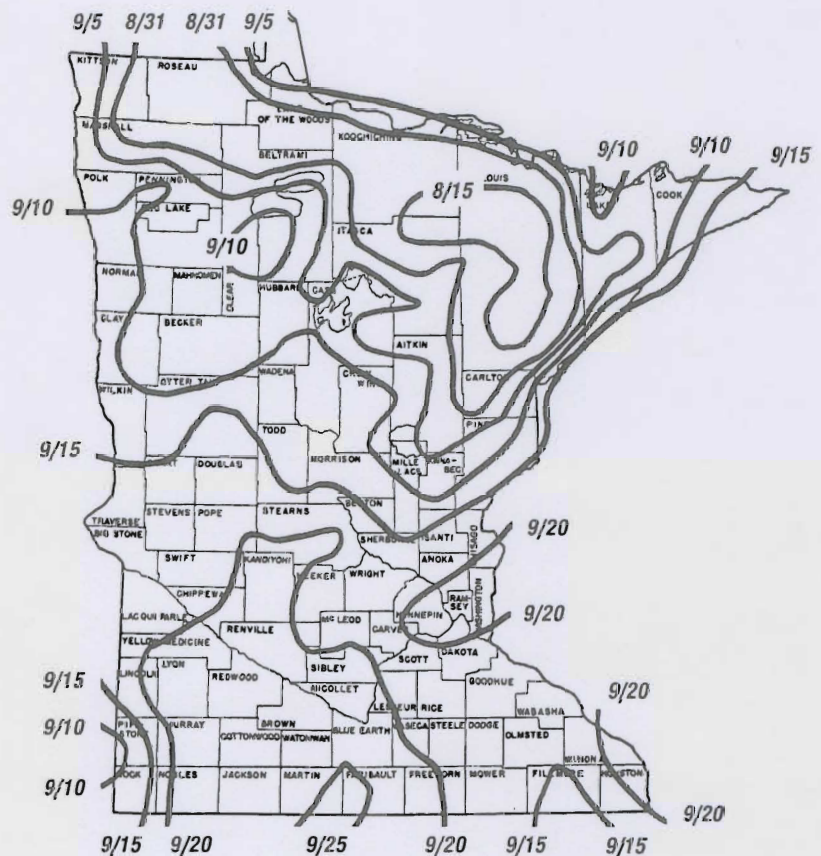


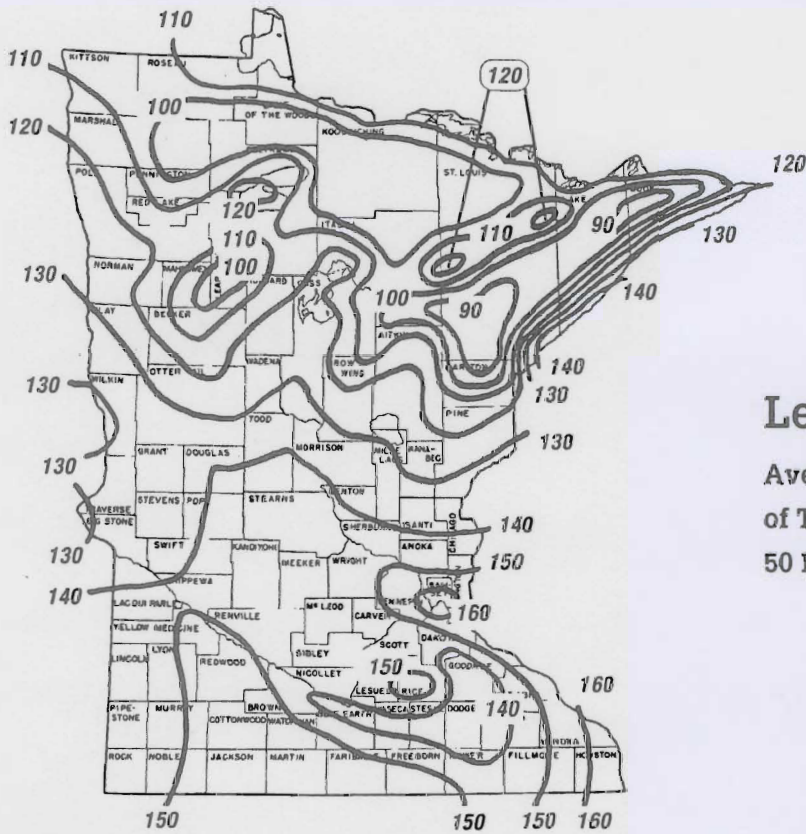
Spring Frost Date

Last Date of Minimum Temperature
At or Below Freezing (Last Frost)
in 90 Percent of Years

Fall Frost Date

Average Date of First Occurrence
in the Fall of a Temperature
Below Freezing (First Frost)
in 90 Percent of Years



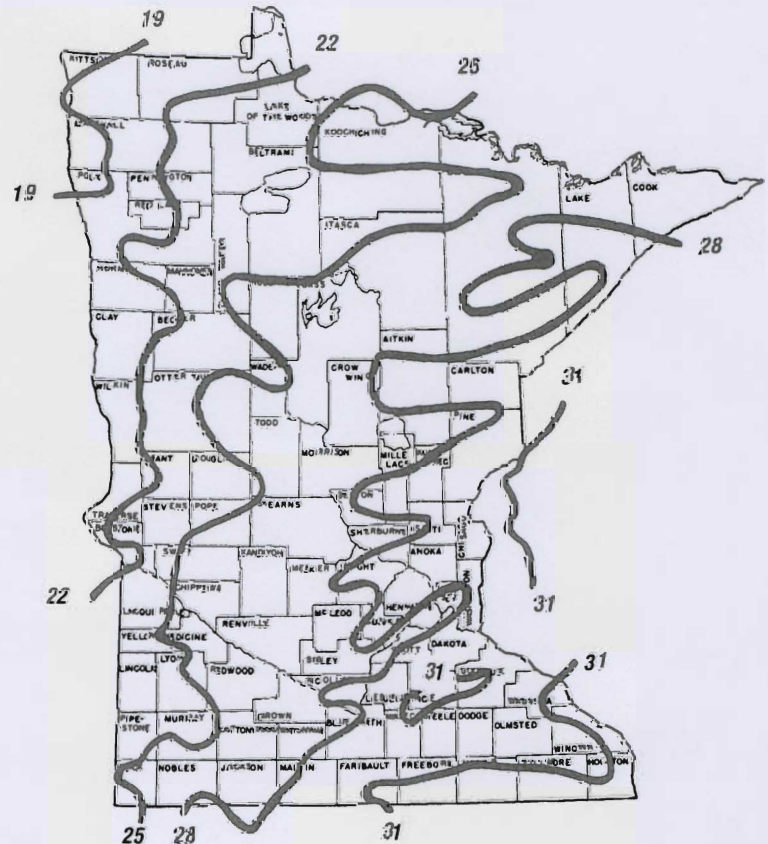


Length of Growing Season

Average Duration in Days of the Period Free of Temperatures at or Below Freezing in 50 Percent of Years

Annual Precipitation

Average Annual Precipitation, in Inches, Over 30 Years (Liquid Equivalent of All Precipitation Including Snow)



ALYSSUM

Sweet alyssum (*Lobularia maritima*), an old favorite in the flower garden, is the only cultivated species in this genus of Mediterranean herbs. Alyssum is very easy to grow from seed, and due to its exceptional frost tolerance can be sown outdoors in drifts in early spring. Seedlings will bloom less than six weeks from sowing, and quickly spread out to cover a foot of adjacent ground.

Dwarf forms of alyssum can be barely 3 inches tall, while the larger cultivars may approach 12 inches. Flower color ranges from white to pink to rosy red and lavender. Although the individual flowers are small, the dense clusters create great floral impact.

Most cultivars tested did very well at the Grand Rapids site, but less well at Morris

where wet soil was a problem in 1993.

Alyssum accounted for about 3 percent of the U.S. bedding plant crop in 1993, and 32 percent of bedding plant growers/marketers rated it an excellent item, despite its home-grown ease.

Table 1. Alyssum cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | Overall Quality Rating ⁴ | | | | |
|-------------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Carpet of Snow | NK | 5.0 | 4.0 | 15.0 | 11.0 | 0.6 | 4 | 4 | 8 | 8 | 4 |
| Cheers Rose | GR | 6.7 | 6.0 | 16.0 | 18.0 | 0.7 | 7 | 6 | 8 | 9 | 5 |
| Easter Basket Mixture | PM | 6.0 | 6.0 | 11.0 | 15.0 | 0.5 | 6 | 0 | 10 | 10 | 5 |
| Easter Bonnet Deep Pink | PM | 4.5 | 3.0 | 12.5 | 10.0 | 0.5 | 4 | 6 | 10 | 9 | 6 |
| Easter Bonnet Mix | PM | 6.5 | 5.0 | 15.0 | 15.0 | 0.9 | 6 | 6 | 10 | 10 | 5 |
| Easter Bonnet Violet | PM | 6.0 | 3.3 | 11.0 | 8.0 | 0.5 | 6 | 4 | 8 | 8 | 5 |
| Minimum | RS | 6.0 | 5.0 | 9.2 | 9.0 | 0.6 | 5 | 4 | 10 | 10 | 8 |
| New Carpet of Snow | JS | 12.0 | 12.0 | 22.5 | 30.0 | 0.5 | 8 | 7 | 9 | 9 | 7 |
| Pastel Mixture | CL | 7.0 | 6.0 | 12.0 | 12.0 | 0.5 | 6 | 0 | 10 | 10 | 5 |
| Royal Carpet | NK | 7.0 | 6.5 | 16.7 | 12.0 | 0.6 | 8 | 8 | 9 | 9 | 6 |
| Snowcloth | RS | 5.2 | 6.0 | 13.0 | 14.0 | 0.6 | 8 | 6 | 10 | 10 | 7 |
| Wonderland Mixed | TM | 6.5 | — | 17.7 | — | 0.5 | 8 | 8 | — | — | — |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of flower cluster; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

BEGONIA, FIBROUS

While the stronghold of fibrous begonia (*Begonia semperflorens-cultorum*) breeding is in Northern Europe, North American gardeners have adopted the plant as one of their favorites. The begonia is a compact plant that grows and flowers continuously from small plants through to the killing frost, and can even be brought indoors to provide flowering color through the winter.

Begonias can be grown from cuttings, but most commercial production is from seed. They also require light to germinate. Seeds are very fine, like dust, and can rarely be sown successfully directly into a garden. Seeds should be started in greenhouses at least eight weeks before the weather is warm enough to transplant outdoors.

The trend in begonia breeding is toward developing plants which flower earlier in packs. Colors include white, red and pink in fibrous begonias, plus orange, yellow and some with second color edging in tuberous forms (*Begonia x tuberhybrida*).

In general, the older narrow-petaled types of begonias have been supplanted in the market by cultivars with broad petals and more abundant and larger flowers. Foliage may be green, red or bronze.

Begonias can be grown in sun or open shade, but they do not compete well when interplanted between other annuals or perennials, or in the root areas of woody plants such as trees. Plant heights can range from 6 to 10

inches. Spaced properly, begonias produce solid beds or groups for garden landscapes, or for filled planters and window boxes.

Tuberous and fibrous begonias together accounted for 7.5 percent of the total U.S. bedding plant crop in 1993. Among growers/marketers, 40 percent rated them as excellent items.

Minnesota's begonia trials in 1993 focused on fibrous begonias and, at the Grand Rapids site, compared performance in sun and shade. Tested cultivars generally grew as well in either light condition, perhaps because of the unusually wet summer weather. Top performers at the St. Paul site were the Cocktail Series: 'Brandy,' 'Gin,' 'Vodka,' and 'Whiskey.'

Table 2. Fibrous begonia cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul and Grand Rapids.

| Cultivar | Seed Source ¹ | Exposure | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower width (inches) ³ | Overall Quality Rating ⁴ | | | | | |
|------------------------|--------------------------|----------|------------------------------------|----------|--------------|-----------------------|----------|--------------|------------------------------------|-------------------------------------|---|----------|----|--------------|---|
| | | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | |
| | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | | | | | | | |
| Brandy | EB | shade | — | 8.5 | 6.0 | — | 9.5 | 5.0 | 1.3 | — | — | 10 | 10 | 7 | 7 |
| Brandy | EB | sun | — | — | 7.0 | — | — | 6.0 | 0.5 | — | — | — | — | 7 | 6 |
| Gin | EB | shade | — | 11.0 | 6.0 | — | 10.5 | 6.0 | 1.3 | — | — | 10 | 10 | 8 | 9 |
| Lotto Rose | EB | shade | 7.0 | 12.0 | 7.0 | 5.0 | 10.5 | 8.5 | 1.9 | 4 | 4 | 7 | 8 | 7 | 9 |
| Lotto Scarlet | EB | shade | 7.5 | 11.5 | — | 5.5 | 13.0 | — | 2.5 | 4 | 4 | 8 | 10 | — | — |
| Minstrel Formula Mix. | SG | shade | — | — | 7.0 | — | — | 6.0 | 1.0 | — | — | — | — | 8 | 6 |
| Partydress | EB | shade | 9.0 | — | — | 7.5 | — | — | 1.0 | 6 | 6 | — | — | — | — |
| Partyflirt | EB | shade | 9.0 | — | 11.0 | 9.0 | — | 11.0 | 1.3 | 6 | 7 | — | — | 10 | 8 |
| Partyfriend | EB | shade | 8.0 | — | — | 5.5 | — | — | 1.0 | 5 | 6 | — | — | — | — |
| Rio Pink | SG | shade | 7.0 | — | — | 4.5 | — | — | 0.7 | 2 | 2 | — | — | — | — |
| Rio Rose | SG | shade | 7.0 | — | 8.0 | 5.0 | — | 5.0 | 0.9 | 6 | 5 | — | — | 7 | 7 |
| Rio Rose | SG | sun | — | — | 7.0 | — | — | 5.5 | 1.0 | — | — | — | — | 7 | 7 |
| Rio Scarlet | EB,SG | shade | 8.0 | — | 9.0 | 8.2 | — | 8.0 | 1.1 | 4 | 4 | — | — | 7 | 8 |
| Rio Scarlet | SG | sun | — | — | 8.0 | — | — | 7.0 | 0.5 | — | — | — | — | 8 | 7 |
| Rio White | SG | shade | 7.0 | — | — | 5.2 | — | — | 1.0 | 4 | 4 | — | — | — | — |
| Rum | EB | shade | — | 10.0 | — | — | 10.0 | — | 2.0 | — | — | 9 | 9 | — | — |
| Varsity Deep Rose Imp. | SG | shade | — | — | 6.0 | — | — | 5.0 | 1.0 | — | — | — | — | 6 | 6 |
| Varsity Deep Rose Imp. | SG | sun | — | — | 4.0 | — | — | 5.0 | 0.5 | — | — | — | — | 7 | 6 |
| Varsity Rose | SG | shade | 5.0 | 8.8 | 8.0 | 6.0 | 9.0 | 8.0 | 1.4 | 4 | 2 | 8 | 10 | 7 | 8 |
| Varsity Rose | SG | sun | — | — | 7.5 | — | — | 7.0 | 1.0 | — | — | — | — | 9 | 8 |
| Varsity White | SG | shade | 6.0 | — | — | 4.0 | — | — | 1.0 | 4 | 4 | — | — | — | — |
| Vision Bright Rose | EB | shade | 7.0 | — | 5.5 | 6.5 | — | 7.0 | 0.9 | 6 | 6 | — | — | 7 | 8 |
| Vision Bright Rose | EB | sun | — | — | 8.0 | — | — | 7.0 | 1.5 | — | — | — | — | 8 | 7 |
| Vision Pink | EB | shade | — | — | 8.0 | — | — | 8.0 | 1.0 | — | — | — | — | 7 | 8 |
| Vision Pink | EB | sun | — | — | 6.3 | — | — | 6.0 | 1.3 | — | — | — | — | 8 | 6 |
| Vision Red | EB | shade | 7.0 | — | — | 4.5 | — | — | 1.0 | 4 | 6 | — | — | — | — |
| Vision Rose | EB | shade | 7.0 | — | — | 5.0 | — | — | 1.0 | 4 | 2 | — | — | — | — |
| Vision Salmon | EB | shade | 6.5 | — | — | 5.0 | — | — | 1.0 | 4 | 4 | — | — | — | — |
| Vision White | EB | shade | 6.7 | — | — | 5.0 | — | — | 1.2 | 4 | 4 | — | — | — | — |
| Vodka | EB | shade | — | 9.8 | — | — | 10.0 | — | 1.8 | — | — | 10 | 10 | — | — |
| Whiskey | EB | shade | — | 9.0 | — | — | 10.0 | — | 1.8 | — | — | 10 | 10 | — | — |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

CHRYSANTHEMUM

Trials of chrysanthemum (now renamed *Dendranthema grandiflora*) are conducted at several sites throughout the state, including Morris, St. Paul and Grand Rapids. The trials are used to compare performance of both named cultivars and selections from the long-standing University of Minnesota breeding program. The tests identify cultivars most

suited to northern Midwest growing conditions. Plant breeders are concerned with cold hardiness, early flowering, flower color and plant form.

Chrysanthemum plants are largely propagated from cuttings. Early pinching encourages lateral branching which produces bushier

plants and more abundant flowers. Colors can be yellow, white, crimson, bronze, lavender, pink, rose or orange.

Field trial results for 1993 are presented for the Grand Rapids and Morris sites only.

Table 3. Chrysanthemum cultivars evaluated in 1993 at Grand Rapids and Morris.

| Cultivar | Height (inches) ¹ | Spread (inches) | Habit | Grand Rapids First Bloom | Flower Color | Flower Size (inches) ² | Overall Rating ³ | | | |
|----------------|---------------------------------|--------------------|--------------------|-----------------------------|------------------|--------------------------------------|-----------------------------|----------------------|---------------|----------------|
| | | | | | | | Grand Rapids 8/31 | Grand Rapids 9/27 | Morris 9/1 | Morris 9/27 |
| Aurora | 8 | 8 | Spreading | 8/12 | apricot | 1.2 | 3 | 2 | — | — |
| Autumn Beauty | 14 | 18 | Strongly spreading | 8/14 | orange | 2.8 | 7 | 7 | — | — |
| Autumn Fire | 20 | 24 | Upright | 9/01 | orange | 3.2 | 7 | 8 | — | — |
| Bit-O-Sunshine | 12 | 17 | Spreading | 8/14 | dark yellow | 2.8 | 9 | 10 | — | — |
| Burnt Copper | 8 | 12 | Cushion | 8/12 | bronze | 2.5 | 9 | 9 | 5 | 4 |
| Centennial Sun | 16 | 24 | Upright | 8/10 | dark yellow | 2.2 | 9 | 10 | 7 | 6 |
| Centerpiece | 18 | 19 | Strongly upright | 8/23 | lavender | 4.0 | 7 | 8 | 7 | 6 |
| Chippewa | 16 | 24 | Upright | 8/29 | dark lavender | 2.8 | 8 | 9 | — | — |
| Cortis Rice | 13 | 14 | Spreading | 8/31 | dark yellow | 3.2 | 5 | 6 | — | — |
| Cream Top | 14 | 20 | Spreading | 9/08 | cream | 2.5 | 5 | 5 | — | — |
| Dee Dee Ahrens | 12 | 14 | Upright | 9/01 | cream | 2.8 | 6 | 7 | — | — |
| Dr. Longley | 10 | 11 | Spreading | 8/13 | lavender | 3.0 | 7 | 7 | — | — |
| Gold Country | 14 | 14 | Strongly upright | 8/20 | dark yellow | 3.5 | 7 | 8 | 5 | 5 |
| Golden Jubilee | 13 | 12 | Spreading | 8/18 | golden yellow | 2.8 | 7 | 7 | — | — |
| Golden Star | 12 | 15 | Spreading | 8/23 | dark yellow | 2.8 | 6 | 6 | — | — |
| Goldstrike | 8 | 11 | Cushion | 8/13 | dark yellow | 2.5 | 7 | 8 | — | — |
| Grape Glow | 14 | 14 | Spreading | 8/13 | dark lavender | 3.5 | 9 | 10 | — | — |
| Harmony | 12 | 19 | Spreading | 8/08 | bronze | 2.5 | 7 | 7 | — | — |
| Harvest Bronze | 14 | 18 | Strongly spreading | 8/14 | orange | 3.0 | 6 | 8 | — | — |
| Homecoming | 12 | 19 | Strongly upright | 8/30 | apricot | 2.0 | 8 | 10 | — | — |
| Lemonsota | 12 | 11 | Cushion | 8/16 | pale yellow | 1.5 | 7 | 8 | 7 | 8 |
| Lindy | 15 | 20 | Strongly upright | 8/16 | pale lavender | 4.5 | 9 | 10 | 6 | 5 |
| Maroon Pride | 12 | 22 | Spreading | 8/14 | brick red | 3.0 | 8 | 9 | 9 | 8 |
| Mellow Moon | 12 | 12 | Strongly upright | 8/20 | cream | 3.5 | 8 | 8 | 7 | 5 |
| Mesabi | 14 | 23 | Spreading | 9/05 | bronze | 2.0 | 5 | 7 | — | — |
| Minn Autumn | 12 | 15 | Cushion | 8/15 | bronze | 3.5 | 8 | 10 | — | — |
| Minn Bronze | 12 | 14 | Cushion | 8/31 | bronze | 2.2 | 5 | 8 | — | — |
| Minnehaha | 10 | 15 | Spreading | 9/05 | apricot | 2.8 | 5 | 5 | — | — |
| Minn glow | 6 | 10 | Cushion | 9/07 | cream | 2.0 | 3 | 4 | — | — |
| Minn gopher | 8 | 12 | Cushion | 8/18 | brick red | 2.2 | 7 | 10 | 8 | 8 |
| Minn pink | 10 | 16 | Cushion | 9/02 | pinkish lavender | 2.5 | 7 | 8 | 4 | 6 |
| Minn queen | 11 | 16 | Cushion | 8/13 | rose pink | 2.2 | 8 | 9 | 5 | 6 |
| Minn rose | 10 | 12 | Cushion | 8/20 | rose pink | 1.2 | 5 | 5 | — | — |
| Minn ruby | 10 | 16 | Cushion | 8/17 | brick red | 3.0 | 9 | 10 | 5 | 4 |
| Minn white | 10 | 16 | Cushion | 8/14 | cream | 2.2 | 7 | 9 | 5 | 5 |
| Minn yellow | 10 | 16 | Cushion | 9/05 | dark yellow | 2.0 | 6 | 9 | — | — |
| Pipestone | 14 | 21 | Spreading | 8/08 | orange | 2.0 | 8 | 8 | — | — |
| Poise | 14 | 15 | Strongly upright | 8/28 | cream | 2.8 | 6 | 9 | — | — |
| Prairie Moon | 12 | 17 | Spreading | 8/12 | cream | 1.5 | 9 | 8 | — | — |
| Princess | 15 | 26 | Cushion | 8/20 | apricot | 3.0 | 6 | 7 | — | — |
| Purple Star | 12 | 11 | Spreading | 8/29 | dark lavender | 2.0 | 5 | 7 | — | — |
| Purple Waters | 14 | 14 | Spreading | 9/03 | dark lavender | 2.8 | 5 | 5 | — | — |
| Rose Blush | 14 | 17 | Spreading | 8/13 | rose pink | 3.5 | 8 | 9 | 4 | 4 |
| Rosy Glow | 15 | 13 | Upright | 8/15 | dark lavender | 3.2 | 9 | 10 | 6 | 6 |
| Royal Knight | 11 | 10 | Spreading | 9/06 | dark lavender | 2.8 | 3 | 4 | — | — |

Table 3 (continued). Chrysanthemum cultivars evaluated in 1993 at Grand Rapids and Morris.

| Cultivar | Height (inches) ¹ | Spread (inches) | Habit | Grand Rapids First Bloom | Flower Color | Flower Size (inches) ² | Overall Rating ³ | | | |
|--------------------|------------------------------|-----------------|--------------------|--------------------------|---------------|-----------------------------------|-----------------------------|-------------------|------------|-------------|
| | | | | | | | Grand Rapids 8/31 | Grand Rapids 9/27 | Morris 9/1 | Morris 9/27 |
| Royal Pomp | 12 | 12 | Strongly upright | 8/15 | dark lavender | 1.5 | 8 | 9 | — | — |
| Snowsota | 10 | 16 | Cushion | 8/14 | cream | 1.5 | 9 | 10 | 8 | 9 |
| Sunny Glow | 14 | 14 | Upright | 8/07 | orange | 2.5 | 9 | 9 | — | — |
| Superior | 14 | 16 | Spreading | 8/12 | bronze | 2.5 | 8 | 9 | — | — |
| Tenstrike | 8 | 14 | Cushion | 8/20 | lavender | 2.0 | 5 | 6 | — | — |
| Violet | 12 | 17 | Spreading | 8/14 | salmon red | 2.5 | 8 | 8 | — | — |
| Vulcan | 14 | 17 | Strongly spreading | 8/16 | salmon red | 2.5 | 8 | 9 | — | — |
| Wanda | 16 | 24 | Spreading | 8/14 | salmon red | 2.8 | 8 | 7 | — | — |
| Waterlily | 13 | 15 | Upright | 8/16 | white | 2.5 | 5 | 5 | — | — |
| Wayzata | 20 | 21 | Upright-spreading | 8/20 | dark yellow | 3.0 | 6 | 10 | — | — |
| Welcome | 7 | 5 | — | 8/15 | dark lavender | 1.5 | 3 | 2 | — | — |
| Wendy Ann | 14 | 15 | Strongly upright | 8/19 | cream yellow | 4.0 | 7 | 10 | — | — |
| White Daisy Mum | 12 | 10 | Upright | 8/23 | white | 3.2 | 5 | 5 | — | — |
| Yellow Glow | 16 | 18 | Upright | 8/15 | dark yellow | 2.5 | 8 | 9 | — | — |
| Yellow Ruth Lehman | 16 | 24 | Strongly spreading | 8/17 | yellow | 3.2 | 8 | 8 | — | — |
| Zonta | 11 | 13 | Cushion | 8/29 | orange | 2.2 | 7 | 9 | — | — |

¹ Mature height including flowers; site average. ² Width of flower head; value given is average across sites. ³ Rating on 1 to 10 scale for floral display and foliage quality.

DIANTHUS

Dianthus (*Dianthus chinensis*) is a plant growing in both popularity and the availability of new cultivars. It has a fragrant flower with clear, vibrant colors.

Dianthus flowers can usually be found in solids and combinations of white, pink, and red. Recent breeding efforts have extended its color range toward violet and purple. One good example of this is the 1992 All-American Selections 'Ideal Violet.'

To get a head start on blooming, seeds can be sown indoors or in a cold frame, or they can

be directly seeded into the garden. Seedlings are hardy and can be transplanted easily. Although it is considered a low maintenance plant, it sets seed quickly after flowering, so stems should be snipped off as soon as the first blooms begin to fade. This will encourage new growth that will produce more flowers.

A compact plant that grows to only 6 to 10 inches, *dianthus* requires sun or partial shade. It tolerates a wide range of temperatures, and can be depended on to bloom all summer and well into the fall. It requires a well drained soil and regular watering. It can withstand consid-

erable frost, and can even occasionally survive a Minnesota winter.

Dianthus held about 3 percent of the 1993 U.S. market for bedding plants, with 25 percent of bedding plant growers/marketers rating it an excellent item.

Dianthus F, 'Ideal Violet'

This cross between a Sweet William and a Chinese pink has strong stems and good weather tolerance. Unique purple flowers appear about 14 weeks after sowing. It does well in sunny locations with well-drained soil and needs little garden care. This was a 1992 All-America Selection.

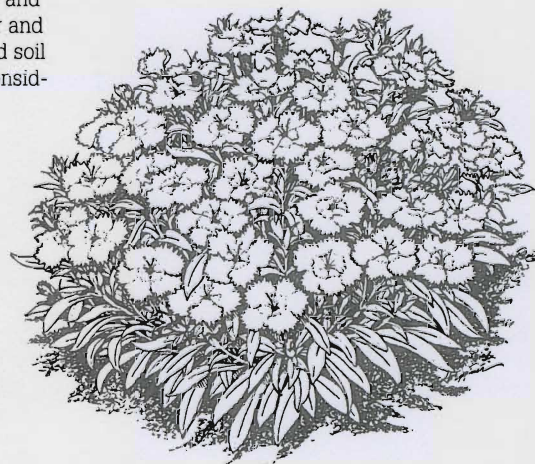


Table 4. Dianthus cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|--------------------------------|--------------------------|------------------------------------|--------|--------------|-----------------------|--------|--------------|-----------------------------------|-------------------------------------|-----|----------|------|--------------|------|---|
| | | Morris | StPaul | Grand Rapids | Morris | StPaul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | 10/5 | |
| B.E. ⁵ Carmine/Rose | BA | — | — | 12.0 | — | — | 14.0 | 1.5 | — | — | — | — | 8 | 9 | 7 |
| B.E. Crimson | BA | — | — | 11.0 | — | — | 12.0 | 1.5 | — | — | — | — | 9 | 8 | 7 |
| B.E. Crimson Picotee | BA | — | — | 12.0 | — | — | 15.0 | 1.0 | — | — | — | — | 10 | 9 | 7 |
| B.E. Deep Violet | BA | — | — | 10.5 | — | — | 14.0 | 1.0 | — | — | — | — | 9 | 9 | 6 |
| B.E. Raspberry | BA | — | — | 10.0 | — | — | 13.0 | 1.0 | — | — | — | — | 10 | 10 | 7 |
| B.E. Violet Picotee | BA | — | — | 12.0 | — | — | 12.0 | 1.0 | — | — | — | — | 9 | 9 | 6 |
| B.E. Violet/Purple | BA | — | — | 11.0 | — | — | 13.0 | 1.0 | — | — | — | — | 10 | 10 | 7 |
| Festival Picotee | TM | — | — | 12.0 | — | — | 12.0 | 1.0 | — | — | — | — | 9 | 10 | 7 |
| Ideal Violet | AAS | 9.2 | 6.5 | 11.0 | 13.7 | 9.0 | 11.5 | 1.3 | 6 | 6 | 9 | 7 | 10 | 10 | 7 |
| Oriental Carpet | AT | 7.7 | 8.5 | 7.0 | 10.2 | 10.5 | 10.0 | 1.4 | 6 | 4 | 8 | 8 | 7 | 7 | 7 |
| Primadonna | EB | 22.0 | 23.0 | 22.0 | 10.5 | 16.5 | 16.0 | 1.4 | 5 | 6 | 10 | 9 | 5 | 8 | 6 |
| Princess Pink | GO | 8.0 | 9.5 | 11.0 | 12.2 | 10.0 | 14.0 | 1.7 | 7 | 6 | 9 | 6 | 9 | 9 | 7 |
| Raspberry Parfait | GO | 7.7 | 9.0 | 10.0 | 10.0 | 9.0 | 10.0 | 1.5 | 8 | 4 | 9 | 6 | 6 | 8 | 5 |
| Snow Fire | AT | 9.0 | 9.5 | 10.0 | 8.5 | 9.5 | 10.0 | 1.8 | 6 | 5 | 9 | 6 | 8 | 8 | 5 |
| Strawberry Parfait | GO | 8.7 | 8.0 | 7.0 | 12.2 | 8.5 | 10.5 | 1.4 | 6 | 5 | 10 | 7 | 8 | 8 | 5 |
| Telstar Mix | AT | — | — | 10.0 | — | — | 10.0 | 1.0 | — | — | — | — | 10 | 10 | 6 |
| Telstar Picotee | AAS,AT | 7.5 | 9.5 | 9.0 | 10.5 | 12.5 | 11.0 | 1.1 | 8 | 5 | 10 | 8 | 10 | 10 | 7 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality. ⁵ B.E. = Ball Experimental.

GERANIUM

Geraniums (*Pelargonium hortorum*) originated in South Africa, and were probably grown in Dutch settlers' gardens as early as 1652. By 1690, they arrived in England and became favorite garden plants. Geraniums came to the U.S. in 1786 when Thomas Jefferson sent some home from France. From then to the present, geraniums have grown in garden popularity and in diversity: about 280 species and 10,000 cultivars are known to exist.

For many years, bedding geraniums were primarily grown from cuttings taken from over-wintered stock. Now high quality seed grown hybrids are available in many colors and heights. There generally appears to be little overall difference in quality between seed and cutting types.

Geranium flowers come in white, pink, red, salmon, lavender, orange and fuchsia. The true orange is found with 'Orange Appeal,' a 1991 Fleuroselect Gold Medal Winner. New cultivars like 'Freckles' even offer bicolored flowers. Whether individual blossoms are

single or double, they are borne in large clusters or heads.

Plant height ranges from ten to 30 inches. Recent breeding trends in bedding geraniums have been toward shorter plants that hold their heads well above the foliage. Other popular types are bred for hanging baskets and feature long, trailing stems.

Geranium seed should be sown in moist medium at temperatures below 76°F. Under these conditions, germination is as rapid as seven days. Seed should be started in Minnesota in mid-January to produce stocky, budded transplants for spring. Optimum growth and earlier flowering require supplementary lighting equivalent to 16 hour days. Although day length per se does not affect flower initiation, total amount of light does. Cooler day temperatures will result in shorter, stockier plants with more flower heads. Stem elongation increases as day temperature increases.

Outdoors, geraniums require full sun

and well drained soil for best growth and full flowering. Transplants should not be set out until frost danger has passed and soil has warmed. Over fertilizing will reduce flowering. Dead flower heads should be removed to avoid *Botrytis* fungus problems.

Geraniums, both cutting and seed combined, accounted for about 22 percent of the total bedding plant crop in 1993, and were a distant second after impatiens in overall popularity among consumers. Bedding plant growers/marketers largely (63 percent) rated cutting geraniums as an excellent or good item; 33 percent felt the same about seed geraniums.

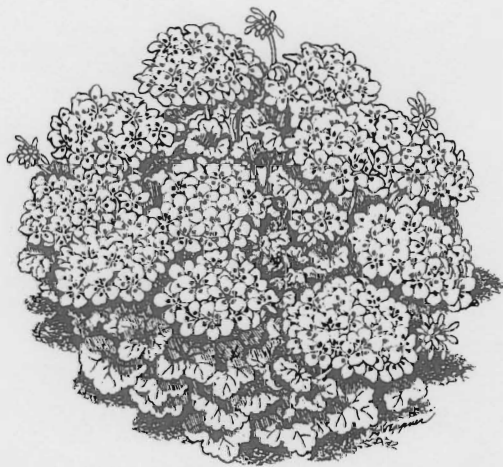
Geraniums did not perform as well in the Minnesota 1993 trials as in other years. The unusually wet and cool weather contributed to poorer growth than expected. Some of the best cultivars grown at the St. Paul site included 'Americana Red,' 'Orbit Red,' 'Orbit Rose,' and 'Orbit Violet.'

Table 5. Geranium cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|------------------------|---------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|------|----------|------|--------------|-----|------|
| | | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | 10/5 |
| Americana Cherry Red | cutting | GCG,GO | 12.0 | 12.0 | 14.0 | 14 | 15.0 | 18.0 | 3.9 | 6 | 8 | 9 | 8 | 8 | 8 | 4 |
| Americana Cherry Rose | cutting | GCG,GO | 10.0 | — | 12.0 | 13.0 | — | 13 | 3.5 | 6 | 6 | — | — | 8 | 9 | 4 |
| Americana Red | cutting | GCG,GO | 14.0 | 16.0 | 12.0 | 16 | 18.0 | 20.0 | 4.4 | 7 | 8 | 10 | 10 | 8 | 8 | 5 |
| Americana Violet | cutting | GCG,GO | 9.0 | 11.0 | 10.0 | 11 | 12.0 | 14.0 | 3.7 | 5 | 4 | 9 | 8 | 8 | 8 | 4 |
| Atlantis | cutting | MB | 8.7 | — | — | 8.0 | — | — | 3.7 | 4 | 3 | — | — | — | — | — |
| Blues | cutting | MB | 14.0 | — | 12.0 | 12.0 | — | 14.0 | 3.9 | 4 | 5 | — | — | 9 | 6 | 4 |
| Brazil | cutting | MB | 11.0 | 16.0 | 11.0 | 12.2 | 14.0 | 16.0 | 4.1 | 4 | 4 | 6 | 8 | 9 | 7 | 5 |
| Eclipse Red | cutting | GCG | — | 17.0 | 14.0 | — | 16.0 | 15.0 | 4.8 | — | — | 8 | 9 | 9 | 8 | 4 |
| Jazz | cutting | MB | 10.0 | 13.5 | 11.3 | 9.7 | 12.5 | 16.0 | 4.2 | 4 | 5 | 6 | 10 | 8 | 8 | 5 |
| Kardinal | cutting | MB | 16.0 | 20.0 | 14.0 | 16.2 | 18.0 | 20.0 | 3.7 | 4 | 5 | 8 | 9 | 8 | 8 | 5 |
| Pac Melody | cutting | MB | 12.0 | 13.5 | 12.0 | 12.7 | 13.5 | 19.0 | 3.6 | 6 | 6 | 8 | 9 | 9 | 9 | 4 |
| Pac Sassy | cutting | MB | — | 14.0 | 11.5 | — | 14.0 | 14.0 | 3.9 | — | — | 8 | 8 | 8 | 6 | 4 |
| Rio | cutting | MB | — | 14.0 | 13.8 | — | 14.0 | 19.0 | 4.0 | — | — | 6 | 8 | 8 | 9 | 5 |
| Sunbelt Dark Red | cutting | MB | 15.0 | — | — | 17.5 | — | — | 4.5 | 6 | 6 | — | — | — | — | — |
| Tango | cutting | MB | 11.0 | 12.0 | 12.0 | 10.5 | 11.5 | 17.0 | 4.1 | 6 | 5 | 6 | 8 | 9 | 10 | 5 |
| Avanti Lilac Rose | seed | CL | — | 14.5 | 13.0 | — | 15.5 | 21.0 | 4.3 | — | — | 9 | 10 | 9 | 8 | 5 |
| Avanti Rose | seed | SG | — | — | 11.0 | — | — | 17.0 | 5.0 | — | — | — | — | 8 | 7 | 4 |
| Avanti Scarlet | seed | SG | — | 10.0 | 11.0 | — | 13.0 | 19.0 | 3.4 | — | — | 7 | 7 | 9 | 9 | 5 |
| Ball Experimental Red | seed | GO | — | — | 15.0 | — | — | 16.0 | 6.0 | — | — | — | — | 9 | 7 | 4 |
| Ball Experimental Rose | seed | BA | — | — | 14.0 | — | — | 14.0 | 5.0 | — | — | — | — | 9 | 7 | 4 |
| Dynamo Deep Scarlet | seed | GO,SG | 13.0 | 11.0 | 17.0 | 11.7 | 13.5 | 19.0 | 3.6 | 4 | 4 | 8 | 8 | 8 | 8 | 4 |
| Eclipse Red | seed | GO | 12.0 | — | — | 12.5 | — | — | 4.0 | 6 | 5 | — | — | — | — | — |
| Elite Cherry | seed | GO | 13.0 | 13.8 | — | 14.0 | 12.5 | — | 3.0 | 4 | 5 | 9 | 8 | — | — | — |
| Elite Pink | seed | GO | 12.0 | — | — | 13.5 | — | — | 3.0 | 6 | 6 | — | — | — | — | — |
| Elite Red | seed | GO | 15.0 | 12.0 | — | 15.0 | 14.5 | — | 3.1 | 5 | 6 | 6 | 10 | — | — | — |
| Elite Scarlet | seed | GO,TM | 9.7 | 12.5 | 15.0 | 9.0 | 17.0 | 14.0 | 3.9 | 4 | 5 | 9 | 8 | 9 | 8 | 5 |
| Freckles | seed | AAS | 10.0 | 13.0 | 11.0 | 10.5 | 14.0 | 14.0 | 3.4 | 5 | 4 | 10 | 9 | 13 | 10 | 4 |
| Multibloom Bright Rose | seed | GO,SG | — | 16.0 | 15.0 | — | 13.0 | 17.0 | 3.9 | — | — | 9 | 10 | 9 | 9 | 5 |
| Multibloom Lavender | seed | GO | 12.8 | 11.5 | 11.0 | 14.2 | 14.5 | 13.0 | 3.8 | 6 | 5 | 8 | 8 | 9 | 8 | 5 |
| Multibloom Pink | seed | GO | 13.0 | — | — | 14.5 | — | — | 3.0 | 5 | 4 | — | — | — | — | — |
| Multibloom Red | seed | GO | 11.0 | 10.0 | — | 11.0 | 13.5 | — | 3.1 | 4 | 3 | 7 | 10 | — | — | — |
| Multibloom Scarlet | seed | GO | 12.0 | 12.0 | 14.0 | 12.0 | 12.5 | 15.0 | 3.2 | 4 | 4 | 9 | 10 | 10 | 7 | 4 |
| Multibloom Scarlet Eye | seed | GO | 14.0 | — | 12.0 | 14.0 | — | 13.0 | 2.2 | 4 | 2 | 7 | 9 | 8 | 8 | 4 |
| Orbit Appleblossom | seed | GO | 10.0 | 15.0 | — | 12.5 | 12.5 | — | 3.4 | 4 | 4 | 10 | 9 | — | — | — |
| Orbit Cardinal | seed | BA,GO | 12.8 | 15.0 | 14.8 | 12.7 | 14.0 | 16.0 | 3.9 | 4 | 6 | 3 | 5 | 8 | 8 | 5 |
| Orbit Cherry | seed | GO | 14.0 | 13.8 | — | 10.0 | 16.0 | — | 4.0 | 8 | 4 | 10 | 6 | — | — | — |
| Orbit Coral | seed | GO | — | 10.5 | — | — | 20.0 | — | 3.5 | — | — | 4 | 4 | — | — | — |
| Orbit Glow | seed | GO | — | 12.0 | 19.0 | — | 20.5 | 22.0 | 3.6 | — | — | 7 | 7 | 8 | 9 | 3 |
| Orbit Hot Pink | seed | GO | 13.0 | — | 16.0 | 12.7 | — | 15.0 | 3.2 | 7 | 6 | — | — | 8 | 8 | 5 |
| Orbit Orchid | seed | GO | — | — | 11.0 | — | — | 16.0 | 4.0 | — | — | — | — | 8 | 8 | 4 |
| Orbit Pink | seed | GO | 12.0 | — | 15.0 | 12.7 | — | 14.0 | 3.8 | 6 | 6 | — | — | 8 | 9 | 5 |
| Orbit Red | seed | GO,SG | 17.0 | 22.0 | 16.0 | 13.7 | 16.0 | 18.0 | 3.4 | 7 | 7 | 10 | 10 | 7 | 8 | 6 |
| Orbit Rose | seed | GO | 12.0 | 17.5 | 16.0 | 14.5 | 10.0 | 17.0 | 4.0 | 7 | 7 | 10 | 10 | 13 | 9 | 5 |
| Orbit Salmon | seed | GO | — | 11.0 | — | — | 13.0 | — | 2.8 | — | — | 5 | 8 | — | — | — |
| Orbit Scarlet | seed | CL,GO | 14.0 | 13.0 | 16.0 | 13.0 | 15.0 | 17.0 | 4.1 | 5 | 5 | 10 | 8 | 8 | 8 | 5 |

Table 5 (continued). Geranium cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower width (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|-------------------------|------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|------------------------------------|-------------------------------------|-----|----------|------|--------------|------|---|
| | | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | 10/5 | |
| Orbit Scarlet Eyed | seed | GO | 15.0 | 14.0 | 17.0 | 11.2 | 16.0 | 17.5 | 3.6 | 7 | 5 | 7 | 8 | 8 | 9 | 5 |
| Orbit Scarlet Improved | seed | CL | — | — | 14.0 | — | — | 19.0 | 4.5 | — | — | — | — | 8 | 9 | 4 |
| Orbit Violet | seed | GO,TM | 12.0 | 15.5 | 13.0 | 12.2 | 11.0 | 15.0 | 3.4 | 4 | 4 | 10 | 10 | 8 | 9 | 5 |
| Orbit White | seed | GO | — | 10.0 | — | — | 15.0 | — | 2.5 | — | — | 5 | 8 | — | — | — |
| Pinto Bicolor | seed | GO | — | 15.0 | 17.0 | — | 15.0 | 17.0 | 4.4 | — | — | 8 | 9 | 8 | 9 | 5 |
| Pinto Quicksilver | seed | SG | 15.0 | 17.5 | 14.0 | 15.5 | 20.0 | 18.0 | 3.2 | 7 | 6 | 10 | 8 | 9 | 9 | 5 |
| Pinto Red | seed | GO,SG | 12.0 | 12.5 | 18.0 | 16.0 | 13.0 | 16.0 | 3.7 | 5 | 6 | 5 | 8 | 9 | 9 | 6 |
| Pinto Rose | seed | SG | — | 18.5 | 14.0 | — | 16.0 | 20.0 | 4.3 | — | — | 9 | 9 | 9 | 9 | 5 |
| Pinto Scarlet | seed | GO,SG | 13.0 | 18.0 | 17.0 | 14.0 | 19.0 | 15.0 | 4.2 | 4 | 6 | 8 | 9 | 8 | 9 | 6 |
| Pinto Violet | seed | SG | 14.0 | 15.5 | 12.0 | 13.5 | 16.0 | 19.0 | 3.1 | 6 | 6 | 10 | 8 | 8 | 8 | 6 |
| Ringo 2000 Deep Rose | seed | SG | — | 11.0 | 14.0 | — | 14.0 | 17.0 | 3.5 | — | — | 10 | 8 | 8 | 7 | 5 |
| Ringo 2000 Deep Scarlet | seed | SG | 14.0 | 13.5 | 12.5 | 14.0 | 15.5 | 15.0 | 3.5 | 4 | 5 | 9 | 8 | 8 | 8 | 4 |
| Saturn Hot Pink | seed | GO,GR | 13.0 | — | 14.0 | 17.5 | — | 15.0 | 4.1 | 7 | 7 | — | — | 7 | 9 | 6 |



Geranium 'Freckles'

Rose freckles on pink petals give a unique look to this vigorous geranium. Flower heads are large and held above the foliage for good effect. Expect 12- to 15-inch plants with continuous flower color. This was a 1991 All-America Selection.

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of flower cluster; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

HERBS

New to Minnesota's cultivar trials this year is a collection of herbs, grown both for their useful properties and for their ornamental qualities. Herbs were evaluated strictly on their overall appearance, including flowers if appropriate.

Dill 'Farnleaf' was an All American Selection in 1992, as were the basil 'Purple Ruffles' (in 1987) and 'Dark Opal' (in 1962). This year, the lavender 'Lady' joins that group as a 1994 selection.

'Lady' is actually a perennial that is hardy with protection to USDA zone 5. It will flower the first year from seed. It germinates easily in light in 14 to 20 days, and should be sown four to six months before planting outdoors in a sunny location.

Herbs generally tend to be easy-care plants that offer unusual scents and textures to the garden. Most are started from seed, although some are best from divisions or stem cuttings. All types grown in the 1993 Minne-

sota trials do well in a sunny location with average to dry soil. A slightly dry soil helps to bring out strong fragrances and flavors in many herbs.

Basil, represented by seven different cultivars in 1993, may be the most widely cultivated herb in American gardens. Chiefly used in cooking, basil needs average soil and moisture to grow outdoors, but is very sensitive to frost. Seeds are easily started indoors, and seedlings grow rapidly, reaching full bloom in 12 weeks.

Basil is grown for its tasty leaves, not its small flowers, so pinching is required to keep the plant vegetative. Harvest of leaves for culinary use can begin as early as eight weeks after sowing.

Basil is available in many "flavors" including lemon, anise, cinnamon, and the familiar pesto type. Leaves may be green or purple, but all basil, regardless of flavor or color, are edible.

Lavender 'Lady'

This 1994 All-America Selection is an improved aromatic herb with dense 10-inch spikes of deep purple blossoms. Its buds, blossoms and soft grey-green foliage share the same clean fragrance.

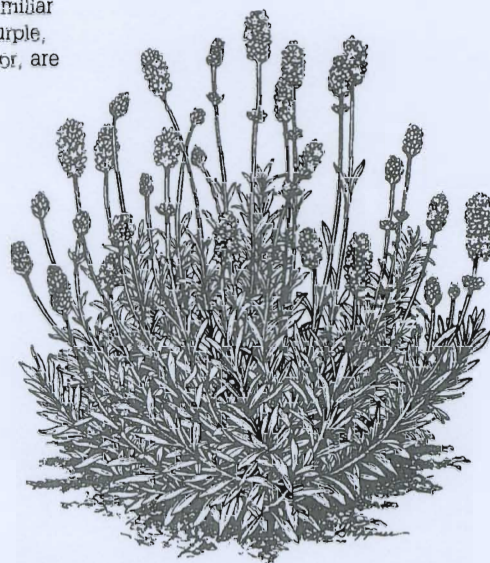


Table 6. Herb cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Common Name | Genus | Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | |
|---------------------|-------------------------------|-----------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|-------------------|-------------------|------------------|
| | | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris 8/11 | Grand Rapids 9/14 | Grand Rapids 8/19 | Grand Rapids 9/7 |
| Basil | <i>Ocimum basilicum</i> | Dark Opal | LB | 16.0 | — | 17.0 | — | n/a | 8 | 2 | — | — |
| Basil | <i>Ocimum basilicum</i> | Greek Miniature | SH | 12.0 | 7.0 | 16.0 | 15.0 | n/a | 4 | 2 | 10 | 8 |
| Basil | <i>Ocimum basilicum</i> | Green Ruffles | SK | 5.2 | — | 5.0 | — | n/a | 2 | 2 | — | — |
| Basil | <i>Ocimum basilicum</i> | Lemon | SK | 17.0 | — | 20.0 | — | n/a | 8 | 8 | — | — |
| Basil | <i>Ocimum basilicum</i> | Purple Ruffles | PM | 9.2 | 6.0 | 7.7 | 10.0 | n/a | 2 | 2 | 6 | 6 |
| Basil | <i>Ocimum basilicum</i> | Spicy Bush | JS | 11.0 | 9.0 | 15.0 | 18.5 | n/a | 6 | 6 | 10 | 10 |
| Basil | <i>Ocimum basilicum</i> | Spicy Globe | NK | 8.2 | 9.0 | 7.7 | 15.0 | n/a | 2 | 2 | 4 | 8 |
| Borage | <i>Borago officinalis</i> | — | SH, TM | — | 19.9 | — | 27.8 | 7.0 | — | — | 9 | 6 |
| Cilantro, Coriander | <i>Corum carvi</i> | — | JS, SK, TM | 33.5 | 20.0 | 18.5 | 18.5 | n/a | 6 | 2 | 4 | 6 |
| Dill | <i>Anethum graveolens</i> | Fernleaf | AAS, JS, PM | 22.0 | 19.0 | 20.0 | 15.0 | 3.4 | 6 | 2 | 5 | 9 |
| German Chamomile | <i>Matricaria chamomilla</i> | — | JS | — | 15.0 | — | 6.0 | 4.0 | — | — | 7 | 5 |
| Lavender | <i>Levandula angustifolia</i> | Lady | AAS | 7.0 | 5.0 | 6.5 | 3.3 | n/a | 1 | 1 | 3 | 4 |
| Perilla | <i>Perilla frutescens</i> | Shiso Red | JS | 14.0 | 38.5 | 8.0 | 27.0 | n/a | 4 | 6 | 10 | 8 |
| Sweet Annie | <i>Artemisia annua</i> | — | JS | 64.0 | 45.0 | 50.0 | 30.0 | n/a | 8 | 8 | 10 | 10 |
| Sweet Marjoram | <i>Origanum majorana</i> | — | JS | 10.0 | 10.0 | 9.0 | 20.0 | n/a | 6 | 6 | 4 | 8 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of flower head or cluster; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

IMPATIENS, NEW GUINEA

During the 1970s, a new type of impatiens was discovered in the flora of southeast Asia and Australia. It had large, lustrous flowers with variegated stems and foliage. A number of different species and types were brought to the U.S., and hybridization resulted in the

New Guinea impatiens. Since first offered for sale in 1972, there has been a steady and increasing demand for these exotic plants.

New Guinea impatiens are relatively easy to grow from cuttings, the general method of

propagation. However, many varieties are patented or protected, and should not be propagated except by a licensed propagator.

Commercially obtained cuttings will fit a 5-inch pot with flowers in two months. Some

new strains are propagated from seed, and more work is going on in that area. Seeds of New Guinea impatiens take a bit longer to germinate than the standard type.

New Guinea impatiens are susceptible to root rots, so do not overwater. They also have a low nutritional requirement and are easily damaged by elevated levels of fertilizer. Plants grow and flower best when day and night temperatures are between 68° and 77° F. Unlike most annuals, pinching does not promote bushy growth. But bright light is a must

for stocky, healthy plants. These features make New Guinea impatiens an easy-care annual for the home gardener, who especially appreciates their greater tolerance of heat and sun than standard impatiens cultivars.

New cultivars are being released commercially every year, and the University of Minnesota has an on-going breeding project as well. In the Minnesota trials, named cultivars of both seed and cutting types were grown both in sun and shade. Performance in shade tended to be better, but only slightly, indicating

the potential of New Guinea impatiens as a light shade annual in northern sites.

Although New Guinea impatiens have only been grown commercially for 20 years, they already constitute more than 5 percent of the bedding crop in the U.S., with 51 percent of bedding plant growers and marketers rating them as excellent sales items. They are also among the top ten best selling annuals.

Table 8. New Guinea impatiens cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Exposure | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | |
|------------------|---------|--------------------------|----------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|------|----------|------|--------------|-----|
| | | | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | |
| | | | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 |
| Bull Anna | cutting | MB | shade | 10.0 | 11.0 | 8.0 | 16.0 | 14.0 | 9.0 | 1.8 | 7 | 6 | 9 | 9 | 9 | 8 |
| Bull Anna | cutting | MB | sun | 9.0 | — | 8.0 | 10.5 | — | 10.0 | 1.3 | 7 | 6 | — | — | 9 | 6 |
| Bull Doerte | cutting | MB | shade | 11.0 | 10.5 | 8.0 | 17.0 | 11.5 | 10.0 | 1.9 | 8 | 7 | 10 | 9 | 8 | 7 |
| Bull Doerte | cutting | MB | sun | 8.7 | — | 8.0 | 12.0 | — | 11.0 | 1.6 | 7 | 7 | — | — | 7 | 8 |
| Bull Inge | cutting | MB | shade | 8.0 | 10.0 | 6.0 | 11.0 | 14.0 | 8.0 | 1.6 | 6 | 5 | 10 | 9 | 7 | 6 |
| Bull Inge | cutting | MB | sun | 7.0 | — | 6.3 | 10.0 | — | 9.0 | 1.3 | 7 | 6 | — | — | 7 | 6 |
| Bull Rosemarie | cutting | MB | shade | 10.0 | 10.8 | 6.0 | 13.5 | 12.0 | 10.0 | 1.7 | 7 | 6 | 10 | 9 | 7 | 6 |
| Bull Rosemarie | cutting | MB | sun | 9.0 | — | 5.0 | 9.0 | — | 9.0 | 1.4 | 7 | 6 | — | — | 7 | 4 |
| Danziger Dangkal | cutting | MB | shade | 8.5 | 14.5 | 7.0 | 13.5 | 9.5 | 11.0 | 1.8 | 7 | 7 | 9 | 10 | 10 | 9 |
| Danziger Dangkal | cutting | MB | sun | — | — | 7.8 | — | — | 10.0 | 1.5 | — | — | — | — | 9 | 8 |



Impatiens 'Tango'

The first impatiens hybrid to combine both *I. wallerana* and New Guinea germplasm, 'Tango' bears large bright orange blossoms on well branched, 18- to 24-inch plants. 'Tango' thrives outdoors in full morning sunlight. This was a 1989 All-America Selection.

| | | | | | | | | | | | | | | | | |
|---------------------------|---------|----|-------|-----|------|-----|------|------|------|-----|---|---|---|----|---|---|
| Danziger Flamenco | cutting | MB | shade | 8.5 | 13.0 | 7.0 | 15.5 | 11.5 | 13.0 | 2.3 | 8 | 7 | 9 | 10 | 8 | 7 |
| Danziger Flamenco | cutting | MB | sun | 8.7 | — | 8.5 | 12.5 | — | 12.0 | 1.5 | 7 | 6 | — | — | 6 | 8 |
| Danziger Lambada | cutting | MB | shade | 8.0 | 11.8 | 7.0 | 12.0 | 12.5 | 13.0 | 1.8 | 8 | 7 | 9 | 8 | 6 | 6 |
| Danziger Lambada | cutting | MB | sun | 9.0 | — | 8.5 | 14.2 | — | 7.0 | 2.1 | 8 | 8 | — | — | 5 | 6 |
| Spectra Light Pink Shades | seed | PM | shade | 6.5 | — | 4.0 | 13.0 | — | 7.5 | 1.9 | 6 | 4 | — | — | 5 | 6 |

Table 8 (continued). New Guinea *impatiens* cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Seed Type | Seed Source ¹ | Exposure | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | |
|-----------------------|-----------|--------------------------|----------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|------|----------|------|--------------|-----|
| | | | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | |
| | | | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 |
| Spectra Red Shades | seed | PM | shade | — | — | 5.0 | — | — | 10.0 | 2.0 | — | — | — | — | 6 | 5 |
| Spectra Rose Shades | seed | PM | shade | 6.0 | — | 5.0 | 12.0 | — | 10.0 | 2.0 | 7 | 5 | — | — | 7 | 8 |
| Spectra Salmon Shades | seed | PA,PM | shade | 7.4 | 11.3 | 7.0 | 10.8 | 10.0 | 10.0 | 2.1 | 6 | 5 | 9 | 9 | 8 | 8 |
| Spectra Salmon Shades | seed | PM | sun | — | — | 8.0 | — | — | 13.0 | 1.3 | — | — | — | — | 6 | 6 |
| Spectra White | seed | PM | shade | — | — | 3.5 | — | — | 6.0 | 2.0 | — | — | — | — | 7 | 5 |
| Tango | seed | AAS | shade | 11.0 | 25.5 | 9.0 | 10.0 | 8.0 | 12.0 | 1.8 | 7 | 6 | 10 | 10 | 9 | 7 |
| Tango | seed | AAS | sun | — | — | 9.0 | — | — | 16.0 | 2.0 | — | — | — | — | 7 | 6 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

IMPATIENS, STANDARD

Impatiens x wallerana, first found in East Africa in 1896, has gained widespread popularity as a low maintenance bedding plant that blooms profusely in shady areas throughout the summer. Different cultivars grow to heights of 8 to 14 inches. Dwarf plants that have more numerous flowers, and which do not need pinching, are growing in popularity.

Color range of *impatiens* blooms includes salmon, orange and many shades of red, pink, lilac, violet and white. Bicolors also occur.

Impatiens are easy to root from cuttings, but they are primarily grown from seed. There are about 45,000 seeds per ounce. It takes about three months for standard *impatiens* to grow from seed to good-sized flowering plants, although breeders are releasing new earlier flowering series.

Impatiens seeds need to be thinly sown into a thoroughly moist light medium, with a minimal covering of very fine vermiculite just sufficient to maintain moisture. Light must be able to reach the seed for maximum, uniform germination. Constant red light hastens germination — to between three and five days — but seeds germinate in 14 to 21 days under greenhouse conditions. Light sources need to be either removed or switched to cool white immediately after germination to avoid seedling blanching and stretching. Seedlings must be kept moist.

Seedlings 1 inch tall can be transplanted into trays, flats or small pots about a month after sowing, but damage easily and must be handled carefully. Plug production is an excellent alternative. *Impatiens* are susceptible to frost, but not sensitive to daylength.

Impatiens tolerate partial shade, and require deeply dug and improved soil. They do not compete well with tree roots. They produce bushier plants if branch tips are pinched. They also make excellent container and window box plants.

Impatiens continue to dominate as the most popular bedding plant among consumers. They accounted for about 17 percent of the total bedding plant crop in 1993. Among growers/marketers, 91 percent rated them to be excellent items. No other plant is consistently rated as well as *impatiens* by as many growers. It has been the best selling plant for more than 50 percent of growers since 1990.

'Accent Bright Eye', 'Blitz 2000 Red', and 'Impulse Bright Eye' were highly rated at the Morris and Grand Rapids sites in 1993.

Table 7. Standard *impatiens* cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | | | |
|----------------------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|------|----------|------|--------------|-----|---|---|
| | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | | |
| | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | | |
| Accent Apricot | GO | — | 15.0 | — | — | 13.0 | — | 1.8 | — | — | 5 | 4 | — | — | — | — |
| Accent Bright Eye | GO | 4.5 | — | 5.0 | 13.5 | — | 9.5 | 1.5 | 8 | 8 | — | — | 8 | 5 | — | — |
| Accent Burgundy Star | GO | 4.7 | — | 5.0 | 11.5 | — | 14.0 | 1.4 | 5 | 4 | — | — | 6 | 5 | — | — |
| Accent Coral | GO | — | 15.0 | — | — | 8.0 | — | 1.8 | — | — | 6 | 5 | — | — | — | — |
| Accent Lilac | GO | 6.0 | — | — | 12.5 | — | — | 2.2 | 7 | 8 | — | — | — | — | — | — |

Table 7 (continued). Standard impatiens cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower size (inches) ³ | Overall Quality Rating ⁴ | | | | | |
|--------------------------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|-----|----------|------|--------------|---|
| | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | |
| | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | |
| Accent Orange | GO | 6.0 | — | — | 12.5 | — | — | 2.0 | 6 | 7 | — | — | — | — |
| Accent Orange Star | GO | 7.5 | — | 4.0 | 13.5 | — | 11.0 | 1.4 | 7 | 7 | — | — | 7 | 4 |
| Accent Pink | GO | — | 12.5 | — | — | 11.0 | — | 1.5 | — | — | 10 | 3 | — | — |
| Accent Red Star | GO | 5.5 | 12.5 | 4.0 | 12.5 | 12.0 | 13.0 | 1.3 | 6 | 5 | 6 | 5 | 9 | 6 |
| Accent Rose | GO | 5.5 | — | — | 15.0 | — | — | 1.7 | 7 | 5 | — | — | — | — |
| Accent Rose Star | GO | 5.0 | — | 6.0 | 12.5 | — | 12.0 | 1.4 | 5 | 4 | — | — | 9 | 6 |
| Accent Violet Star | GO | 7.0 | 13.3 | 4.0 | 16.0 | 11.5 | 15.0 | 1.6 | 6 | 6 | 6 | 7 | 7 | 5 |
| Blitz 2000 Red | SG | 7.7 | — | 7.0 | 14.5 | — | 18.5 | 1.6 | 8 | 8 | — | — | 9 | 6 |
| Blitz 2000 Rose | SG | 5.5 | — | — | 11.5 | — | — | 1.7 | 4 | 4 | — | — | — | — |
| Blitz 2000 Rose Star | SG | — | — | 3.5 | — | — | 7.5 | 1.3 | — | — | — | — | 9 | 5 |
| Blitz 2000 Violet | GO | — | 17.0 | — | — | 10.5 | — | 1.8 | — | — | 10 | 4 | — | — |
| Dazzler Apricot | BA | 4.5 | — | 4.0 | 12.5 | — | 8.0 | 1.4 | 7 | 6 | — | — | 6 | 4 |
| Dazzler Rose Improved | BA | 4.5 | — | — | 9.0 | — | — | 1.7 | 7 | 5 | — | — | — | — |
| Dazzler Sky Blue | BA | 4.5 | — | — | 11.5 | — | — | 1.7 | 6 | 6 | — | — | — | — |
| Impulse Appleblossom | SG | — | 14.5 | — | — | 8.5 | — | 2.3 | — | — | 9 | 6 | — | — |
| Impulse Bright Eye | SG | 4.5 | — | 5.0 | 12.5 | — | 9.5 | 1.6 | 8 | 8 | — | — | 8 | 6 |
| Impulse Lilac | SG | 6.0 | — | — | 9.0 | — | — | 2.0 | 4 | 4 | — | — | — | — |
| Impulse Lilac-Blue | SG,GO | 6.0 | 14.5 | — | 15.5 | 12.0 | — | 1.6 | 7 | 7 | 9 | 3 | — | — |
| Impulse Orange Bicolor | SG | 6.0 | 7.5 | 4.0 | 12.0 | 7.0 | 11.0 | 1.4 | 6 | 7 | 7 | 2 | 7 | 3 |
| Impulse Pink | SG | 7.0 | — | — | 11.5 | — | — | 2.0 | 7 | 6 | — | — | — | — |
| Impulse Rose | SG | 7.0 | — | — | 14.0 | — | — | 1.7 | 4 | 4 | — | — | — | — |
| Impulse Salmon Orange | SG | — | — | 5.0 | — | — | 12.0 | 1.0 | — | — | — | — | 8 | 6 |
| Impulse Violet | SG | 6.0 | — | — | 13.0 | — | — | 2.0 | 7 | 6 | — | — | — | — |
| Mega Orange Star | GO | 5.0 | — | 7.0 | 12.0 | — | 14.0 | 1.9 | 4 | 5 | — | — | 8 | 4 |
| Showstopper Cherry Flair | BA | 5.0 | — | 3.0 | 12.5 | — | 11.0 | 1.5 | 5 | 5 | — | — | 7 | 6 |
| Tempo Mixed | BS | — | — | 4.0 | — | — | 8.0 | 1.3 | — | — | — | — | 8 | 5 |
| Tempo Orange | BS | 5.0 | — | — | 11.5 | — | — | 2.0 | 7 | 6 | — | — | — | — |
| Tempo Pink | BS | 7.0 | — | — | 15.0 | — | — | 2.2 | 6 | 7 | — | — | — | — |
| Tempo Rose | BS | 5.0 | — | — | 9.5 | — | — | 2.2 | 6 | 7 | — | — | — | — |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 19 scale for floral display and foliage quality.

KALE, ORNAMENTAL

Though flowering cabbages and kales (*Brassica oleracea* Acephala Group) are actually edible members of the cabbage family, many cultivars have been grown in the Orient for hundreds of years for their beautiful colored foliage.

Ornamental kale's "flower" is its central leaf cluster. The leaves of this cluster turn a

contrasting color as the days and nights become cooler in late summer and fall. Colors range from white to pink to red. Leaf shape also varies between cultivars, from the smooth, wavy, "round-leaved" plants to the frilly "fringed-leaved" to the deeply notched "feather-leaved" type.

Because ornamental kale is quite frost-

tolerant, it is growing in popularity as a bedding plant with consumers in colder regions. Its color intensifies with frost, and plants can hold a good appearance right up to the first snowfall.

Ornamental kale can be sold in spring, summer, or fall, but it takes about 11 weeks to produce a marketable transplant in a

6-inch pot. Germination occurs in ten days at 70° F and requires light. Excessive stem elongation may be a problem if plants experi-

ence high temperatures or low light. When planting out, space the transplants 18 inches apart to allow for mature spread.

Most cultivars of kale were excellent performers at Grand Rapids, but did not do as well at Morris.

Table 9. Ornamental kale cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Overall Quality Rating ³ | | | | |
|---------------------|--------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Coral Prince | feather leaf | AT | 17.0 | — | 26.0 | — | 10 | 8 | — | — | — |
| Feather, Red | feather leaf | AT | — | 26.0 | — | 25.0 | — | — | 10 | 10 | 10 |
| Feather, White | feather leaf | AT | — | 27.0 | — | 22.0 | — | — | 10 | 10 | 8 |
| Kamome Red | feather leaf | AT,JS | 11.0 | 11.5 | 20.0 | 14.2 | 6 | 6 | 9 | 8 | 10 |
| Kamome White | feather leaf | AT,JS | 12.0 | 12.8 | 22.2 | 14.5 | 6 | 5 | 10 | 10 | 10 |
| White Lady | feather leaf | AT | — | 11.0 | — | 15.0 | — | — | 10 | 8 | 8 |
| Chidori | fringed leaf | SH | — | 10.5 | — | 19.0 | — | — | 10 | 10 | 10 |
| Chidori, Red | fringed leaf | AT | — | 11.3 | — | 19.0 | — | — | 10 | 10 | 10 |
| Chidori, White | fringed leaf | AT | — | 11.0 | — | 14.0 | — | — | 8 | 10 | 10 |
| Nagoya Red Improved | fringed leaf | SK | 15.0 | 13.0 | 21.0 | 17.0 | 6 | 4 | 10 | 10 | 10 |
| Nagoya White | fringed leaf | SK | 13.0 | 11.5 | 20.0 | 17.0 | 6 | 6 | 8 | 10 | 10 |
| Sparrow, Red | fringed leaf | AT | — | 12.0 | — | 15.0 | — | — | 8 | 8 | 10 |
| Sparrow, White | fringed leaf | AT | — | 13.0 | — | 15.0 | — | — | 8 | 8 | 10 |
| Ornamental Mix | mix | NK | 17.0 | 16.0 | 21.0 | 18.0 | 6 | 6 | 8 | 8 | 8 |
| Osaka Pink | round leaf | SK | 20.0 | 17.0 | 22.5 | 17.0 | 6 | 6 | 10 | 8 | 10 |
| Osaka Red | round leaf | SK | 18.0 | 15.5 | 20.5 | 15.0 | 2 | 4 | 10 | 10 | 10 |
| Osaka White | round leaf | SK | 17.0 | 13.0 | 22.7 | 15.0 | 8 | 4 | 10 | 8 | 10 |
| Pigeon, Red | round leaf | AT | 14.0 | 15.5 | 19.0 | 16.0 | 6 | 6 | 10 | 10 | 10 |
| Pigeon, White | round leaf | AT | — | 13.0 | — | 18.0 | — | — | 10 | 8 | 10 |
| Tokyo Pink | round leaf | SK | 15.0 | 14.0 | 21.5 | 15.0 | 6 | 6 | 10 | 10 | 10 |
| Tokyo Red | round leaf | SK | 15.0 | 13.0 | 23.5 | 16.0 | 6 | 4 | 10 | 10 | 10 |
| Tokyo White | round leaf | SK | 15.0 | 14.5 | 16.5 | 14.0 | 6 | 4 | 10 | 10 | 10 |

¹ See Source List for seed source key. ² Mature height; site average. ³ Rating on 1 to 10 scale for display and foliage quality.

LISIANTHUS

Native to the Great Plains of North America, lisianthus (*Eustoma grandiflorum*) was introduced to Europe in 1835. By 1952, it was being grown in Japan, where its beauty and keeping qualities after cutting made it a highly prized flower, and the focus of intensive breeding efforts. Lisianthus are now available in many shades of white, pink, blue, and violet, plus bicolors.

Lisianthus' large, cupped flowers resemble tulips when single and roses when double. The flowers are excellent in arrangements be-

cause of their long vase life. Lisianthus can also be grown as flowering pot plants.

Propagation is by tiny seeds, which germinate easily. However, subsequent growth is slow and seedlings need cool temperatures and bright light to develop well. For blooming plants in June in Minnesota, seed should be started in January. Lisianthus are also sensitive to over-fertilizing when young. After five pairs of true leaves appear, growth is more rapid. Care must be taken to not damage the brittle root system when transplanting.

Several strains are available in different heights, including the 'Mermaid' series, an extra dwarf type that remains about 8 inches tall. Other lisianthus will grow as tall as 24 inches.

Table 10. Lisianthus cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower Width (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|--------------------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|------------------------------------|-------------------------------------|------|----------|------|--------------|-----|------|
| | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | 10/5 |
| Echo Blue | SK | 16.0 | — | 12.0 | 5.0 | — | 11.0 | 3.5 | 4 | 3 | — | — | 4 | 5 | 3 |
| Echo Blue Picotee | SK | 13.0 | — | 17.0 | 5.0 | — | 7.0 | 3.6 | 2 | 2 | — | — | 4 | 5 | 3 |
| Echo Light Blue | SK | 15.0 | 24.0 | 16.0 | 7.5 | 8.0 | 5.0 | 3.5 | 5 | 4 | 10 | 7 | 5 | 5 | 4 |
| Echo Lilac Rose | SK | 15.0 | — | 19.0 | 4.0 | — | 5.0 | 2.8 | 4 | 5 | — | — | 7 | 7 | 3 |
| Echo Misty Blue | SK | 20.0 | 23.0 | 17.0 | 6.5 | 6.0 | 6.0 | 3.3 | 4 | 4 | 10 | 7 | 4 | 7 | 4 |
| Echo Mix | SK | — | — | 13.8 | — | — | 9.0 | 3.5 | — | — | — | — | 5 | 8 | 5 |
| Echo Pink | SK | 17.0 | — | 19.0 | 6.0 | — | 9.0 | 3.3 | 5 | 4 | — | — | 5 | 5 | 3 |
| Echo Pink Picotee | SK | 18.0 | 23.5 | 14.0 | 6.7 | 8.0 | 5.0 | 3.2 | 4 | 4 | 7 | 7 | 4 | 7 | 5 |
| Echo White | SK | 16.0 | — | 18.0 | 7.5 | — | 5.0 | 3.1 | 5 | 4 | — | — | 5 | 5 | 3 |
| Heidi Blue Rim | SK | 11.0 | — | 16.5 | 4.5 | — | 6.0 | 1.9 | 2 | 2 | — | — | 4 | 5 | 5 |
| Heidi Deep Blue | SK | 14.0 | 21.5 | 13.0 | 6.0 | 6.0 | 6.0 | 3.0 | 2 | 4 | 9 | 8 | 6 | 6 | 3 |
| Heidi Lilac Rose | SK | 15.0 | 23.0 | 18.5 | 7.5 | 7.5 | 8.0 | 3.1 | 5 | 5 | 10 | 7 | 7 | 8 | 5 |
| Heidi Mix | SK | — | — | 17.0 | — | — | 3.0 | 2.0 | — | — | — | — | 6 | 5 | 3 |
| Heidi Orchid | SK | 12.0 | — | — | 6.0 | — | — | 4.0 | 2 | 2 | — | — | — | — | — |
| Heidi Pastel Blue | SK | 16.0 | — | 16.0 | 6.2 | — | 6.0 | 2.5 | 5 | 5 | — | — | 7 | 7 | 3 |
| Heidi Pink Rim | SK | 15.0 | — | 18.0 | 5.0 | — | 6.0 | 2.4 | 4 | 4 | — | — | 3 | 4 | 4 |
| Heidi Pure White | SK | 15.0 | — | 16.5 | 6.0 | — | 4.0 | 1.5 | 4 | 3 | — | — | 5 | 5 | 4 |
| Heidi Rose Pink | SK | 20.0 | 26.5 | 21.0 | 4.0 | 6.5 | 6.0 | 2.2 | 5 | 6 | 9 | 7 | 6 | 5 | 5 |
| Heidi Sky Blue | SK | 14.0 | — | 19.0 | 4.0 | — | 5.0 | 2.5 | 4 | 3 | — | — | 6 | 5 | 3 |
| Mermaid Blue | SK | 5.5 | — | 5.0 | 6.0 | — | 4.8 | 2.0 | 2 | 2 | — | — | 4 | 3 | 2 |
| Mermaid Pink | SK | 6.0 | — | 7.0 | 4.0 | — | 6.0 | 2.4 | 2 | 2 | — | — | 5 | 7 | 5 |
| Mermaid White | SK | 4.0 | — | 7.0 | 5.0 | — | 6.0 | 1.9 | 2 | 2 | — | — | 5 | 7 | 4 |
| Royal Lavender | AT | 11.0 | — | — | 5.0 | — | — | 3.2 | 3 | 3 | — | — | — | — | — |
| Royal Light Purple | AT | 18.0 | — | — | 5.0 | — | — | 2.0 | 4 | 4 | — | — | — | — | — |
| Royal Pink | AT | — | — | 21.0 | — | — | 8.0 | 2.0 | — | — | — | — | 6 | 6 | 3 |
| Royal Purple | AT | — | — | 17.0 | — | — | 7.5 | 2.5 | — | — | — | — | 7 | 6 | 3 |
| Royal Violet | AT | 18.0 | — | — | 6.0 | — | — | 1.5 | 3 | 3 | — | — | — | — | — |
| Royal White | AT | — | — | 18.0 | — | — | 7.0 | 2.0 | — | — | — | — | 5 | 7 | 3 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

MARIGOLD

The marigold (*Tagetes*) is one of the most widely grown annuals. Hundreds of cultivars are available in the trade.

The species originated in Mexico and was grown in Spain more than 400 years ago. Different types spread through France, Africa and England, and later returned to North America with "French" and "African" attached to their names to distinguish them from the European

native *Calendula* which was then called the "pot marigold."

Tagetes patula, the French marigold, is a shorter plant with small, broad-petaled flowers that are quickly produced from seed. Many flowers are crested, with the central disk higher than the surrounding petals. 'French Orange Winner' was highly rated at the Grand Rapids site.

Tagetes erecta, the African or American marigold, is much taller, approaching three feet in height, with larger flowers that tend to be produced late in summer. The 'Excel' series, however, blooms in just 10 weeks from seed. At Grand Rapids, 'Voyager Orange' received high marks in 1993.

Much breeding of these plants is done in the U.S., and many products of those efforts

have been All-America Selections. A recent development is the triploid type, is a naturally sterile hybrid (*Tagetes erecta x patula*). These triploids do not set seed, and they continue to flower heavily through the growing season.

For early flowers, seeds should be sown indoors into thoroughly moist media about six weeks ahead of outdoor planting. The seeds have a high germination rate and should be scattered thinly. Seedlings can be transplanted into a variety of soil mixes. Planted directly in

the garden, seeds should be covered thinly with moist earth. Seedlings grow rapidly in warm weather.

Marigold flower colors span the range of yellows, oranges, creams and reds, and can be found both in solid colors and in combinations. Most marigolds flower sooner under short days.

Aster leafhoppers, spider mites and aphids can all be problems for growers on seedlings

and small plants. In the garden, diseases and insects are rarely a problem for marigolds, though aster yellows can be severe in some seasons. Cool, wet weather contributed to mold problems in 1993.

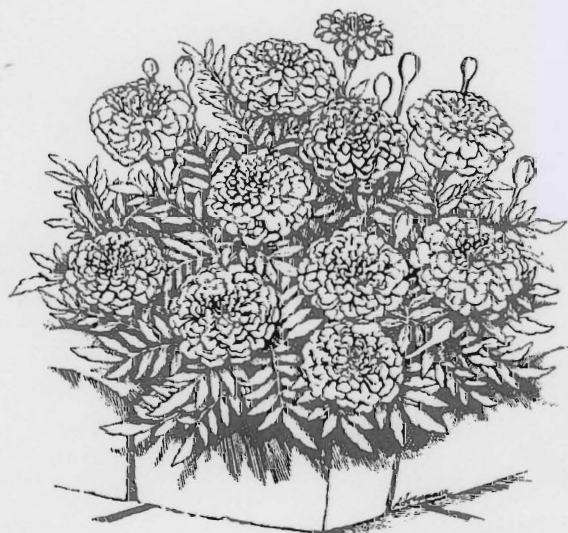
Together, the dwarf French and tall American marigold types accounted for about 7 percent of the total U.S. bedding plant crop in 1993. Among growers and marketers, 26 percent rated them to be excellent items.

Table 11. Marigold cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | Overall Quality Rating ⁴ | | | | |
|-------------------------|----------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| American Indian Gold | American | GR | 16.0 | — | 17.0 | — | 2.5 | 6 | 5 | — | — | — |
| Discovery Orange | American | BS | 10.0 | 6.0 | 15.5 | 9.0 | 3.5 | 7 | 5 | 9 | 6 | 2 |
| Discovery Yellow | American | BS | 12.0 | — | 12.0 | — | 2.7 | 6 | 6 | — | — | — |
| Excel Gold | American | GO | 19.0 | — | 18.0 | — | 3.5 | 5 | 5 | — | — | — |
| Excel Orange | American | GO | 14.0 | 15.0 | 19.2 | 18.0 | 2.4 | 5 | 6 | 7 | 7 | 2 |
| Excel Primrose | American | GO | 13.0 | — | 16.5 | — | 2.2 | 6 | 5 | — | — | — |
| Excel Yellow | American | GO | 20.0 | — | 16.0 | — | 3.5 | 5 | 4 | — | — | — |
| Inca Gold | American | GO | 22.0 | — | 23.2 | — | 4.2 | 6 | 6 | — | — | — |
| Inca Orange | American | GO | 21.0 | 16.0 | 18.5 | 16.0 | 3.8 | 6 | 5 | 8 | 8 | 2 |
| Inca Yellow | American | GO | 27.0 | — | 18.5 | — | 3.0 | 7 | 5 | — | — | — |
| Perfection Gold | American | GO | 22.0 | — | 23.5 | — | 3.2 | 7 | 6 | — | — | — |
| Perfection Orange | American | GO | 17.0 | 14.0 | 17.5 | 14.0 | 3.6 | 5 | 5 | 9 | 7 | 2 |
| Perfection Yellow | American | GO | 21.0 | — | 19.7 | — | 3.0 | 4 | 7 | — | — | — |
| Voyager Orange | American | BS | — | 9.0 | — | 12.0 | 2.0 | — | — | 10 | 6 | 2 |
| Voyager Yellow | American | BS | 17.0 | — | 14.2 | — | 3.2 | 8 | 7 | — | — | — |
| Aurora Fire | French | GO | 9.5 | — | 16.2 | — | 2.2 | 6 | 4 | — | — | — |
| Aurora Gold | French | GO | 1 | — | 14.0 | — | 2.2 | 6 | 6 | — | — | — |
| Aurora Light Yellow | French | GO | 12.0 | — | 18.5 | — | 2.0 | 8 | 5 | — | — | — |
| Aurora Yellow Fire | French | GO | 11.0 | — | 13.5 | — | 1.7 | 6 | 4 | — | — | — |
| Disco Flame | French | BS | 9.2 | — | 12.0 | — | 1.7 | 4 | 2 | — | — | — |
| Disco Marietta | French | BS | 7.0 | — | 11.0 | — | 1.7 | 6 | 4 | — | — | — |
| Disco Queen | French | BS | 7.2 | — | 12.0 | — | 1.7 | 6 | 2 | — | — | — |
| French Champion Gold | French | RS | 9.7 | — | 10.5 | — | 2.0 | 8 | 6 | — | — | — |
| French Champion Harmony | French | RS | 12.0 | 18.2 | — | — | 1.5 | 6 | 5 | — | — | — |
| French Champion Orange | French | RS | 14.0 | 12.0 | 17.5 | 13.0 | 1.5 | 6 | 6 | 8 | 8 | 2 |
| French Champion Yellow | French | RS | 13.0 | — | 13.0 | — | 1.7 | 8 | 6 | — | — | — |
| French Gold Winner | French | RS | 10.0 | — | 13.2 | — | 1.7 | 8 | 6 | — | — | — |
| French Orange Winner | French | RS | 12.0 | 12.0 | 12.7 | 11.0 | 2.0 | 6 | 6 | 9 | 9 | 2 |
| Golden Gate | French | AAS | 13.0 | 14.0 | 15.5 | 18.0 | 2.5 | 7 | 6 | 9 | 7 | 2 |
| Hero Flame | French | BS | 11.0 | — | 15.5 | — | 2.0 | 6 | 4 | — | — | — |
| Hero Gold Improved | French | BS | 8.0 | — | 11.0 | — | 2.0 | 6 | 4 | — | — | — |
| Hero Orange | French | BS | 9.7 | 9.0 | 17.0 | 10.0 | 2.3 | 7 | 6 | 8 | 7 | 2 |
| Hero Red | French | BS | 11.0 | — | 14.2 | — | 1.7 | 5 | 4 | — | — | — |
| Janie Deep Orange | French | GO | 8.5 | 8.0 | 13.5 | 9.0 | 1.5 | 5 | 4 | 8 | 4 | 2 |
| Janie Flame | French | GO | 9.0 | — | 12.0 | — | 2.0 | 6 | 4 | — | — | — |

Table 11 (continued). Marigold cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | Overall Quality Rating ⁴ | | | | |
|--------------------|--------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Janie Harmony | French | LB | 9.7 | — | 11.7 | — | 2.0 | 8 | 6 | — | — | — |
| Janie Primrose | French | GO | 6.7 | — | 11.0 | — | 1.5 | 6 | 5 | — | — | — |
| Little Hero Flame | French | BS | — | 7.0 | — | 5.0 | 1.3 | — | — | 6 | 4 | 2 |
| Little Hero Orange | French | BS | 5.7 | 6.0 | 11.5 | 7.0 | 1.8 | 6 | 4 | 6 | 6 | 2 |
| Little Hero Spry | French | BS | 8.0 | 6.5 | 13.0 | 6.0 | 1.4 | 6 | 4 | 7 | 6 | 2 |
| Little Hero Yellow | French | BS | 11.0 | 9.0 | 15.0 | 9.0 | 2.0 | 7 | 6 | 7 | 7 | 2 |
| Safari Bolero | French | GO | 9.2 | — | 13.7 | — | 2.0 | 4 | 4 | — | — | — |
| Safari Queen | French | BS | 8.5 | — | 14.0 | — | 2.0 | 6 | 4 | — | — | — |
| Safari Scarlet | French | BS | 13.0 | — | 13.0 | — | 2.7 | 7 | 5 | — | — | — |
| Safari Tangerine | French | BS | 12.0 | 10.5 | 19.2 | 10.0 | 1.9 | 6 | 5 | 8 | 7 | 2 |
| Safari Yellow | French | BS | 12.0 | — | 15.0 | — | 2.2 | 8 | 6 | — | — | — |
| Try-em Girl Yellow | French | GR | 7.0 | — | 10.2 | — | 1.7 | 3 | 3 | — | — | — |

**Marigold 'Golden Gate'**

A very different flower distinguishes 'Golden Gate' from traditional French marigolds. Flowers are large, very double and not crested. Expect to see these golden mahogany blooms about 65 days after sowing. This was a 1989 All-America Selection.

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of flower head; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

NICOTIANA

A lavishly free-blooming plant, *Nicotiana alata*, also known as flowering tobacco, is closely related to the petunia. It shares the petunia's tolerance for many different site conditions. *Nicotiana* does well in full sun and part shade, and seems to handle severe weather without damage.

For best germination, start the tiny seeds at 70° F and don't cover. Light will encourage

germination in about 12 days. Plan on six to eight weeks from seed to flower. *Nicotiana* requires long days to produce flower buds, so don't sow seeds before March 1.

This South American native has received a good deal of attention from plant breeders in recent years. Their efforts have been rewarded, with the tall, fragrant pastel-flowered forms natural to this plant being replaced by

several series of stocky, vivid plants. Flower colors include white, pink, red, rose, green, and yellow. The newer series tend to be less fragrant, however.

Nicotiana was a high performer at Grand Rapids in 1993, with six cultivars receiving a rating of "10" at that location.

Table 12. *Nicotiana* cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | Overall Quality Rating ⁴ | | | | |
|-----------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Metro Lilac | PM | 16.0 | 19.0 | 13.5 | 18.5 | 1.8 | 4 | 3 | 9 | 8 | 6 |
| Metro Lime | PM | — | 19.0 | — | 19.0 | 2.0 | — | — | 9 | 7 | 5 |
| Metro Mixture | PM | — | 15.5 | — | 19.0 | 2.0 | — | — | 10 | 9 | 5 |
| Metro Red | PM | 14.0 | 17.0 | 17.5 | 18.0 | 1.9 | 4 | 5 | 10 | 10 | 6 |
| Metro Rose | PM | 13.0 | 20.0 | 17.5 | 26.0 | 2.0 | 6 | 5 | 10 | 9 | 6 |
| Metro White | PM | 15.0 | 15.0 | 19.0 | 17.0 | 1.6 | 6 | 4 | 10 | 7 | 5 |
| Nicki Lime | PM | 25.0 | — | 19.0 | — | 1.7 | 8 | 5 | — | — | — |
| Nicki Pink | PM | 25.0 | — | 22.0 | — | 1.5 | 8 | 7 | — | — | — |
| Nicki Red | PM | 21.0 | — | 19.0 | — | 2.2 | 8 | 7 | — | — | — |
| Nicki Rose | PM | 25.0 | — | 18.0 | — | 2.0 | 7 | 7 | — | — | — |
| Nicki Series Mix | JS,PM | 22.0 | 24.0 | 25.0 | 32.0 | 2.3 | 8 | 6 | 9 | 10 | 6 |
| Sensation Mixed | TM | — | 37.5 | — | 36.0 | 3.0 | — | — | 6 | 9 | 4 |
| Starship Lemon | BA | 18.0 | — | 18.0 | — | 1.5 | 7 | 5 | — | — | — |
| Starship Pink | BA | 16.0 | 14.0 | 16.5 | 14.0 | 1.8 | 6 | 4 | 9 | 8 | 6 |
| Starship Red Improved | BA | — | 18.0 | — | 22.0 | 3.0 | — | — | 8 | 10 | 5 |
| Starship Rose Pink | BA | 13.0 | — | 19.0 | — | 1.2 | 6 | 4 | — | — | — |
| White Perfume | SH | 46.0 | 37.0 | 36.0 | 24.0 | 3.0 | 6 | 5 | 8 | 8 | 4 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

PANSY

Pansies (*Viola x wittrockiana*) are botanically considered biennials or perennials, but are thought of as annuals because in most places their flowering lives last only one gardening year. Occasionally they will survive a Minnesota winter to bloom again. Fall planting cultivars is the newest trend. Minnesota's 1993 trials examined seven cultivars in a replicated planting begun the previous fall. All

grew and flowered well in the 1993 summer.

Top 1993 performers overall in Grand Rapids were 'Fama Silver Blue,' 'Maxim Marina,' 'Maxim Red & Yellow' and 'Ultima Pink Shades.'

Pansies can be found with flowers in nearly every color imaginable, as single colors,

mixes and blends, and with smooth flowers or ruffles. Larger flowers, more vigorous plants and the increased ability to bloom in hot weather are characteristic of modern cultivars. They do, however, prefer cooler temperatures, and tolerate partial shade.

Pansy 'Jolly Joker'

This unique orange/purple bicolor is an attention getter. It has above average heat and weather tolerance, dwarf habit and large flowers. Normal pansy culture produces a flowering peak in about four months. This was a 1990 All-America Selection.



Seeds are sown in mid-January to flower between May and June. They need good, well drained soil and cooler temperatures to germinate, and cool 50° F temperatures for growing.

They should be set out in the garden as soon as possible in the spring.

Pansies are considered to be a medium maintenance plant that flowers best when old blossoms are picked off before going to seed. Sprawling branches can be cut back close to

the base to allow for new growth and blooms.

The pansy market has recently expanded. In 1993 pansies accounted for almost 7 percent of the total U.S. bedding plant crop. Bedding plant growers/marketers rate them as one of the top five crops in "excellent sales" trends.



Pansy 'Padparadja'

This deep, pure orange colored pansy is a floral gem. A small 6-inch plant, it retains its rich color even in hot summer weather. It performs well in sun or semishade and is easily grown from seed. This was a 1991 All-America Selection.

Table 13. Pansy cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Time of Planting | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | 1993 Overall Quality Rating ⁴ | | | | |
|-------------------------------|------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|--|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Crown Mixed | fall 1992 | SK | — | 7.5 | — | 13.3 | 1.8 | — | — | 7 | 7 | 7 |
| Crown Yellow Lip | fall 1992 | VS | — | 8.7 | — | 20.7 | 2.0 | — | — | 9 | 8 | 8 |
| Crystal Bowl Mixed | fall 1992 | SK | — | 10.5 | — | 18.3 | 1.9 | — | — | 8 | 7 | 8 |
| Maxim Mixed | fall 1992 | SK | — | 9.2 | — | 22.0 | 1.9 | — | — | 8 | 8 | 8 |
| Royal Mixed | fall 1992 | SK | — | 8.5 | — | 15.0 | 2.0 | — | — | 8 | 7 | 8 |
| Silver Wings | fall 1992 | EB | — | 8.7 | — | 17.7 | 1.6 | — | — | 8 | 7 | 7 |
| Springtime Mixed | fall 1992 | CL | — | 9.7 | — | 17.3 | 1.8 | — | — | 9 | 7 | 8 |
| Accord Blue Blotch | spring 1993 | GO | 8.7 | — | 7.0 | — | 2.0 | 5 | 5 | — | — | — |
| Accord Rose Blotch | spring 1993 | GO | 8.0 | 9.5 | 14.0 | 10.3 | 2.4 | 5 | 4 | 7 | 8 | 8 |
| Bingo Red & Yellow | spring 1993 | PA | — | 9.0 | — | 8.0 | 2.3 | — | — | 9 | 8 | 8 |
| Brightlight Clear Yellow | spring 1993 | GR | 5.0 | — | 9.0 | — | 1.5 | 4 | 4 | — | — | — |
| Clear Sky Purple | spring 1993 | SG | 9.0 | — | 11.7 | — | 1.7 | 7 | 6 | — | — | — |
| Clear Sky True Blue | spring 1993 | SG | 6.0 | — | 9.0 | — | 2.0 | 6 | 6 | — | — | — |
| Clear Sky White | spring 1993 | SG | 7.0 | — | 10.5 | — | 2.0 | 5 | 4 | — | — | — |
| Clear Sky Yellow | spring 1993 | SG | 5.0 | — | 8.0 | — | 2.0 | 5 | 4 | — | — | — |
| Crown Rose | spring 1993 | SK | — | 9.0 | — | 12.0 | 2.3 | — | — | 7 | 6 | 8 |
| Crown Scarlet | spring 1993 | SK | — | 6.5 | — | 9.0 | 2.5 | — | — | 6 | 6 | 6 |
| Crystal Bowl Rose | spring 1993 | SK | — | 10.0 | — | 12.5 | 2.3 | — | — | 7 | 7 | 8 |
| Crystal Bowl Scarlet | spring 1993 | SK | — | 7.5 | — | 10.0 | 1.8 | — | — | 6 | 7 | 7 |
| Fama Red | spring 1993 | EB | 8.0 | 9.5 | 8.0 | 9.5 | 1.7 | 3 | 3 | 7 | 9 | 10 |
| Fama Silver Blue | spring 1993 | EB | — | 9.0 | — | 12.5 | 2.0 | — | — | 10 | 10 | 9 |
| Giant Forerunner Illumination | spring 1993 | EB | — | 8.5 | — | 10.5 | 2.0 | — | — | 7 | 8 | 7 |
| Giant Forerunner Ruby | spring 1993 | EB | 8.0 | 8.0 | 13.0 | 11.0 | 1.8 | 4 | 4 | 7 | 8 | 9 |
| Imperial Frosty Rose | spring 1993 | AT | — | 7.0 | — | 11.0 | 2.8 | — | — | 8 | 8 | 8 |
| Imperial Pink Shades | spring 1993 | AT | — | 9.0 | — | 10.0 | 2.3 | — | — | 8 | 9 | 9 |

Table 13. Pansy cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Time of Planting | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size ³ (inches) | 1993 Overall Quality Rating ⁴ | | | | |
|-----------------------------|------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|--------------------------------------|--|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Joker Mahogany-Gold | spring 1993 | EB | — | 10.0 | — | 13.0 | 2.0 | — | — | 8 | 9 | 9 |
| Jolly Joker | spring 1993 | AAS | 8.0 | 7.0 | 13.5 | 10.5 | 2.0 | 3 | 5 | 6 | 6 | 7 |
| Maxim Marina | spring 1993 | AAS,SK | 8.5 | 10.0 | 9.0 | 16.0 | 1.9 | 8 | 6 | 10 | 10 | 9 |
| Maxim Red | spring 1993 | SK | — | 8.0 | — | 9.0 | 1.8 | — | — | 6 | 8 | 8 |
| Maxim Red & Yellow | spring 1993 | SK | — | 9.5 | — | 13.0 | 2.0 | — | — | 9 | 10 | 10 |
| Maxim Rose | spring 1993 | SK | — | 6.5 | — | 9.5 | 2.3 | — | — | 7 | 7 | 9 |
| Maxim Sunset | spring 1993 | SK | — | 8.0 | — | 9.5 | 2.0 | — | — | 8 | 9 | 8 |
| Miniature Blue | spring 1993 | GR | 4.5 | — | 7.5 | — | 1.2 | 4 | 2 | — | — | — |
| Padparadja | spring 1993 | AAS,EB | 6.0 | 9.5 | 8.5 | 10.5 | 1.7 | 5 | 4 | 9 | 8 | 9 |
| Presto | spring 1993 | SH | — | 9.0 | — | 12.0 | 2.3 | — | — | 8 | 9 | 9 |
| Raspberry Rose | spring 1993 | TM | — | 9.0 | — | 8.0 | 2.0 | — | — | 7 | 8 | 7 |
| Regal Red & Yellow w/Blotch | spring 1993 | SK | — | 8.5 | — | 11.5 | 2.5 | — | — | 7 | 7 | 7 |
| Regal Rose w/Blotch | spring 1993 | SK | — | 10.5 | — | 12.5 | 2.3 | — | — | 8 | 8 | 9 |
| Regal Scarlet w/Blotch | spring 1993 | SK | — | 7.5 | — | 10.0 | 2.0 | — | — | 7 | 7 | 8 |
| Regal White w/Rose Blotch | spring 1993 | SK | — | 6.0 | — | 11.5 | 2.0 | — | — | 8 | 7 | 9 |
| Regal Yellow w/Red Blotch | spring 1993 | SK | — | 6.5 | — | 11.5 | 2.0 | — | — | 7 | 10 | 9 |
| Skyline Red | spring 1993 | SG | — | 8.5 | — | 11.0 | 2.0 | — | — | 7 | 8 | 9 |
| Skyline Red Wing | spring 1993 | SG | 7.0 | 9.0 | 9.5 | 12.0 | 2.1 | 5 | 5 | 8 | 9 | 10 |
| Springtime Violet | spring 1993 | CL | 8.0 | — | 10.5 | — | 2.0 | 6 | 6 | — | — | — |
| Ultima Pink Shades | spring 1993 | SK | — | 10.5 | — | 10.0 | 2.3 | — | — | 9 | 10 | 10 |
| Universal Blue Blotch | spring 1993 | GO | 8.0 | — | 14.5 | — | 2.0 | 5 | 5 | — | — | — |
| Universal Deep Yellow | spring 1993 | GO | 6.0 | — | 10.0 | — | 1.5 | 4 | 4 | — | — | — |
| Universal Mixture | spring 1993 | GO | — | 7.0 | — | 13.0 | 2.3 | — | — | 7 | 8 | 7 |
| Universal Red | spring 1993 | GO | 9.0 | 8.8 | 12.0 | 9.5 | 1.8 | 5 | 4 | 8 | 10 | 10 |
| Universal Red Bicolor | spring 1993 | GO | — | 11.5 | — | 11.5 | 2.3 | — | — | 6 | 9 | 10 |
| Universal True Blue | spring 1993 | GO | 7.0 | — | 12.0 | — | 2.0 | 6 | 7 | — | — | — |
| Universal White | spring 1993 | GO | 8.0 | — | 8.5 | — | 1.7 | 6 | 5 | — | — | — |
| Universal White Blotch | spring 1993 | GO | 8.0 | — | 8.7 | — | 2.0 | 6 | 5 | — | — | — |
| Universal Yellow Blotch | spring 1993 | GO | 6.0 | — | 9.0 | — | 1.7 | 5 | 4 | — | — | — |
| Victorian | spring 1993 | GR | 7.5 | — | 9.7 | — | 2.0 | 4 | 3 | — | — | — |
| Watercolor | spring 1993 | SH | — | 8.5 | — | 10.0 | 2.0 | — | — | 7 | 9 | 8 |

Pansy 'Maxim Marina'

A tough and enduring pansy with delicate blue and white flowers. With enough moisture, even sun, heat and drought will not stop its flowering. It grows easily in beds and containers. This was a 1991 All-America Selection.



¹ See *Source List* for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

PETUNIA

Ancestors of the modern *Petunia* probably originated in South America. Breeding among open pollinated cultivars was pioneered by a French botanist in the 1800s. Modern hybrids were introduced in the 1950s and now essentially form the entire market. There are hundreds of named varieties, categorized according to flower size and growth habit as multifloras or grandifloras, single or double types, or as the new floribundas.

Large flowered grandifloras have been the most popular type, although they have fewer flowers than the smaller free flowering multifloras. Recently, however, floribunda petunias that combine many of the best qualities of both have been gaining in popularity. All cultivars bloom throughout the summer. Flow-

ers can be found in almost every color: white, pink, red, blue, lavender, purple, yellow and combinations. Many petunias have been designated All-America Selections over the years.

Petunia seeds are very small (there are about 200,000 per ounce) and must be sown carefully on the surface of a moist, light soil mix. They require light and uniform moisture. Germination takes about one week.

To keep petunias in bloom in the garden, faded flowers should be removed, along with the portion of the plant immediately below the flower, where the seeds form. Petunias require full sun and a warm soil. Plant heights range between 10 and 15 inches.

Insects are not usually a problem in production, but diseases can be, specifically damping-off caused by *Rhizoctonia*, *Pythium* or *Phytophthora*. The multiflora and floribunda types generally provide more colorful displays and hold up better under wet weather than do grandifloras.

Petunias are the third most popular annuals, substantially trailing impatiens but almost matching geraniums. Petunias accounted for about 10 percent of the 1993 U.S. market for bedding plants. Many bedding plant growers/marketers (39 percent) strongly rated them as excellent items.

Table 14. Petunia cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|---------------------------|-------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Celebrity White | floribunda | BS | 12.0 | — | 12.5 | — | 2.5 | 5 | 4 | — | — | — |
| Celebrity Blue | floribunda | BS | 16.0 | — | 17.0 | — | 2.0 | 6 | 5 | — | — | — |
| Celebrity Hot Pink | floribunda | BS | 19.0 | — | 20.5 | — | 2.7 | 5 | 5 | — | — | — |
| Celebrity Lilac | floribunda | BS | 18.0 | — | 18.5 | — | 2.5 | 6 | 5 | — | — | — |
| Celebrity Orchid Ice | floribunda | BS | 15.0 | 11.5 | 16.0 | 44.0 | 1.4 | 4 | 3 | 7 | 9 | 5 |
| Celebrity Pink Morn | floribunda | BS | 19.0 | 14.0 | 16.0 | 43.5 | 1.4 | 5 | 5 | 8 | 8 | 6 |
| Celebrity Raspberry Ice | floribunda | BS | 10.0 | 11.0 | 12.0 | 33.0 | 1.3 | 4 | 3 | 6 | 7 | 4 |
| Celebrity Red | floribunda | BS | 11.0 | 13.0 | 15.0 | 26.0 | 1.1 | 4 | 4 | 6 | 7 | 4 |
| Celebrity Red Morn | floribunda | BS | 15.0 | 14.5 | 16.0 | 52.0 | 1.4 | 5 | 4 | 9 | 7 | 6 |
| Celebrity Summer Ice | floribunda | BS | — | 13.5 | — | 40.0 | — | — | — | 7 | 9 | 4 |
| Double Madness Rose/White | floribunda | BA | — | 18.5 | — | 44.0 | — | — | — | 8 | 7 | 6 |
| Double Madness Sheer | floribunda | BA | — | 14.0 | — | 31.5 | — | — | — | 7 | 9 | 4 |
| Double Madness Silver | floribunda | BA | — | 18.0 | — | 37.0 | — | — | — | 8 | 9 | 5 |
| Madness Burgundy Star | floribunda | BA | — | 15.0 | — | 28.0 | — | — | — | 7 | 9 | 4 |
| Madness Plum Crazy | floribunda | BA | — | 10.0 | — | 38.5 | — | — | — | 8 | 9 | 6 |
| Madness Rose Star | floribunda | BA | 13.0 | 10.5 | 11.0 | 37.0 | 1.0 | 4 | 5 | 9 | 8 | 5 |
| Cherry Frost | grandiflora | GO | 11.0 | — | 12.5 | — | 2.5 | 4 | 2 | — | — | — |
| Daddy, Orchid | grandiflora | AAS | 9.0 | 12.0 | 16.0 | 30.0 | 1.6 | 4 | 2 | 8 | 9 | 4 |
| Dreams Red | grandiflora | PM | 9.0 | 11.5 | 11.0 | 32.0 | 1.0 | 4 | 2 | 6 | 8 | 5 |
| Falcon Pink Veined | grandiflora | SK | 9.0 | 12.5 | 12.0 | 35.5 | 1.6 | 4 | 2 | 6 | 7 | 5 |
| Falcon Plum Veined | grandiflora | SK | 9.0 | 12.5 | 6.5 | 22.0 | 1.9 | 4 | 2 | 6 | 8 | 4 |
| Falcon Red | grandiflora | SK | 11.0 | 14.0 | 16.0 | 39.0 | 1.3 | 4 | 2 | 6 | 8 | 5 |
| Falcon Red Morn | grandiflora | SK | — | 13.0 | — | 38.0 | — | — | — | 7 | 7 | 6 |
| Falcon Red Veined | grandiflora | SK | 10.0 | 10.0 | 14.5 | 35.5 | 1.3 | 4 | 3 | 6 | 7 | 6 |
| Flash Blue | grandiflora | SG | 17.0 | — | 21.0 | — | 2.2 | 6 | 5 | — | — | — |

Table 14 (continued). *Petunia* cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|-------------------|-------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Flash Pink | grandiflora | SG | 24.0 | — | 17.0 | — | 2.2 | 5 | 5 | — | — | — |
| Flash Pink Center | grandiflora | SG | 18.0 | 8.5 | 18.0 | 38.0 | 1.4 | 5 | 5 | 8 | 8 | 6 |
| Flash Red | grandiflora | SG | 8.0 | 11.5 | 11.0 | 39.0 | 1.3 | 3 | 2 | 6 | 8 | 6 |
| Flash Rose | grandiflora | SG | 21.0 | — | 12.0 | — | 2.0 | 5 | 5 | — | — | — |
| Flash Velvet | grandiflora | SG | 18.0 | — | 16.0 | — | 2.5 | 3 | 5 | — | — | — |
| Highlight Carmine | grandiflora | SK | — | 10.5 | — | 36.0 | — | — | — | 6 | 8 | 5 |
| Highlight Scarlet | grandiflora | SK | 10.0 | 12.0 | 14.7 | 37.0 | 1.3 | 4 | 3 | 6 | 7 | 5 |
| Hula Hoop Red | grandiflora | SK | — | 12.5 | — | 32.0 | — | — | — | 7 | 7 | 5 |
| Picotee Red | grandiflora | SK | — | 10.5 | — | 38.0 | — | — | — | 7 | 7 | 5 |
| Prism Coral Halo | grandiflora | CL | — | 13.0 | — | 34.0 | — | — | — | 6 | 7 | 5 |

Petunia 'Polo Burgundy Star'

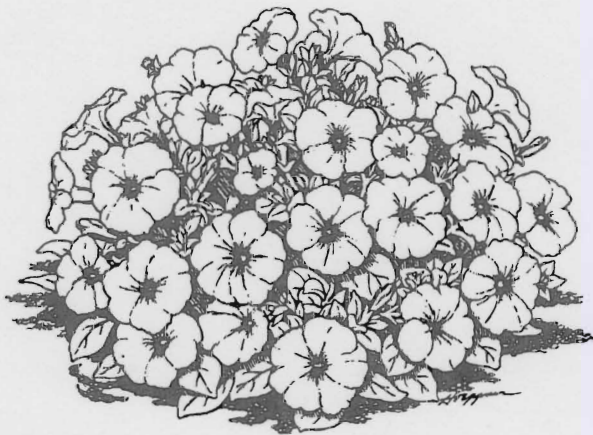
This improved single multiflora petunia shows a vivid white star pattern. Its compact spreading habit encourages exceptionally free bloom without shearing or deadheading. Two-inch flowers are produced about ten weeks after greenhouse sowing. This was a 1990 All-America Selection.



| | | | | | | | | | | | | |
|--------------------|-------------|----|------|------|------|------|-----|---|---|---|---|---|
| Prism Rose Halo | grandiflora | CL | — | 12.0 | — | 27.5 | — | — | — | 7 | 6 | 6 |
| Saturn | grandiflora | GO | 10.0 | 11.0 | 15.5 | 45.0 | 1.1 | 4 | 4 | 7 | 7 | 6 |
| Ultra Blue | grandiflora | GO | 18.0 | 13.5 | 20.5 | 34.0 | 1.5 | 6 | 6 | 7 | 8 | 6 |
| Ultra Blue Star | grandiflora | GO | 27.0 | 17.5 | 16.0 | 43.0 | 1.3 | 5 | 5 | 6 | 8 | 5 |
| Ultra Crimson Star | grandiflora | GO | — | 12.5 | — | 36.5 | — | — | — | 6 | 8 | 6 |
| Ultra Pink | grandiflora | GO | 15.0 | — | 16.7 | — | 3.0 | 6 | 5 | — | — | — |
| Ultra Plum | grandiflora | GO | — | 13.0 | — | 37.0 | — | — | — | 7 | 7 | 6 |
| Ultra Red | grandiflora | GO | 10.0 | 12.0 | 10.5 | 43.0 | 1.0 | 4 | 2 | 7 | 8 | 6 |
| Ultra Red Star | grandiflora | GO | 17.0 | 11.5 | 12.0 | 45.0 | 1.3 | 6 | 4 | 7 | 7 | 6 |
| Ultra Rose Star | grandiflora | GO | 10.0 | 14.0 | 12.5 | 49.0 | 1.3 | 4 | 5 | 8 | 8 | 6 |
| Ultra White | grandiflora | GO | 8.7 | 13.0 | 13.0 | 32.0 | 1.9 | 6 | 4 | 6 | 7 | 4 |
| Carpet Blue Lace | multiflora | PM | 23.0 | 16.0 | 26.0 | 38.0 | 1.3 | 5 | 5 | 9 | 9 | 8 |
| Carpet Flame | multiflora | TM | 12.0 | — | 14.0 | — | 2.2 | 3 | 3 | — | — | — |
| Horizon Coral Halo | multiflora | CL | — | 9.5 | — | 41.0 | — | — | — | 7 | 7 | 6 |
| Horizon Halo Rose | multiflora | CL | — | 11.0 | — | 28.0 | — | — | — | 7 | 7 | 6 |
| Horizon Ruby | multiflora | CL | 16.0 | — | 12.5 | — | 2.7 | 7 | 5 | — | — | — |
| Joy Blue | multiflora | GO | 20.0 | — | 17.0 | — | 2.0 | 6 | 5 | — | — | — |
| Joy Pink | multiflora | GO | 17.0 | — | 17.5 | — | 2.0 | 5 | 5 | — | — | — |
| Joy Red | multiflora | GO | 17.5 | 13.0 | 21.1 | 33.0 | 1.5 | 6 | 4 | 8 | 7 | 6 |
| Joy Rose | multiflora | GO | 16.0 | — | 14.2 | — | 2.2 | 8 | 5 | — | — | — |
| Joy Sky | multiflora | GO | 10.0 | — | 16.2 | — | 2.2 | 6 | 4 | — | — | — |
| Joy Star | multiflora | GO | 16.0 | 13.5 | 15.0 | 50.0 | 1.0 | 7 | 5 | 7 | 5 | 6 |

Table 14 (continued). Petunia cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|--------------------|------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Joy Starlight | multiflora | GO | 10.0 | — | 11.7 | — | 2.0 | 3 | 4 | — | — | — |
| Joy White | multiflora | GO | 14.0 | — | 18.0 | — | 2.0 | 6 | 4 | — | — | — |
| Landscaper Red | multiflora | GR | — | 12.5 | — | 39.0 | — | — | — | 9 | 8 | 6 |
| Merlin Pink Morn | multiflora | SK | — | 13.0 | — | 41.0 | — | — | — | 7 | 6 | 5 |
| Merlin Pink Veined | multiflora | SK | 8.0 | 13.5 | 7 | 35.0 | 2.7 | 4 | 2 | 8 | 9 | 5 |
| Merlin Red | multiflora | SK | 8.0 | 14.0 | 14.0 | 25.0 | 1.0 | 4 | 3 | 7 | 9 | 5 |
| Polo Blue | multiflora | SG | 16.0 | — | 12.0 | — | 2.2 | 6 | 5 | — | — | — |
| Polo Blue Star | multiflora | SG | 19.0 | 14.0 | 19.0 | 29.0 | 1.0 | 4 | 5 | 6 | 9 | 4 |
| Polo Burgundy Star | multiflora | AAS,SG | 9.0 | 12.0 | 9.0 | 35.0 | 1.0 | 4 | 2 | 8 | 9 | 5 |
| Polo Orchid Veined | multiflora | SG | 10.0 | 11.0 | 13.5 | 22.5 | 1.4 | 6 | 4 | 7 | 9 | 4 |
| Polo Pink | multiflora | SG | 18.0 | — | 24.0 | — | 2.0 | 8 | 5 | — | — | — |
| Polo Pink Veined | multiflora | SG | 17.0 | 15.0 | 18.2 | 48.0 | 1.0 | 4 | 5 | 7 | 7 | 6 |
| Polo Red | multiflora | SG | 14.0 | 12.0 | 12.5 | 40.5 | 1.1 | 4 | 2 | 8 | 7 | 6 |
| Polo Red Target | multiflora | SG | — | 16.0 | — | 35.5 | — | — | — | 8 | 9 | 6 |
| Polo Rose | multiflora | SG | 19.0 | — | 21.0 | — | 2.2 | 5 | 5 | — | — | — |
| Polo Rose Flare | multiflora | SG | 22.0 | — | 20.0 | — | 2.2 | 7 | 6 | — | — | — |
| Polo Salmon | multiflora | AAS,SG | 16.0 | 12.0 | 19.0 | 38.0 | 1.3 | 5 | 4 | 8 | 8 | 6 |
| Polo Salmon Veined | multiflora | SG | 11.0 | 14.0 | 11.0 | 32.0 | 1.0 | 4 | 4 | 6 | 7 | 6 |
| Polo Velvet | multiflora | SG | 18.0 | — | 13.0 | — | 2.2 | 5 | 5 | — | — | — |
| Primetime Blue | multiflora | GO | 16.0 | — | 19.0 | — | 2.0 | 8 | 6 | — | — | — |

*Petunia 'Polo Salmon'*

This improved multiflora flowers earlier and covers itself with a flat canopy of blooms. It shows heat, drought and weather tolerance. A bedding plant crop can be produced in about 11 weeks. This was a 1990 All-America Selection.

| | | | | | | | | | | | | |
|-----------------------------|------------|----|------|------|------|------|-----|---|---|----|---|---|
| Primetime Light Blue | multiflora | GO | 19.0 | — | 18.2 | — | 2.2 | 7 | 5 | — | — | — |
| Primetime Light Pink Veined | multiflora | GO | 19.0 | 14.0 | 19.0 | 32.0 | 1.1 | 6 | 5 | 9 | 7 | 6 |
| Primetime Pink | multiflora | GO | 19.0 | — | 18.0 | — | 2.2 | 8 | 5 | — | — | — |
| Primetime Pink Veined | multiflora | GO | 15.0 | 12.0 | 14.7 | 44.0 | 1.3 | 5 | 5 | 7 | 7 | 6 |
| Primetime Red | multiflora | GO | 12.0 | 12.5 | 12.2 | 37.0 | 1.5 | 4 | 2 | 7 | 6 | 6 |
| Primetime Red Frost | multiflora | GO | — | 13.5 | — | 30.0 | — | — | — | 5 | 7 | 5 |
| Primetime Red Veined | multiflora | GO | 14.0 | 14.5 | 15.0 | 39.0 | 1.0 | 4 | 3 | 7 | 7 | 6 |
| Primetime Rose | multiflora | GO | 9.0 | — | 11.5 | — | 2.2 | 6 | 4 | — | — | — |
| Primetime Rose Frost | multiflora | GO | 9.0 | — | 12.0 | — | 2.5 | 2 | 4 | — | — | — |
| Primetime Rose Star | multiflora | GO | 14.0 | 10.5 | 17.0 | 46.0 | 1.1 | 6 | 3 | 10 | 7 | 6 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom; value given is average across sites. ⁴ Rating on 1 to 10 scale for flower display and foliage quality.

PORTULACA

Portulaca is a small, trailing plant with vivid flowers that will normally grow in the poorest of soils, provided it has excellent drainage and full sun. Its double flowered cultivars, looking like miniature roses, give rise to its common name "moss rose."

Portulaca flowers are phototropic in that they orient their openings toward the sun. They generally also open fully only in bright sunlight, and then close at night. However, a

few new cultivars (such as the 'Sundial' series) both flower two weeks earlier and open fully under much lower light levels. Portulaca flowers can be pink, red, yellow, cream, white or orange.

The 'Sundial Fuschia' cultivar was a good performer at Morris in 1992.

Portulaca seed is very fine and will not germinate in cool temperatures.

Portulaca held slightly more than 1 percent of the 1991 U.S. market for bedding plants. Most bedding plant growers and marketers (72 percent) considered it to be an excellent or good item in that year. Four percent of commercial growers planned to increase their production of portulaca for 1994.

Table 15. Portulaca cultivars evaluated in the 1993 bedding plant trials at Morris.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | Plant Spread (inches) | Flower Width (inches) ³ | Overall Quality Rating ⁴ | |
|------------------------------|--------------------------|------------------------------------|-----------------------|------------------------------------|-------------------------------------|------|
| | | | | | 8/11 | 9/14 |
| Sundial Fuschia | BS | 6.5 | 19.0 | 1.5 | 8 | 5 |
| Sundial Pink | BS | 7.0 | 17.7 | 1.7 | 6 | 4 |
| Sundial Scarlet Rainbow Coat | RS | 7.0 | 19.5 | 1.7 | 8 | 5 |
| Sundial White | BS | 5.7 | 16.7 | 1.2 | 6 | 4 |
| Sundial Yellow | BS | 6.0 | 13.0 | -- | 5 | 4 |
| Sunnyside Cherry Red | CL | 7.0 | 19.5 | 0.7 | 7 | 5 |
| Sunnyside Clear Yellow | CL | 5.2 | 14.0 | -- | 5 | 4 |
| Sunnyside Coral | CL | 7.0 | 18.5 | 0.7 | 4 | 4 |

¹ See Source List for seed source key. ² Mature height including flowers. ³ Width of single blossom. ⁴ Rating on 1 to 10 scale for floral and foliage quality.

SALVIA

The two major types of annual salvia are *splendens*, which is actually a compact Brazilian shrub that is not winter hardy, and *farinacea*. The *farinacea* type has narrow leaves and clusters of small flowers arrayed along slender, upright stems.

Most *splendens* flowers are red, although there are newer cultivars that offer white, pink and purple shades.

The *farinacea* type typically has white, blue or purple flowers. Its flowers are borne on showy terminal clusters, and the flower stalks produce new buds continuously at their tips as they grow taller.

An entirely new and different type of salvia (*coccinea*) was introduced in 1992 as

'Lady in Red.' It was one of that year's All-America Selections.

Salvia is a low maintenance plant which flowers continuously from the opening of its first buds around July, until the frost comes in late September. Cultivars of salvia can vary in height from 10 to 30 inches.

All three salvia types need full sun for optimal growth, and bring with that need some tolerance for heat and drought. Their seeds, in fact, need considerable heat to germinate. Seed trays need to be kept at 70° F until germination, and at a minimum of 60° F thereafter. Plants should not be set into the garden until the weather is reliably warm.

While the cool weather experienced in

1993 resulted in poor growth for most *splendens* type salvias, *farinacea* and *coccinea* types did fairly well overall. Salvia 'Victoria' is one specific cultivar that performed well in the 1993 trials.

Salvia represented about 3 percent of the 1993 U.S. market for bedding plants. About 20 percent of bedding plant growers/marketers considered them to be excellent items.

Table 16. *Salvia* cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|-----------|---------------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| coccinea | Lady In Red | AAS | 15.0 | 23.0 | 12.2 | 19.0 | 3.4 | 6 | 4 | 8 | 10 | 2 |
| farinacea | Argent White | CL | — | 22.5 | — | 13.0 | 7.0 | — | — | 8 | 9 | 6 |
| farinacea | Rhea Blue | CL | — | 17.0 | — | 8.0 | 5.5 | — | — | 5 | 7 | 5 |
| farinacea | Silver | JS | 23.0 | 16.0 | 13.5 | 20.0 | 4.1 | 7 | 7 | 6 | 8 | 5 |
| farinacea | Victoria | CL,JS,TM | 25.0 | 19.4 | 19.5 | 14.4 | 5.6 | 8 | 8 | 6 | 9 | 6 |
| splendens | Firecracker Blue | GR | 8.0 | — | 10.5 | — | — | 2 | 4 | — | — | — |
| splendens | Landscaper Bright Scarlet | GR | 7.7 | 12.0 | 7.5 | 11.0 | 9.5 | 4 | 5 | 9 | 9 | 2 |
| splendens | Maestro Red | CL | — | 11.0 | — | 7.3 | 6.5 | — | — | 7 | 4 | 2 |
| splendens | Scarlet Pimpernel | RS | 9.2 | 12.0 | 9.5 | 10.0 | 3.3 | 4 | 5 | 7 | 5 | 2 |
| splendens | Scarlet Queen | RS | 8.2 | 11.0 | 10.5 | 9.0 | 3.4 | 6 | 5 | 6 | 5 | 2 |
| splendens | Scarlet Signal | RS | — | 10.0 | — | 11.0 | 5.3 | — | — | 7 | 5 | 2 |

*Salvia* 'Lady in Red'

Derived from a western wildflower, this plant takes heat and drought while continuing to open its scarlet flowers. The flower spike is airier and more open than standard salvias, and is produced in about 13 weeks from sowing. This was a 1992 All-America Selection.

¹ See Source List for seed source (key). ² Mature height including flowers; site average. ³ Length of spike; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral and foliage quality.

SNAPDRAGON

More than 200 hybrid snapdragon (*Antirrhinum*) cultivars are currently available. They have strong lengthy stems that are topped by long flower heads containing closely spaced blooms which give the appearance of a spike. Flowers can be red, pink, yellow, orange, bronze, white or bicolor.

Snapdragons are exceptionally vigorous. They grow quite uniformly, and are largely resistant to disease. Some snapdragons can stand up well to strong winds, but taller cultivars need to be staked. Snapdragons require

sun, like cool temperatures and can survive severe frosts.

For snapdragons to flower through summer heat, seeds must be started early, about 11 weeks before the last frost, so that plants are well established before hot weather arrives. A fine soil or starting mix should be used and the seeds barely covered. Seedlings should be transplanted once into small pots for additional growth before going into the garden.

Plants can range from 6-inch dwarves to

30-inch giants. Tall upright cultivars will grow bushier if the main shoot is nipped off when the plants are about six inches high. To continue its blooms, a flower head should be cut back to the branch below as soon as the last flower of a stalk drops.

Snapdragon has held about 2 percent of the U.S. market for bedding plants since 1991. The National Garden Bureau is celebrating 1994 as the 'Year of the Snapdragon.'

Table 17. Snapdragon cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|---------------------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|------|----------|------|--------------|-----|------|
| | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | | | | | | | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | 10/5 |
| Liberty Cherry | GO | 20.0 | 25.0 | — | 12.2 | 7.5 | — | — | 4 | 4 | 10 | 8 | — | — | — |
| Liberty Crimson | GO | 23.0 | 21.0 | — | 13.5 | 9.0 | — | — | 5 | 5 | 8 | 7 | — | — | — |
| Liberty Lavender | GO | 19.0 | — | 13.0 | 11.0 | — | 10.0 | 11.0 | 6 | 5 | — | — | 9 | 5 | 6 |
| Liberty Light Pink | GO | 22.0 | 19.5 | 12.0 | 10.0 | 8.0 | 9.0 | 12.0 | 4 | 4 | 8 | 10 | 8 | 6 | 6 |
| Liberty Rose Pink | GO | 18.0 | 21.0 | 13.0 | 15.0 | 11.0 | 12.0 | 12.0 | 6 | 4 | 8 | 8 | 7 | 6 | 6 |
| Royal Carpet Pink | AT | — | 22.0 | 10.0 | — | 7.0 | 16.0 | 9.0 | — | — | 9 | 10 | 8 | 6 | 6 |
| Sonnet Pink | SK | 16.0 | — | 9.0 | 8.5 | — | 9.0 | 9.0 | 7 | 6 | — | — | 9 | 6 | 6 |
| Sonnet Rose | SK | 17.0 | — | 10.0 | 14.5 | — | 10.0 | 13.0 | 8 | 7 | — | — | 10 | 5 | 6 |
| Tahiti Appleblossom | SG | 6.5 | 9.0 | — | 11.0 | 10.0 | — | — | 4 | 2 | 9 | 7 | — | — | — |
| Tahiti Lilac | SG | 6.0 | 9.5 | 7.0 | 12.0 | 12.0 | 11.0 | 6.0 | 6 | 4 | 6 | 8 | 7 | 6 | 6 |
| Tahiti Mauve | SG | 7.5 | 9.5 | — | 11.5 | 11.0 | — | — | 6 | 4 | 6 | 2 | — | — | — |
| Tahiti Pink | SG | 7.7 | 6.0 | 8.0 | 13.2 | 10.0 | 12.0 | 6.0 | 5 | 5 | 9 | 5 | 8 | 5 | 6 |
| Tahiti Rose | SG | — | 10.5 | 6.0 | — | 12.0 | 8.0 | 5.0 | — | — | 10 | 2 | 9 | 5 | 6 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Length of spike; value given is average across sites. ⁴ Rating on 1 to 10 scale for floral display and foliage quality.

VERBENA

Clumped masses of clear, bright colors characterize verbena. These plants are noted for tolerating heat and drought. They are also noted for usually solid colored flowers, sometimes contrasted with a second colored eye in the center of each bloom.

Verbena grows to a height of between 8 and 16 inches, with trailing stems. The stems spread laterally and can root at the joints. It makes a very good flowering ground cover.

Verbena colors are typically blue, pink, red, white or purple. A new type entirely is the

'Imagination' cultivar which is among this year's All-American Selections.

Verbena cultivars generally fell victim to the cool weather of 1993, and quality was lower than usual overall at all three Minnesota test sites.

Propagation of verbena can be by either cuttings or seeds. The seeds take about two weeks to germinate in 65° F temperature. They should be started indoors in March for a mid-May outdoor planting. Pinching the main stem as it grows forces branching. Flowers too

should be pinched as they begin to fade, to prevent the plant from setting seeds.

Verbena requires full sun, and is drought and heat tolerant. It needs well drained soil.

Verbena represented only about 2 percent of the 1992 U.S. market for bedding plants, but it ranked among the ten best sellers of 1993.

Verbena 'Imagination'

A newer hybrid verbena, 'Imagination' has finely cut, grayish-green, lacy leaves that provide an excellent contrast to the brilliant violet flowers. Like most verbenas, it thrives on heat and sun, covering the ground with a rapid spreading habit. This was a 1993 All-American Selection.



Table 18. Verbena cultivars evaluated in the 1993 bedding plant trials at Morris, St. Paul, and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | | Plant Spread (inches) | | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | | | |
|-------------------------|--------------------------|------------------------------------|----------|--------------|-----------------------|----------|--------------|-----------------------------------|-------------------------------------|---|----------|---|--------------|---|---|
| | | Morris | St. Paul | Grand Rapids | Morris | St. Paul | Grand Rapids | | Morris | | St. Paul | | Grand Rapids | | |
| | | 8/11 | 9/14 | 8/3 | 9/21 | 8/19 | 9/7 | | 10/5 | | | | | | |
| Imagination | AAS,EB | 13.0 | — | 7.0 | 35.5 | — | 16.0 | — | 5 | 4 | — | — | 7 | 5 | 3 |
| Novalis Bright Scarlet | EB | 6.0 | — | 9.0 | 8.2 | — | 15.0 | 1.5 | 6 | 6 | — | — | 8 | 6 | 3 |
| Novalis Brilliant Rose | EB | 7.2 | 10.0 | 9.0 | 11.2 | 6.5 | 9.0 | 2.0 | 5 | 4 | 8 | 0 | 10 | 8 | 4 |
| Novalis Deep Blue w/Eye | AAS,EB | 11.0 | 8.0 | 8.0 | 12.0 | 12.0 | 10.0 | 2.0 | 7 | 4 | 8 | 7 | 9 | 7 | 3 |
| Novalis Light Scarlet | EB | — | 12.0 | — | — | 14.0 | — | 1.5 | — | — | 9 | 5 | — | — | — |
| Novalis Rose Pink w/Eye | EB | 9.0 | 13.0 | 8.0 | 9.5 | 8.0 | 9.0 | 2.0 | 4 | 5 | 7 | 3 | 7 | 7 | 4 |
| Novalis Rosy Red w/Eye | EB | 9.0 | 12.0 | 10.0 | 9.2 | 7.5 | 9.0 | 1.5 | 4 | 2 | 10 | 3 | 8 | 6 | 3 |
| Novalis White | EB | 10.0 | 10.0 | 13.0 | 20.5 | 6.0 | 16.0 | 2.0 | 6 | 5 | 8 | 6 | 9 | 7 | 4 |
| Peaches & Cream | AAS | 10.0 | — | 9.0 | 13.7 | — | 10.0 | 2.5 | 8 | 6 | — | — | 8 | 4 | 3 |
| Romance Carmine w/Eye | RS,SG | 7.5 | 7.0 | 4.0 | 12.2 | 7.0 | 7.0 | 1.5 | 6 | 2 | 8 | 5 | 5 | 3 | 3 |



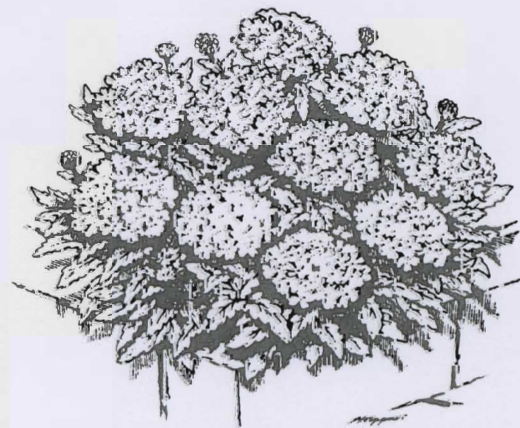
Verbena 'Peaches & Cream'

A new combination of colors for the verbena is this pastel blend of apricot and salmon. Despite a delicate appearance, the plants are heat and drought tolerant. Seed can be difficult to start since germination requires darkness. It produces flowers in about 60 days. It was a 1992 All-America Selection.

| | | | | | | | | | | | | | | | |
|-----------------------|-------|------|-----|------|------|------|-----|-----|---|---|----|---|----|---|---|
| Romance Deep Rose | SG | 8.0 | 9.0 | 7.0 | 11.0 | 7.0 | 9.0 | 1.5 | 5 | 5 | 8 | 5 | 10 | 5 | 3 |
| Romance Scarlet | SG | 6.2 | 9.0 | 6.0 | 13.5 | 12.0 | 7.0 | 1.9 | 6 | 5 | 10 | 4 | 5 | 4 | 3 |
| Romance Scarlet w/Eye | SG | 6.7 | 8.5 | 7.0 | 14.0 | 8.0 | 6.0 | 1.4 | 5 | 4 | 10 | 5 | 4 | 4 | 3 |
| Romance Violet w/Eye | RS,SG | 11.0 | — | 10.0 | 12.7 | — | 9.0 | 2.0 | 7 | 3 | — | — | 9 | 6 | 3 |
| Romance White | SG | 5.5 | — | 5.0 | 11.0 | — | 6.0 | — | 4 | 3 | — | — | 5 | 3 | 3 |
| Sandy White | DL | 7.7 | — | 8.0 | 8.7 | — | 8.0 | 1.5 | 6 | 6 | — | — | 7 | 4 | 3 |

Verbena 'Sandy White'

An All-America Selection from 1989, this verbena is an excellent low-growing plant for a hot, sunny border. The flowers are a shining, pure white, and they contrast well with its bright green foliage.



¹See Source List for seed source key. ²Mature height including flowers; site average. ³Width of flower cluster; value given is average across sites. ⁴Rating on 1 to 10 scale for floral display and foliage quality.

ZINNIA

Zinnia is a native North American plant that originated in areas which now include the southwestern United States, Mexico and the nations of central America. The zinnia was originally a small, undistinguished wildflower gathered only for medicinal purposes. About 100 years of breeding has since turned it into plants with large, plush blooms in just about any color but blue.

Three different species cover the most common garden cultivars. These are *Zinnia elegans*, *Zinnia haageana* and *Zinnia angustifolia*.

folia. Among all the available cultivars, almost any plant size up to about 40 inches can be found.

Zinnia seeds are large and easily sown. They germinate quickly and in high percentages. They don't require very much care, and they bloom prolifically from mid-summer through to the killing frost. New flower buds open even as mature flowers remain in their prime.

Zinnias need full sun in order to produce

plants with strong stems, many flowers, and resistance to diseases such as powdery mildew. They also need well drained soil.

Zinnias accounted for only about 2 percent of the 1993 U.S. market for bedding plants, and it was considered to be an excellent seller by only 13 percent of bedding plant growers/marketers, probably because it is so easy for home gardeners to grow from seed.

Table 19. Zinnia cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Type | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|-------------------|--------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| Star White | angustifolia | PA,PM | 14.0 | 10.0 | 19.0 | 19.0 | 1.3 | 6 | 6 | 5 | 6 | 2 |
| Dreamland Coral | elegans | AT | 14.0 | 13.0 | 11.0 | 10.0 | 2.8 | 6 | 6 | 7 | 5 | 2 |
| Dreamland Ivory | elegans | AT | 15.0 | 17.0 | 10.2 | 12.0 | 3.0 | 5 | 4 | 7 | 8 | 2 |
| Dreamland Pink | elegans | AT | 14.0 | 12.0 | 11.5 | 14.0 | 2.6 | 6 | 6 | 8 | 6 | 2 |
| Dreamland Rose | elegans | AT | 13.0 | 14.0 | 12.0 | 15.0 | 2.9 | 6 | 5 | 9 | 6 | 2 |
| Dreamland Scarlet | elegans | AT | 17.0 | 13.0 | 15.0 | 10.0 | 3.4 | 6 | 6 | 8 | 8 | 2 |
| Dreamland Yellow | elegans | AT | 12.0 | 12.0 | 10.0 | 12.0 | 3.4 | 4 | 5 | 8 | 7 | 2 |
| Peter Pan Mixture | elegans | GO | 15.0 | 14.0 | 12.5 | 12.0 | 2.8 | 8 | 6 | 8 | 7 | 2 |
| Scarlet | elegans | NK | 29.0 | 13.0 | 17.5 | 6.0 | 3.1 | 8 | 5 | 6 | 6 | 2 |
| Scarlet Splendor | elegans | AAS | 20.0 | 25.0 | 9.0 | 17.0 | 4.5 | 7 | 6 | 9 | 8 | 2 |
| Sunbow Mix | elegans | JS | 24.0 | 16.0 | 15.2 | 14.0 | 1.6 | 6 | 4 | 8 | 10 | 2 |

Zinnia 'Scarlet Splendor'

Large 4- to 5-inch semi-ruffled red flowers on smaller plants allows this cultivar to create super impact in a small garden. This is also a good plant to grow in a container. The flowers have good stems for cutting. A plant which is always easy to grow, salable zinnia packs can be anticipated about five weeks after sowing. This was a 1990 All America Selection.



¹See Source List for seed source key. ²Planture height including flowers; site average. ³Width of flower head; value given is average across sites. ⁴Rating on 1 to 10 scale for floral display and foliage quality.

OTHER MISCELLANEOUS BEDDING PLANTS

Although the U.S. bedding plant market is dominated by large sales of a few plants such as impatiens, petunias, and geraniums, a significant demand does exist for annuals that are unusual, that are not so common in gardens or that offer a new look for a land-

scape. Some perennials that flower the first year from seed are also of interest. Many of these are not new to the trade, but seem new to many gardeners.

number of these different species each year, taking a look at both old and new cultivars. This year's trials included some unusual flowers such as *Nolana*, *Salpiglossis* and ornamental sunflowers (*Helianthus*).

The Minnesota cultivar trials incorporate a

Table 20. Other miscellaneous bedding plant cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|------------------------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| <i>Achillea</i>⁵ | | | | | | | | | | | |
| Summer Pastels | AAS | 20.0 | 22.0 | 17.5 | 22.0 | 3.0 | 6 | 6 | 8 | 10 | 5 |

| | | | | | | | | | | | |
|---|----|------|---|------|---|-----|---|---|---|---|---|
| <i>Begonia, tuberosa</i>¹ | | | | | | | | | | | |
| Garland Illumination Orange | EB | 11.0 | — | 10.0 | — | 3.2 | 6 | 4 | — | — | — |



***Achillea* 'Summer Pastels'**

This cultivar is an improved yarrow which is easy to grow almost anywhere. It has a dwarf growth habit and produces a wide range of soft pastel flower colors. It is a perennial that can be grown as a green bedding plant in about 12 weeks from seed. This was a 1992 All-America Selection.

| | | | | | | | | | | | |
|---------------------------------|----|------|-----|------|------|-----|---|---|---|---|---|
| <i>Candytuft, annual</i> | | | | | | | | | | | |
| Dwarf Fairy | TM | 9.2 | — | 10.0 | — | 1.2 | 3 | 2 | — | — | — |
| Fairy Mix | NK | 12.0 | 9.0 | 12.5 | 12.0 | 1.1 | 3 | 2 | 7 | 8 | 3 |

| | | | | | | | | | | | |
|----------------------------------|-----|------|------|------|------|-----|---|---|---|---|---|
| <i>Cinnar</i>¹ | | | | | | | | | | | |
| Tropical Rose | AAS | 23.0 | 11.0 | 18.7 | 11.0 | 4.3 | 5 | 4 | 5 | 4 | 3 |

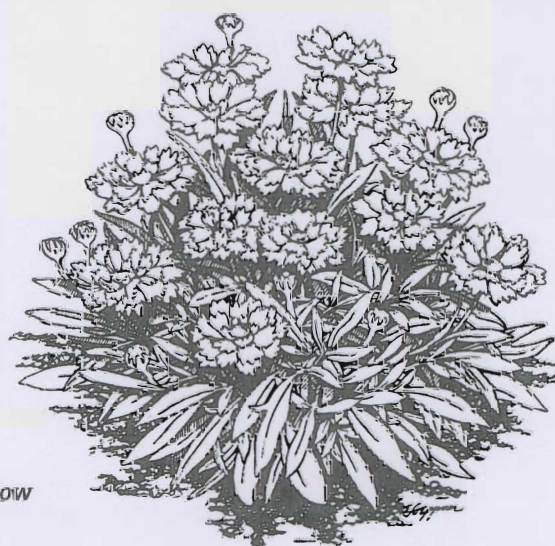
| | | | | | | | | | | | |
|-------------------------|----|------|-----|-----|-----|-----|---|---|---|---|---|
| <i>Carnation</i> | | | | | | | | | | | |
| Ball Experimental Mix | BA | — | 7.0 | — | 6.0 | 2.0 | — | — | 7 | 6 | 5 |
| Ball Experimental Red | BA | 9.2 | 7.0 | 7.2 | 5.0 | 1.4 | 4 | 2 | 6 | 8 | 5 |
| Ball Experimental White | BA | 10.0 | 8.0 | 6.2 | 8.0 | 1.9 | 6 | 2 | 0 | 9 | 5 |

Table 20 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|-----------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| <i>Celosia</i> | | | | | | | | | | | |
| Ballet Mixture | GR | 7.5 | 9.0 | 4.2 | 6.0 | 5.8 | 2 | 2 | 8 | 9 | 1 |
| Castle Pink | AAS | 7.2 | 9.0 | 4.5 | 7.0 | 4.8 | 2 | 2 | 7 | 7 | 1 |
| Chantal Mixed | RS | 5.5 | — | 3.7 | — | 5.0 | 2 | 2 | — | — | — |
| <i>Coleus</i> | | | | | | | | | | | |
| Landscaper Velvet | GR | 6.0 | 10.0 | 6.5 | 11.0 | 4.5 | 4 | 4 | 6 | 6 | 1 |

***Coreopsis* 'Early Sunrise'**

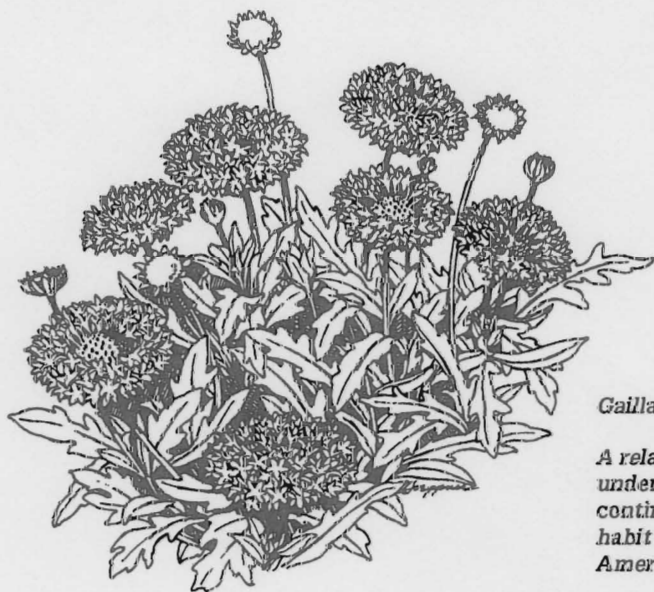
This plant was one of the first perennials to be recognized as an All-American Selection, in 1989. It blooms readily the first year from seed, if started early, and will be covered with bright yellow flowers until frost.



| | | | | | | | | | | | |
|-------------------------------------|-----|------|------|------|------|-----|---|---|----|---|---|
| <i>Coreopsis</i>^P | | | | | | | | | | | |
| Early Sunrise | AAS | 17.0 | 7.5 | 17.0 | 8.0 | 1.5 | 7 | 5 | 7 | 7 | 5 |
| <i>Cosmos</i> | | | | | | | | | | | |
| Bright Lights | NK | — | 32.0 | — | 23.0 | 1.5 | — | — | 9 | 7 | 1 |
| Sonata Mixed | RS | 27.0 | 25.0 | 26.5 | 24.0 | 3.3 | 5 | 2 | 9 | 4 | 1 |
| Sonata White | RS | 36.0 | 18.0 | 33.0 | 16.0 | 2.6 | 4 | 2 | 10 | 5 | 1 |
| Tickle Pink | GR | 34.0 | 31.0 | 19.0 | 38.0 | 2.1 | 4 | 2 | 8 | 5 | 1 |
| <i>Dahlia</i>^T | | | | | | | | | | | |
| Calico Mixture | CL | — | 10.0 | — | 7.0 | 2.0 | — | — | 7 | 7 | 1 |
| Caruso Red | GR | — | 17.0 | — | 17.0 | 2.0 | — | — | 7 | 6 | 1 |
| Figaro White | RS | — | 9.0 | — | 9.0 | 1.5 | — | — | 7 | 4 | 1 |
| Figaro Yellow Shades | RS | — | 9.0 | — | 12.0 | 1.5 | — | — | 5 | 5 | 1 |
| <i>Lychnis</i>^P | | | | | | | | | | | |
| Finesse | ES | — | 7.0 | — | 10.0 | — | — | — | 4 | 4 | 4 |
| Goldcut | ES | — | 7.0 | — | 8.8 | — | — | — | 5 | 4 | 4 |
| <i>Gaillardia</i> | | | | | | | | | | | |
| Red Plume | AAS | 17.0 | 8.0 | 23.0 | 10.0 | 2.1 | 8 | 7 | 7 | 6 | 1 |

Table 20 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread (inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|------------------------|--------------------------|------------------------------------|--------------|-----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| <i>Gazania</i> | | | | | | | | | | | |
| Chansonette | RS | 9.5 | 7.0 | 10.5 | 9.0 | 2.0 | 4 | 2 | 9 | 7 | 2 |
| Talent Mixture | EB | 9.5 | 7.0 | 13.5 | 7.0 | 2.5 | 6 | 4 | 7 | 7 | 2 |
| Talent Yellow | EB | 7.0 | 7.0 | 13.7 | 9.0 | 1.8 | 6 | 4 | 8 | 8 | 2 |
| <i>Godetia</i> | | | | | | | | | | | |
| Dwarf Satin Deep Rose | SK | 11.0 | — | 8.0 | — | 2.7 | 2 | 2 | — | — | — |
| Dwarf Satin Lavender | ST | 9.5 | — | 8.0 | — | 2.5 | 2 | 2 | — | — | — |
| Dwarf Satin Lilac Rose | ST | 11.0 | — | 8.5 | — | 2.7 | 2 | 2 | — | — | — |
| Dwarf Satin Pink | SK | — | 3.0 | — | 3.0 | — | — | — | 3 | 1 | — |
| Dwarf Satin Red | SK | — | 1.0 | — | 3.0 | — | — | — | 4 | 1 | — |
| Dwarf Satin Salmon | SK | 7.7 | — | 9.0 | — | 2.7 | 2 | 2 | — | — | — |




Gaillardia pulchella 'Red Plume'

A relatively new garden plant, 'Red Plume' is a superior performer under hot and dry growing conditions. It produces large red flowers continuously through the season. It has a compact, branching growth habit and does not require pinching or pruning. This was a 1991 All-America Selection.

| | | | | | | | | | | | |
|-------------------------|----|------|------|------|------|------|---|---|---|---|---|
| <i>Gomphrena</i> | | | | | | | | | | | |
| Gnome Rose | SK | 6.5 | — | 5.7 | — | 0.7 | 6 | 6 | — | — | — |
| Gnome White | SK | 6.0 | — | 5.2 | — | 0.7 | 5 | 4 | — | — | — |
| Woodcreek Lavender | BA | 13.0 | — | 11.0 | — | 0.5 | 6 | 5 | — | — | — |
| Woodcreek Lilac | ST | 12.0 | — | 11.0 | — | 0.7 | 6 | 6 | — | — | — |
| Woodcreek Red | BA | 14.0 | — | 12.5 | — | 0.7 | 4 | 6 | — | — | — |
| Woodcreek White | ST | 12.0 | — | 10.5 | — | 0.7 | 4 | 3 | — | — | — |
| <i>Melanthus</i> | | | | | | | | | | | |
| Floristan | EB | — | 47.0 | — | 16.0 | 20.0 | — | — | 8 | 5 | 1 |
| Halle | EB | — | 66.0 | — | 23.5 | 15.0 | — | — | 8 | 9 | 2 |
| Valentin | EB | — | 66.0 | — | 22.5 | 13.0 | — | — | 7 | 8 | 2 |
| <i>Hibiscus</i> | | | | | | | | | | | |
| Disco Belle Mixed | SK | — | 18.0 | — | 19.0 | — | — | — | 6 | 4 | 1 |
| Disco Belle Pink | SK | — | 18.0 | — | 19.0 | — | — | — | 6 | 4 | 1 |

Table 20 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1993 bedding plant trials at Morris and Grand Rapids.

| Cultivar | Seed Source ¹ | Plant Height (inches) ² | | Plant Spread(inches) | | Flower Size (inches) ³ | Overall Quality Rating ⁴ | | | | |
|--|--------------------------|------------------------------------|--------------|----------------------|--------------|-----------------------------------|-------------------------------------|------|--------------|-----|------|
| | | Morris | Grand Rapids | Morris | Grand Rapids | | Morris | | Grand Rapids | | |
| | | | | | | | 8/11 | 9/14 | 8/19 | 9/7 | 10/5 |
| <i>Lobelia</i> | | | | | | | | | | | |
| Palace Blue Eye | BS | 9.5 | — | 17.5 | — | 0.2 | 6 | 6 | — | — | — |
| Palace Blue Improved | BS | 6.2 | — | 11.0 | — | 0.5 | 4 | 2 | — | — | — |
| Palace Royal | BS | 8.5 | — | 14.0 | — | 0.5 | 5 | 2 | — | — | — |
| Palace White | BS | 7.0 | — | 9.0 | — | 0.5 | 2 | 2 | — | — | — |
| Rapid Blue | RS | 5.2 | — | 10.0 | — | 0.5 | 4 | 2 | — | — | — |
| <i>Nierembergia</i> | | | | | | | | | | | |
| Mont Blanc | AAS | 7.2 | 6.0 | 18.2 | 15.0 | 1.0 | 6 | 4 | 10 | 9 | 5 |
| <p><i>Nierembergia 'Mont Blanc'</i></p> <p>The first white <i>nierembergia</i> from seed, 'Mont Blanc' combines heat, drought, and severe weather tolerance with delicate, demure good looks. The plant is low, only nine inches at most, and spreading. Plan on ten to 17 weeks from seed to flower. This is a 1993 All-America Selection.</p> | | | | | | | | | | | |
|  | | | | | | | | | | | |
| <i>Nolana paradoxa</i> | | | | | | | | | | | |
| Cliffhanger | GR | — | 7.0 | — | 26.5 | — | — | — | 4 | 4 | 2 |
| <i>Papaver</i> | | | | | | | | | | | |
| Garden Gnome | EB | — | 13.0 | — | 9.0 | 1.5 | — | — | 7 | 8 | 4 |
| Partyfun | EB | — | 14.0 | — | 12.0 | 3.0 | — | — | 7 | 7 | 3 |
| <i>Salpiglossis</i> | | | | | | | | | | | |
| Casino Mixed | TM | — | 15.0 | — | 12.0 | 7.0 | — | — | 9 | 6 | 2 |
| <i>Sanvitalia</i> | | | | | | | | | | | |
| Double Sprite Yellow | RS | — | 8.0 | — | 13.0 | — | — | — | 9 | 6 | 1 |
| <i>Vinca</i> | | | | | | | | | | | |
| Hot Streak Salmon | GR | — | 11.0 | — | 8.0 | 0.5 | — | — | 4 | 4 | 2 |
| Parasol | AAS | 12.0 | 11.0 | 8.0 | 11.0 | 1.2 | 3 | 3 | 5 | 6 | 2 |
| Pretty In Rose | AAS | 6.0 | 8.0 | 8.5 | 9.0 | 1.1 | 4 | 4 | 5 | 6 | 2 |
| Pretty In White | AAS | 9.2 | 8.0 | 7.5 | 8.0 | 0.9 | 4 | 4 | 5 | 6 | 2 |

¹ See Source List for seed source key. ² Mature height including flowers; site average. ³ Width of single blossom or flower head except for Achillea and Candytuft (width of flower cluster) and for Celosia, Coleus and Salpiglossis (length of spike). ⁴ Rating on 1 to 10 scale for floral display and foliage quality. n/a under 'type' indicates not applicable. ^p Herbaceous perennial.

[†] Tender tuberous-rooted perennial

Source List. Sources of seeds for the 1991 bedding plant trials.

| Code | Company Name | Address |
|------|----------------------------------|--|
| AAS | All-America Selection Trials | 1311 Butterfield Road, Suite 310, Downers Grove, IL 60515 |
| AT | American Takii, Inc. | 301 Natividad Road, Salinas, CA 93906 |
| BA | George J. Bail, Inc. | PO Box 335, West Chicago, IL 60185 |
| BS | Bodger Seed, Ltd. | 1800 North Tyler Avenue, South El Monte, CA 91733 |
| BU | W. Atlee Burpee Company | 300 Park Avenue, Warminster, PA 18974 |
| CL | Clause Semences Professionnelles | 100 Breen Road, San Juan Bautista, CA 95045 |
| DN | Denholm Seeds | P.O. Box 438, West Chicago, IL 60185 |
| EB | Ernest Benary | P.O. Box 1127, Menden, Germany |
| GCG | Glass Corner Greenhouse | 3525 Bristol NW, Grand Rapids, MN 48504 |
| GO | Goldsmith Seeds, Inc. | 2280 Hecker Pass Highway, P.O. Box 1349, Gilroy, CA 95020 |
| GR | G.S. Grimes | 201 West Main Street, Smethport, PA 16749 |
| HM | Harris Seed Company | 60 Saginaw Drive, P.O. Box 22960, Rochester, NY 14692-2960 |
| JS | Johnny's Select Seed | Box 299, Foss Hill Road, Albion, ME 04910 |
| JU | J.W. Jung Seed Company | 335 South High Street, Randolph, WI 53957 |
| LB | Liberty Seed Company | P.O. Box 806, New Philadelphia, OH 44663 |
| MB | Malmberg's, Inc. | 5120 North Lilac Drive, Brooklyn Center, MN 55429 |
| NI | Nichols Garden Nursery | 1190 North Pacific Highway, Albany, OR 97321-4598 |
| NK | Northrup King Company | 7500 Olson Memorial Highway, Golden Valley, MN 55427 |
| PA | Park Seed Company | P.O. Box 31, Greenwood, SC 29646 |
| PM | Pan American Seed Company | P.O. Box 438, West Chicago, IL 60185 |
| RS | Royal Sluis | 1293 Harkins Road, Salinas, CA 93901 |
| SH | Shepard's Garden Seeds | 6116 Highway 9, Felton, CA 95018 |
| SG | Sluis & Groot | 7337 West Jefferson, Suite 250, Fort Wayne, IN 46840 |
| SK | Sakata Seed America, Inc. | P.O. Box 6007, Salinas, CA 93912-6007 |
| ST | Stokes Seeds, Inc. | 737 Main Street, Box 548, Buffalo, NY 14240 |
| TM | Thompson & Morgan | P.O. Box 1308, Jackson, NJ 08527 |
| TW | Twilliey Seeds Company, Inc. | P.O. Box 65, Trevese, PA 19047 |
| VS | Vaughans Seed Company | 5300 Katrine Avenue, Downers Grove, IL 60515 |