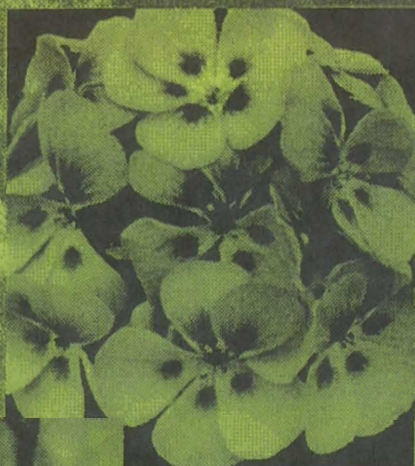


1992 Edition

CULTIVAR TRIALS

OF BEDDING PLANTS



UNIVERSITY OF MINNESOTA

Minnesota Report 224-1992 (AD-MR-5641-E)
Minnesota Agricultural Experiment Station

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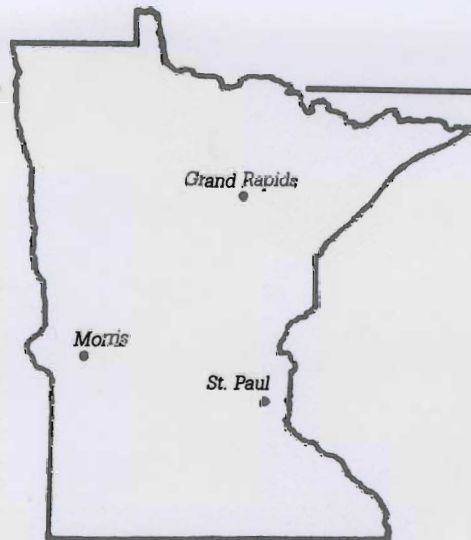
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CULTIVAR TRIALS OF BEDDING PLANTS



Test locations for the cultivar trials reported in this publication.

Continued growth of over 15% 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 1991 only; cultivars may have performed quite differently in previous years. For results from earlier trials, contact the site supervisor directly. 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 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).

Acknowledgements

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

Cultivar trials in 1991 at St. Paul, Morris, and Grand Rapids were supervised by Robert Mullin, Steven R. Poppe, and David K. Wildung, respectively. Many thanks are due to 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. Cover background photo by Don Breneman.

Disclaimer

Reference 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

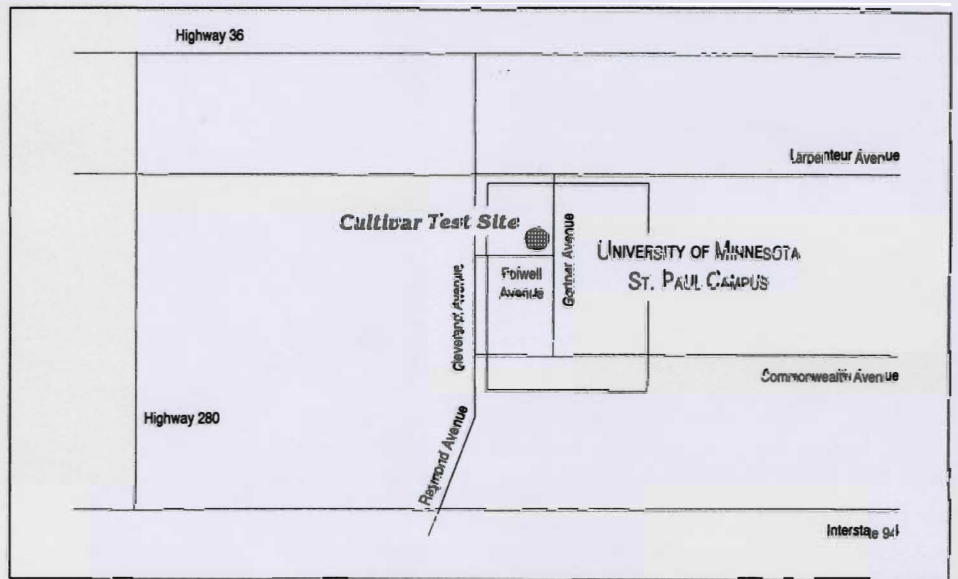
Department of Horticultural Science, St. Paul: The Garden

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. It is approximately 1.5 acres in size, equally divided between a woodland garden, a prairie garden and an annual-perennial garden. In 1991 there were approximately 400 annuals, 100 perennials and 150 native grasses and wildflowers on display across the garden site.

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.

The 1991 St. Paul area growing season was 149 days, which was 11 days fewer than



the annual average. The last spring frost was on May 24 and the first fall frost on September 20. Rainfall between May 1 and September 30 was 20.35 inches, which was 1.69 inches

above the annual average of 18.67 for that period. Temperatures were above average in June, but near normal for all other months of the growing season.

West Central Experiment Station, Morris

From 1910 through 1963, the experiment station at Morris shared facilities with the West Central School of Agriculture. When the 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 small fruit trials, home garden vegetable variety trials, soil conservation plant materials trials, USDA single row field windbreak test planting and annual flower trials.

Over 400 cultivars are on view at the West Central Experiment Station in a typical year. Program objectives are to evaluate flower bloom, size, color, frost resistance and quality characteristics; to evaluate plant growth, habit and disease characteristics, and to identify cultivars most suited for western Minnesota conditions.

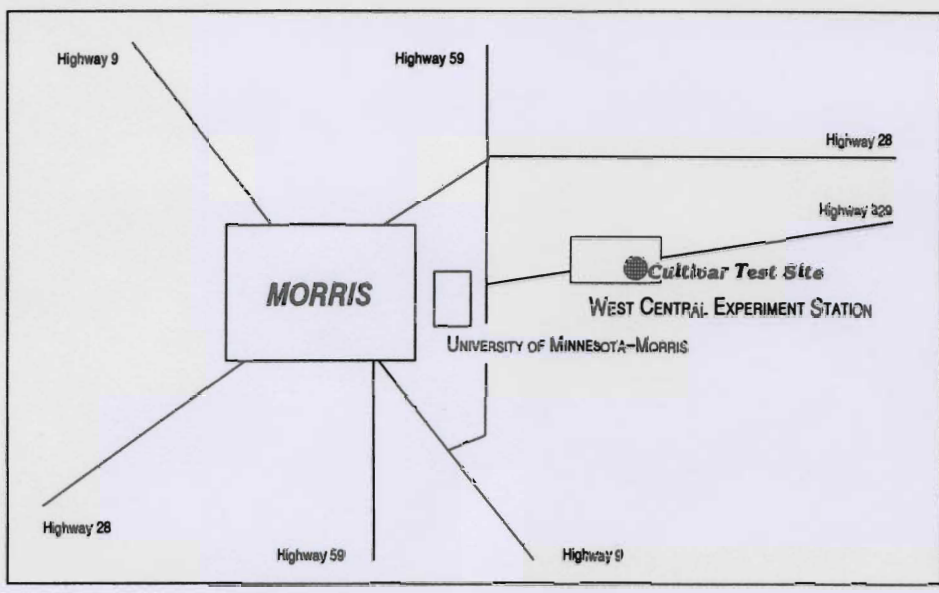
All the cultivars were grown in on-site greenhouses, the seeding date varying with plant type. In 1991, seedlings were transplanted to the field between May 29 and June 3, into rows 3 feet apart, 10 plants per plot on 1 foot centers. Soil on the trial site is very

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 and mechanical/hand weeding was applied as needed.

Greenhouse growth and development were normal and 1991 field performance was average. Wet periods during the season reduced growth and development, leading to the average results on some cultivars. Celosia, portulaca, verbena, salvia and gaillardia all showed below average performance.

The 1991 growing season was 165 days long (average is 156 days) with the last spring frost on April 24 and the first fall frost on October 25. Rainfall between May 1 and September 30 was 20.99 inches, 5.34 inches above the average of 15.65 inches for the season. Temperatures were above average in May and June, but below average in July, August and September.

Annual events at the West Central Experiment Station include Visitors Day, Horticulture Night and Bedding Plant Growers Day, all 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 vegetable production in northern Minnesota. Annual flower trials began in 1965, and have become a focal point for public tours. Over 400 cultivars are reviewed 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 suited for northern Minnesota conditions.

Cultivars are grown in on-site greenhouses; seeding date varies with plant type. In 1991, all seedlings were transplanted to the field on June 18 or 19, into rows 4 feet apart, with 10 plants per plot on 1 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 5, plots were banded

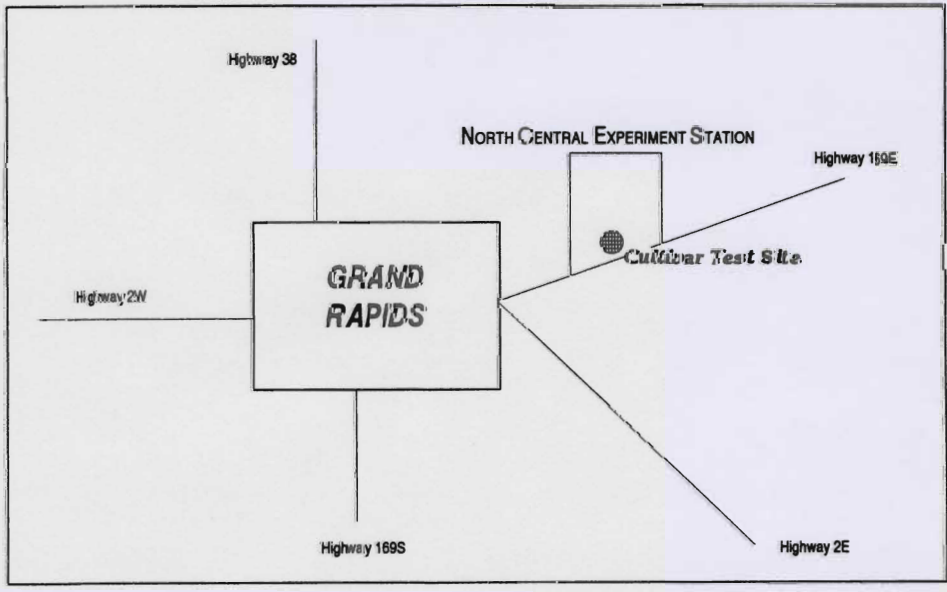
with 33-0-0 at 120 pounds per acre. Insecticide was applied to nicotiana (7/23) to control Colorado potato beetle, and to marigolds and petunias (7/26 and 8/6) to control aster leafhopper. Overhead irrigation and mechanical or hand weeding was applied as needed.

Greenhouse growth and development were normal, and 1991 field performance was good. Warmer than average night temperatures promoted good development of geraniums, petunias and nicotiana. Farinčina salvias performed very well. Pansies did very well late in the summer, providing very good color as late as October 24 after several very hard freezes. The 1992 All America Selection 'Peaches and Cream' verberna was outstanding.

Despite insecticide applications and weekly removal of diseased plants, aster yellows was a serious problem. It caused poor performance in most marigolds and was evident in vincas, petunias, verberna, statice and splendans salvias as well.

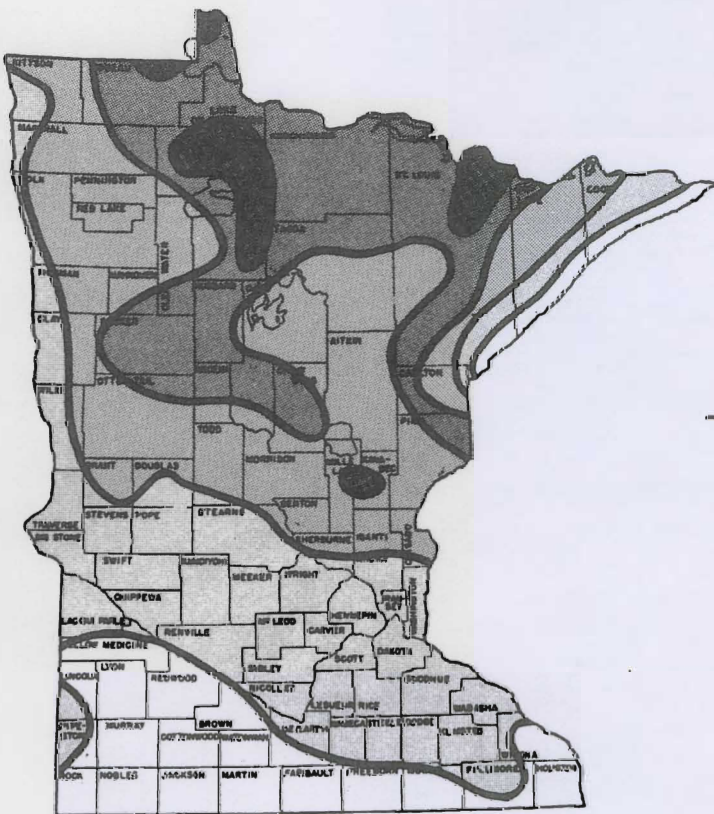
The 1991 growing season was 123 days long (average is 110 days) with the last spring frost on May 20 and the first fall frost on September 20. Rainfall between May 5 and September 29 was 15.1 inches, 3.6 inches below the 17.7 inch average for the season. Temperatures were below average in July and September, but above average in May, June, and August.

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



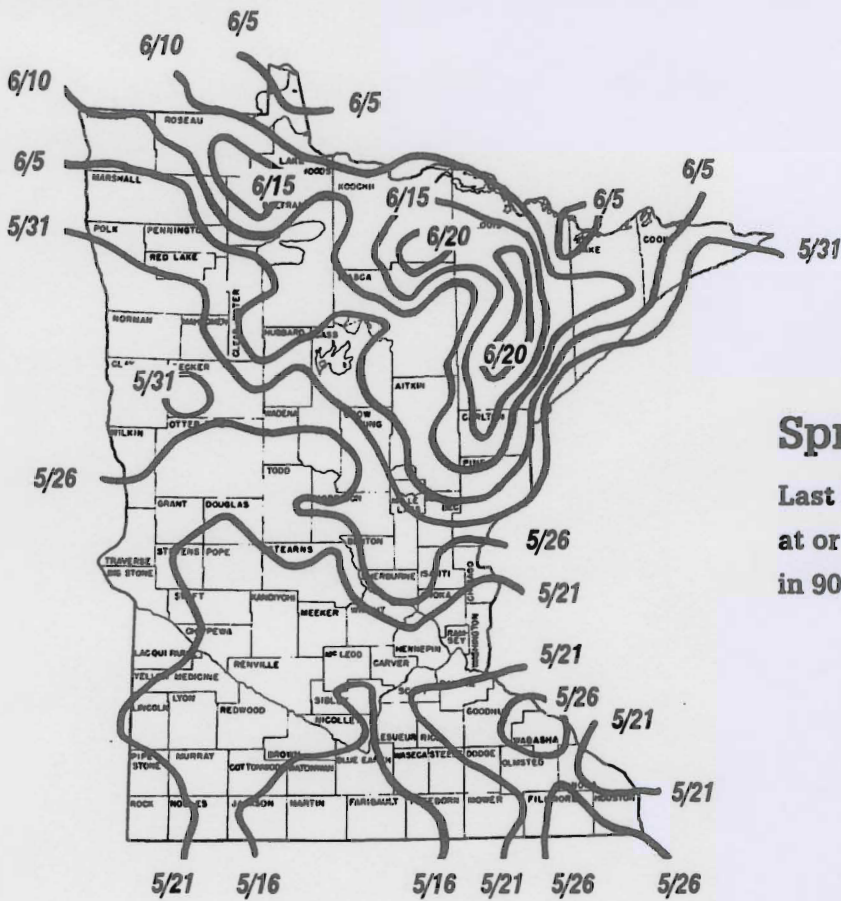
CLIMATOLOGICAL INFORMATION

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

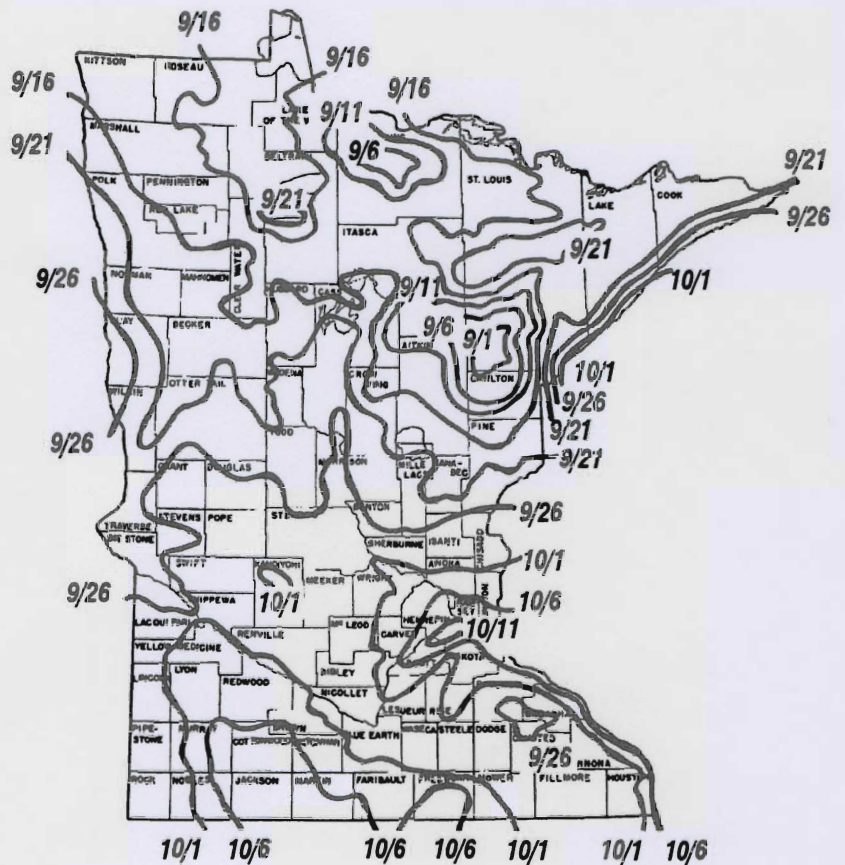


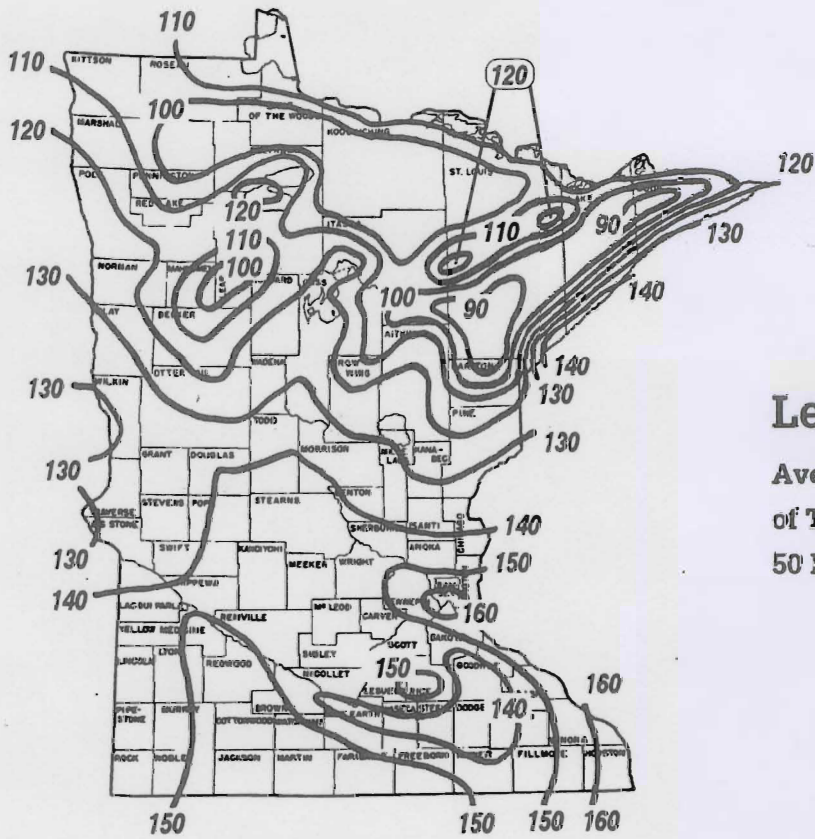
Spring Frost Date

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 50 Percent of Years



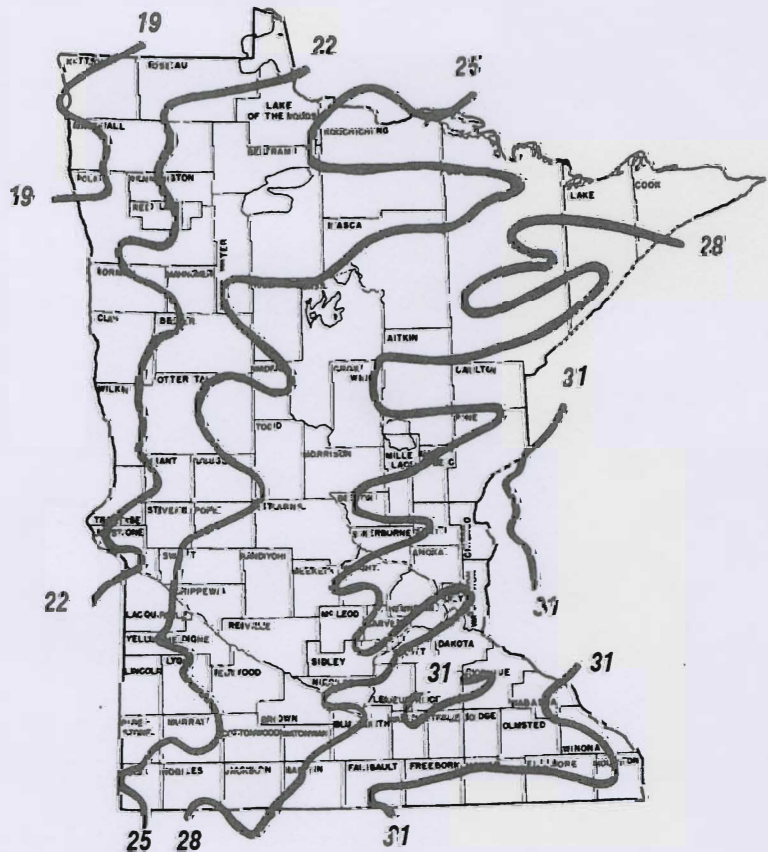


Length of Growing Season

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



BEGONIA

While the stronghold of fibrous begonia (*Begonia semperflorens*) and tuberous begonia (*Begonia tuberhybrida*) 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. 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. Colors include white, red and pink in fibrous begonias, plus orange, yellow and some with second color edging in tuberous forms.

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.

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 almost 6% of the total U.S. bedding plant crop in 1991. Among growers/marketers, 83% rated them to be good or excellent items.

Minnesota's begonia trials were only conducted at the St. Paul site in 1991.

Table 1. Begonia cultivars evaluated in the 1991 bedding plant trials at St. Paul.

Cultivar	Type	Source ¹	Plant Height (inches) ²	Flower Width (inches) ³	Overall Plant Quality ⁴		
					6/22	8/6	9/6
Athena Blanc	fibrous	CL	17	1.0	8	8	8
Athena Mix	fibrous	CL	15	0.3	7	8	8
Athena Rose	fibrous	CL	10	1.2	9	10	8
Athena Rose Tendre	fibrous	CL	9	1.2	6	10	8
Athena Scarlet	fibrous	CL	13	1.2	8	10	9
Hot Tip Rose	fibrous	GR	14	1.2	9	9	8
Marathon Scarlet	fibrous	RS	10	1.0	7	9	9
Minstrel Mix	fibrous	SG	11	0.3	7	9	8
Rio Mix	fibrous	SG	10	1.1	7	10	10
Rio Pink	fibrous	SG	10	1.1	8	9	10
Rio Rose	fibrous	SG	9	1.1	6	9	8
Rio Scarlet	fibrous	SG	10	1.1	7	8	8
Rio White	fibrous	SG	9	1.0	5	8	8
Roxy Mix	fibrous	RS	8	1.1	8	9	9
Roxy Scarlet	fibrous	RS	9	1.0	7	10	9
Stara Rose Clair	fibrous	CL	16	0.3	7	8	8
Stara Rose Fonce	fibrous	—	15	1.0	6	8	7
Swing Pink	fibrous	RS	8	1.1	7	9	9
Swing Rose	fibrous	RS	9	1.2	7	9	9
Swing Scarlet	fibrous	RS	15	1.2	8	8	8
Swing White	fibrous	RS	11	1.0	8	9	9
Varsity Formula Mixture	fibrous	SG	11	1.1	6	10	10
Varsity Scarlet	fibrous	SG	13	1.1	9	10	8
Varsity White	fibrous	SG	9	1.0	6	9	9
Chanson Copper Red	tuberous	RS	17	4.1	5	6	5
Chanson Light Red	tuberous	RS	13	3.2	5	7	6

Table 1 (continued). Begonia cultivars evaluated in the 1991 bedding plant trials at St. Paul.

Cultivar	Type	Source ¹	Plant Height (inches) ²	Flower Width (inches) ³	Overall Plant Quality ⁴		
					6/22	8/6	9/6
Rose Pink	tuberous	—	15	2.3	6	8	6
Spirit Apricot	tuberous	RS	10	3.2	8	9	9
Spirit Pink Shades	tuberous	RS	10	2.3	8	8	8
Spirit Red Shades	tuberous	RS	9	3.1	7	9	9
Spirit Yellow Shades	tuberous	RS	9	2.3	8	8	8

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.

CELOSIA

Celosia has grown in popularity as new forms have been developed by American and Japanese plant breeders. Cultivars can differ in having either tall feathery plumes (*Celosia plumosa*) or broad colorful combs (*Celosia cristata*).

Celosias can be direct seeded into gardens or can be sown early indoors for transplants. Celosia seed should be scattered thinly and kept warm to maximize germination, and seedlings should be transplanted into pots as soon as possible to avoid crowding.

Seed should be started indoors about six weeks ahead of planting time to obtain early color. They should not be planted outdoors until the weather is consistently warm in the

spring. Direct seeded garden plants will not bloom until midsummer.

Celosias can be yellow, orange, red, cream or pink. Given sufficient growing space, some cultivars can grow to sturdy three foot high bushes. Dwarf types can be planted 6 to 8 inches apart. Tall and large cultivars may need up to 24 inches of space.

Both plumosa and cristata types can be timed to flower from June through September. The plant requires locations with full sun. High temperature and shorter days hasten blooming.

Celosias are generally low maintenance plants, relatively free of diseases and pests, and tolerant of hot, dry sites. Wet weather

can be a problem. Cool weather can prevent flowering.

Mature stems and heads make excellent material for dried arrangements.

Bedding plant growers/marketers generally rated celosia at least fair (36%) in 1991, but mostly good or excellent (49%).

Celosia 'Century Red' was an outstanding performer at Grand Rapids in 1991.

Table 2. Celosia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Jessica Formula Mix	RS	—	8	7	7.0	—	—	—	8	8	6	4	5	3
Castle Pink	AAS	9	16	10	6.7	8	0	0	9	10	5	8	8	7
Castle Scarlet	BU	10	14	12	6.3	6	0	0	7	9	6	8	9	7
Century Red	PA	17	23	18	9.5	8	0	0	9	10	9	9	9	8
Chantal Carmine Red	RS	11	—	16	7.8	4	0	0	—	—	—	8	9	7
Chantal Mixed	RS	7	16	—	5.5	4	0	0	8	9	5	—	—	—
Chantal Salmon	RS	—	—	10	6.5	—	—	—	—	—	—	7	8	5
Chantal Scarlet	RS	9	—	16	7.5	6	0	0	—	—	—	8	9	7
Chantal Yellow	RS	6	—	—	4.5	3	0	0	—	—	—	—	—	—
Fire Dragon	BU	28	32	14	5.0	9	0	0	4	9	10	5	5	4

Table 2 (continued). Celosia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Kewpie Red	PA	9	17	14	5.2	6	0	0	7	10	10	9	9	8
Kimono Blush	SK	7	-	10	5.5	4	0	0	-	-	-	8	8	4
Kimono Cherry Red	SK	-	-	8	4.0	-	-	-	-	-	-	8	9	6
Kimono Cream	SK	6	12	-	4.0	4	0	0	10	8	6	-	-	-
Kimono Orange	SK	6	-	-	4.0	3	0	0	-	-	-	-	-	-

*Celosia 'Castle Pink'*

A sturdy heat, drought and rain tolerant plant, this is one of the few celosias recommended for landscape use. This was a 1990 All American Selection.

Kimono Red	SK	7	-	9	4.8	5	0	0	-	-	-	8	9	7
Kimono Rose	SK	3	-	7	4.0	1	0	0	-	-	-	7	8	4
Kimono Salmon	SK	-	-	9	5.5	-	-	-	-	-	-	8	9	3
Kimono Salmon Pink	SK	7	-	10	4.8	5	0	0	-	-	-	7	8	5
Kimono Scarlet	SK	7	-	8	4.8	6	0	0	-	-	-	7	7	3
Kimono Yellow	SK	6	-	-	3.5	3	0	0	-	-	-	-	-	-
New Look	AAS	13	-	18	5.3	8	0	0	-	-	-	7	8	7

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

DIANTHUS

Dianthus is a plant growing in both popularity and the availability of new cultivars. It has a fragrant flower with clear, vibrant colors. Dianthus types in the Minnesota trials consist of both china pinks (*Dianthus chinensis*) and carnations (*Dianthus caryophyllus*).

Dianthus flowers can usually be found in solids and combinations of white, pink, or red. Recent breeding efforts have extended its color range toward violet and purple. One of this year's All American selections is, in fact, '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 tempera-

tures, and can be depended on to bloom all summer and well into the fall. It requires a well drained soil and regular watering, and can withstand considerable frost.

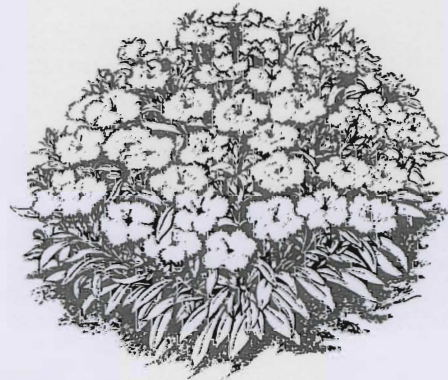
Dianthus held only about 1% of the 1991 U.S. market for bedding plants. However, most bedding plant growers/marketers (75%) considered it to be an excellent or good item.

Table 3. Dianthus cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	6/9	8/22	9/1
Ideal Violet	AAS	7	7	7	1.0	6	2	3	8	4	2	9	9	7
Knight Mix	GS	10	-	-	2.0	6	5	4	-	-	-	-	-	-
Knight, Crimson	GO	12	-	-	2.0	8	7	4	-	-	-	-	-	-
Knight, Orange	GS	10	-	-	2.0	8	5	4	-	-	-	-	-	-
Knight, Rose	GS	10	-	-	2.0	6	6	4	-	-	-	-	-	-
Knight, Scarlet	GS	13	-	-	2.0	8	6	4	-	-	-	-	-	-
Knight, White	GS	9	-	-	2.2	8	7	4	-	-	-	-	-	-
Lilliput Orange Bicolor	SK	8	-	7	1.9	7	2	2	-	-	-	6	7	6
Magic Charms Mix	GO	8	8	-	1.4	6	6	3	5	3	2	-	-	-
Princess Crimson	GO	8	7	10	0.9	8	3	3	8	4	3	8	8	7
Princess Salmon	GO	8	-	8	1.4	8	8	3	3	0	0	8	9	8
Princess Scarlet	GO	9	7	9	0.9	8	7	3	4	3	3	9	9	8
Princess White	GO	8	7	10	0.9	8	4	3	4	3	2	9	9	8
Telstar Picotee	SK	7	9	8	1.2	9	5	2	8	5	7	8	9	9

Dianthus F₁ 'Ideal Violet'

This cross between a sweet william and a Chinese pink has strong stems and good weather tolerance. Unique purple flowers appear 14 weeks after sowing. It does well in sunny, well-drained soil and needs little garden care. This is a 1992 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.

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 these early times 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.

Geranium flowers come in white, pink, red, salmon, lavender, and fuchsia. 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 10 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 warm,

most medium. Under these conditions, germination is as rapid as 7 to 10 days. Geranium seed should be started in Minnesota in mid-January to produce stocky, budding 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 16% of the total bedding plant crop in 1991, and were third in overall popularity among consumers, following impatiens and petunias. Bedding plant growers/marketers overwhelmingly

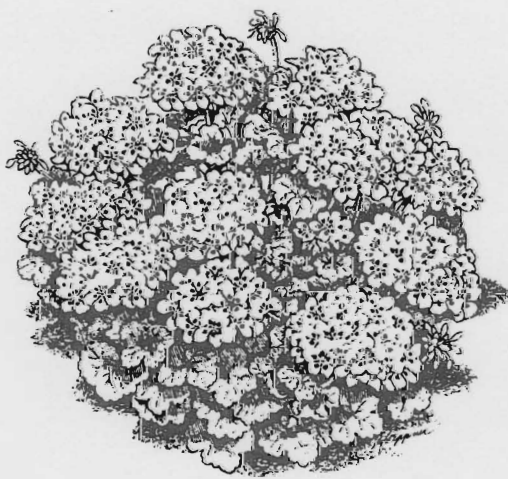
(85%) rated cutting geraniums as an excellent or good item; 64% felt the same about seed geraniums.

As usual, geraniums performed well at all trial sites in Minnesota this year. Ratings were lower than expected at Morris, however, due to the unusually wet weather. The 1991 trials focused on red, white, and bicolor cultivars, as well as several series. Top performers were 'Pinto White,' 'Freckles'

and 'Hot Pink Orbit' at Morris; 'Satellite Salmon Orange' at St. Paul; and 'Multibloom White,' 'Hollywood Star' and 'Pinto Red' at Grand Rapids.

Table 4. Geranium cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	8/22	8/6	9/6	8/9	8/22	9/1
Bright Eyes	GO	12	18	17	3.9	7	9	8	6	9	9	8	8	7
Challenge Pink	RS	-	14	-	3.3	-	-	-	8	9	9	-	-	-
Challenge White	RS	13	18	16	3.2	6	6	4	7	8	8	8	9	8
CL 31 Red	CL	-	-	13	3.8	-	-	-	-	-	-	7	9	9
CL 31 Rose Mauve	CL	-	-	14	4.3	-	-	-	-	-	-	8	10	8
CL 31 Salmon	CL	-	17	-	3.2	-	-	-	8	9	8	-	-	-
CL 31 Scarlet	CL	-	-	18	3.5	-	-	-	-	-	-	9	9	10
Elite Cherry	GO	10	14	13	3.4	6	5	4	8	8	9	8	9	8
Elite Pink	GO	8	14	-	3.6	7	7	6	8	9	9	-	-	-
Elite Red	GO	11	15	15	3.4	8	7	6	8	8	9	9	9	7
Elite Salmon	GO	10	17	-	3.2	6	5	5	7	7	9	-	-	-
Elite Scarlet	GO	9	18	15	3.3	6	5	6	8	8	9	8	9	8
Elite White	GO	10	15	15	3.2	5	5	4	6	7	9	8	9	8
Freckles	AAS	11	-	15	3.6	10	10	9	-	-	-	7	9	7
Geronimo	SG	12	-	-	3.0	7	5	5	-	-	-	-	-	-



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.

Hollywood Star	DM	11	-	14	3.3	7	6	7	-	-	-	8	8	9
Hollywood White	JIN	12	-	15	3.2	8	6	4	-	-	-	6	7	6
Merlin	GO	12	20	18	3.7	7	8	8	7	10	8	7	7	6
Multibloom Bright Rose	GO	12	-	-	3.0	7	5	4	7	8	8	-	-	-
Multibloom Lavender	GO	10	16	-	2.9	6	4	5	7	10	9	-	-	-

Table 4 (continued). Geranium cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Multibloom Pink	GO	10	13	-	3.1	9	6	7	7	9	8	-	-	-
Multibloom Red	GO	9	14	14	2.8	4	4	4	9	7	8	8	9	8
Multibloom Scarlet Eye	GO	10	12	14	3.3	6	6	5	7	9	9	9	9	8
Multibloom White	GO	12	16	14	3.3	5	6	5	6	9	7	8	9	8
Orbit Appleblossom	GO	-	15	-	3.3	-	-	-	7	7	8	-	-	-
Orbit Cardinal	GO	10	16	17	3.7	8	6	7	8	9	8	7	7	6
Orbit Cherry	GO	-	18	19	4.1	-	-	-	8	9	8	8	9	8
Orbit Coral	GO	10	15	18	3.3	6	6	6	8	8	9	8	9	8
Orbit Deep Salmon	GO	10	16	-	2.6	7	6	6	8	9	9	-	-	-
Orbit Glow	GO	-	15	12	3.9	-	-	-	6	9	9	8	8	8
Orbit Hot Pink	GO	12	13	-	3.4	9	9	8	7	9	9	-	-	-
Orbit Orchid	GO	-	13	-	4.1	-	-	-	5	9	8	-	-	-
Orbit Pink	GO	11	16	-	3.8	7	8	7	6	9	8	-	-	-
Orbit Red	GO	14	14	17	3.9	9	8	8	9	8	9	7	8	7
Orbit Rose	GO	11	15	-	3.9	7	6	7	8	9	10	-	-	-
Orbit Salmon	GO	11	14	-	3.1	6	6	6	6	7	8	-	-	-
Orbit Scarlet	GO	11	15	17	3.7	6	7	7	8	9	9	8	8	7
Orbit Scarlet Eye	GO	9	17	18	3.7	7	6	5	5	9	8	8	9	7
Orbit Violet	GO	11	14	-	3.4	6	5	5	6	8	9	-	-	-
Orbit White	GO	12	15	16	3.1	7	6	6	6	9	7	8	7	8
Picasso	SG	11	18	-	4.0	8	6	5	8	9	9	-	-	-
Pinto Bicolor	SG	12	15	18	3.4	7	5	5	7	9	9	9	9	8
Pinto Blush	SG	-	18	18	3.4	-	-	-	8	8	9	9	9	9
Pinto Quicksilver	SG	14	15	-	3.2	7	6	6	6	7	8	-	-	-
Pinto Red	SG	-	17	17	4.1	-	-	-	8	9	9	8	10	9
Pinto Rose	SG	-	16	-	4.3	-	-	-	8	9	10	-	-	-
Pinto Salmon	SG	-	16	-	3.3	-	-	-	8	8	9	-	-	-
Pinto Scarlet	SG	-	17	18	3.5	-	-	-	8	9	9	7	9	8
Pinto White	SG	17	18	18	3.4	9	9	6	7	8	9	8	10	9
Ringo Deep Scarlet	SG	-	18	19	3.9	-	-	-	7	8	9	7	7	7
Ringo Rose	SG	-	17	-	4.0	-	-	-	8	8	9	-	-	-
Ringo Salmon	SG	-	13	-	3.2	-	-	-	6	8	9	-	-	-
Ringo White	SG	11	18	17	3.4	5	5	4	6	8	9	7	8	8
Satellite Carmine	RS	-	18	-	3.3	-	-	-	8	9	9	-	-	-
Satellite Red/White	RS	-	19	20	4.0	-	-	-	9	9	9	8	8	7
Satellite Salmon Orange	RS	-	19	-	3.2	-	-	-	9	10	10	-	-	-
Satellite Salmon Pink	RS	-	13	-	3.1	-	-	-	6	7	8	-	-	-
Satellite Scarlet	RS	-	17	-	3.2	-	-	-	8	9	8	-	-	-
Signal Orange	CL	-	18	-	3.3	-	-	-	7	9	9	-	-	-
Sprinter White	GO	15	16	19	3.6	5	5	5	8	8	7	7	7	7

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

IMPATIENS

Impatiens, first found in East Africa in 1896, have gained widespread popularity as low maintenance bedding plants that bloom profusely throughout the summer.

Two outstanding cultivars were identified at the Morris trial sites in 1991: 'Accent Lavender Blue' and 'Impulse Violet.' Orange and salmon shades from many series were compared in that year's trials. The color range of impatiens blooms also includes white and many shades of reds and pinks.

While impatiens are easy to root from cuttings, 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.

Different cultivars grow to heights from 8 to 14 inches. Smaller dwarf plants that have more numerous flowers, and which do not need pinching, are growing in popularity.

Impatiens seeds need to be thinly sown 3/4 of an inch deep 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 (3 to 5 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.

Outdoors, 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 accounted for about 13% of the total bedding plant crop in 1991. It edged out petunias as the most popular among consumers, as it has done for the past several years. Among growers/marketers, 94% rated them to be good or excellent items. No other plant was rated that well by that many.

Table 5. Impatiens cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Accent Apricot	GO	5	12	-	1.5	5	5	4	7	10	9	-	-	-
Accent Bright Eye	GO	-	12	-	1.3	-	-	-	9	9	9	-	-	-
Accent Carmine	GO	8	-	-	1.7	7	8	6	-	-	-	-	-	-
Accent Coral	GO	-	16	9	2.0	-	-	-	9	9	9	9	9	10
Accent Deep Pink	GO	-	14	-	1.3	-	-	-	9	10	10	-	-	-
Accent Lavender Blue	GO	10	-	-	2.0	10	10	7	-	-	-	-	-	-
Accent Mix	GO	-	21	-	1.3	-	-	-	8	9	9	-	-	-
Accent Orange	GO	5	-	6	1.9	7	7	5	-	-	-	8	7	7
Accent Orange Star	GO	4	-	7	1.6	6	4	3	-	-	-	4	4	2
Accent Rose	GO	-	17	-	1.3	-	-	-	9	10	9	-	-	-
Accent Rose Star	GO	-	14	-	1.3	-	-	-	8	10	9	-	-	-
Accent Salmon	GO	6	19	14	1.8	7	7	5	9	10	8	6	5	6
Blitz Light Pink	BU	10	16	-	2.0	7	7	6	9	9	9	-	-	-
Blitz Mix	SG	-	20	-	2.1	-	-	-	9	10	10	-	-	-
Blitz Orange	SG	-	-	17	2.3	-	-	-	-	-	-	7	6	8
Blitz Red	SG	-	-	16	2.5	-	-	-	-	-	-	8	8	7
Blitz Rose	SG	-	16	-	2.1	-	-	-	9	8	9	-	-	-
Blitz Salmon	SG	10	20	12	1.8	8	10	8	9	10	9	5	6	7
Blitz White	SG	-	-	10	2.3	-	-	-	-	-	-	5	4	3
Confection Orange	HM	-	-	13	1.8	-	-	-	-	-	-	5	5	4
Dazzler Coral	BU	5	8	10	1.9	5	6	7	8	8	10	5	5	3
Dazzler Orange	BU	5	-	10	1.9	6	7	6	-	-	-	8	8	6
Futura Orange	PA	10	-	16	1.6	7	8	4	-	-	-	8	7	8
Hot Passion Mix	GR	-	12	-	1.3	-	-	-	8	8	6	-	-	-
Impulse Appleblossom	SG	8	-	-	2.0	7	6	5	-	-	-	-	-	-

Table 5 (continued). Impatiens cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	9/22	9/1
Impulse Mix	SG	-	12	-	2.1	-	-	-	9	8	9	-	-	-
Impulse Orange	SG	-	-	10	2.3	-	-	-	-	-	-	9	8	8
Impulse Orange Bicolor	SG	-	-	9	2.3	-	-	-	-	-	-	8	5	6
Impulse Pink	SG	6	9	-	1.8	6	8	6	7	8	7	-	-	-
Impulse Red	SG	7	-	-	1.7	8	8	7	-	-	-	-	-	-
Impulse Salmon-Orange	SG	5	11	6	1.9	7	7	6	9	10	10	5	6	5
Impulse Salmon-Rose	SG	7	11	8	1.7	8	8	8	9	8	10	9	7	6
Impulse Scarlet	SG	7	-	-	1.7	8	7	6	-	-	-	-	-	-
Impulse Violet	SG	10	-	-	1.7	10	10	7	-	-	-	-	-	-
Impulse White	SG	5	-	-	1.7	6	6	4	-	-	-	-	-	-
Mega Orange Star	GO	10	-	10	2.0	9	8	7	-	-	-	7	6	5
New Guinea Sp Mix	PA	-	-	9	2.0	-	-	-	-	-	-	6	4	6
Novette Orange Star	SG	6	-	9	1.9	6	6	5	-	-	-	5	5	6
Novette Rose Star	SG	-	11	-	1.3	-	-	-	7	8	6	-	-	-
Orange Gem	PA	10	-	7	1.8	8	10	7	-	-	-	7	7	6
Rosette Hybrid	PA	7	-	-	1.5	6	5	4	-	-	-	-	-	-
Salmon Orange	BA	-	-	7	2.0	-	-	-	-	-	-	9	7	4
Shady Lady Coral	PA	-	-	11	2.0	-	-	-	-	-	-	8	8	6
Splash Coral	HM	8	13	9	1.8	8	8	8	8	9	9	8	8	9
Splash Mix	HM	-	11	-	2.0	-	-	-	8	9	8	-	-	-
Splash Orange	HIM	6	-	9	2.0	6	7	6	-	-	-	7	5	6
Splash Pink	HIM	-	11	-	2.0	-	-	-	8	9	9	-	-	-
Splash Rose	HM	-	17	-	2.0	-	-	-	10	9	10	-	-	-
Splash Salmon	HM	6	-	7	1.9	8	6	6	-	-	-	5	5	4
Sun and Shade Star Mix	GR	-	14	-	1.3	-	-	-	9	9	7	-	-	-
Super Elfin Coral	PA	-	10	3	1.7	-	-	-	9	9	8	6	5	8
Super Elfin Orange	PA	-	-	11	2.0	-	-	-	-	-	-	7	7	7
Super Elfin Pastel Mix	PM	-	13	-	1.3	-	-	-	9	8	8	-	-	-
Super Elfin Sal-Blush	PA	-	14	4	1.5	-	-	-	9	8	8	6	6	2
Super Elfin Salmon	PA	-	-	9	2.0	-	-	-	-	-	-	7	8	5
Tango	AAS	19	-	11	2.1	6	6	3	-	-	-	7	6	7
Tempo Orange	BS	6	15	8	2.0	6	7	6	9	10	9	7	7	7
Tempo Salmon	BS	6	14	9	2.0	8	7	5	9	9	9	6	7	7

¹See Source List for seed source key. ²Mature height including flowers; site average. ³Width of single blossom; value given is average across sites. ⁴Rating 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." Most

breeding of these plants is now done in the U.S., and many products of those efforts have been All America selections.

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 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. Its high incidence at all three Minnesota test locations in 1991 made ratings difficult. Nevertheless, a few cultivars still were outstanding. These included 'Voyager Gold' and 'Perfection Yellow' at Morris, 'Marvel Gold Delite' at Grand Rapids, and 'Safari Tangerine,' 'Laguna Gold' and 'Zenith Rouge' in St. Paul.

Together, the dwarf French and tall African marigold types accounted for slightly more than 7% of the total U.S. bedding plant crop in 1991. Among growers/marketers, 82% rated them to be good or excellent items.

Table 6. Marigold cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/8	8/22	9/1
Aurora Fire	GO	12	-	-	2.0	10	7	2	-	-	-	-	-	-
Aurora Gold	GO	12	-	-	2.0	8	7	2	-	-	-	-	-	-
Aurora Light Yellow	GO	11	-	-	2.0	7	6	3	-	-	-	-	-	-
Aurora Mixture	GO	11	12	-	1.7	7	6	2	10	6	5	-	-	-
Aurora Yellow Fire	GO	8	-	-	2.0	6	4	2	-	-	-	-	-	-
Bonanza Bee	DN	9	-	-	2.0	6	6	4	-	-	-	-	-	-
Bonanza Deep Orange	DN	8	14	-	1.4	5	3	2	10	7	6	-	-	-
Bonanza Yellow	DN	-	12	-	1.3	-	-	-	9	7	4	-	-	-
Boy, Orange	DN	-	11	-	1.2	-	-	-	10	9	7	-	-	-
Boy, Yellow	DN	-	10	-	1.3	-	-	-	10	8	8	-	-	-
Calico	DN	-	15	-	2.0	-	-	-	10	5	6	-	-	-
Calico, Yellow	DN	-	15	-	2.1	-	-	-	9	5	5	-	-	-
Champion Gold	RS	-	12	-	2.0	-	-	-	9	8	6	-	-	-
Champion Yellow	RS	-	14	-	2.0	-	-	-	10	8	6	-	-	-
Classic Harmony	GR	-	14	-	1.3	-	-	-	9	8	5	-	-	-
Cortez Yellow	HM	-	19	-	3.2	-	-	-	7	7	4	-	-	-
Crackerjack Mix	NK	-	33	-	3.2	-	-	-	8	6	4	-	-	-
Disco Flame	BS	8	-	-	1.7	5	6	2	-	-	-	-	-	-
Discovery Mix	BS	11	-	-	3.2	5	5	3	-	-	-	-	-	-
Espana	DN	-	10	-	1.3	-	-	-	10	9	6	-	-	-
Excel Gold	GO	18	20	18	3.4	6	8	2	9	8	3	7	10	6
Excel Primrose	GO	18	20	15	3.4	6	6	2	10	8	2	5	8	6
Excel Yellow	GO	19	19	16	3.3	6	6	2	9	7	4	7	6	5
Fireworks, Golden	BU	6	-	-	2.2	6	4	2	-	-	-	-	-	-
Fireworks, Orange	BU	12	-	-	2.2	8	6	2	-	-	-	-	-	-
Golden Gate	MAS	12	14	13	2.7	7	7	3	10	7	5	8	9	5
Hero Flame	BS	11	-	-	2.0	6	5	3	-	-	-	-	-	-
Hero Yellow	BS	13	-	-	2.0	7	6	2	-	-	-	-	-	-
Inca Gold	GO	21	21	-	4.2	6	6	3	7	7	5	-	-	-
Inca Orange	GO	22	23	-	3.3	7	8	3	8	7	5	-	-	-
Inca Yellow	GO	23	21	-	3.7	6	8	4	8	6	4	-	-	-
Janie	GO	9	-	19	1.8	6	6	2	-	-	-	7	8	3
Janie Bright Yellow	GO	7	-	10	1.7	6	6	3	-	-	-	7	8	2
Janie Flame	GO	8	-	11	2.0	7	6	2	-	-	-	8	8	5
Janie Harmony	GO	10	-	10	1.9	8	6	3	-	-	-	7	9	2

Table 6 (continued). Marigold cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/5	8/9	8/22	9/1
Janie Mixture	GO	10	-	-	1.5	6	7	3	-	-	-	-	-	-
Janie Primrose	GO	8	11	9	1.5	6	7	3	9	8	6	7	8	3
Janie Tangerine	GO	8	-	9	1.8	4	6	2	-	-	-	6	7	4
Laguna Gold	HM	9	11	-	2.3	6	6	3	10	8	7	-	-	-
Laguna Yellow	HM	10	12	-	2.0	7	6	2	10	8	6	-	-	-
Legend Mix	HM	-	13	-	2.0	-	-	-	10	7	8	-	-	-
Leka	CL	14	16	13	2.1	7	7	2	9	9	6	8	9	4
Little Hero Flame	BS	7	-	7	1.9	3	3	2	-	-	-	6	7	2
Little Hero Orange	BS	7	10	9	2.2	6	4	3	9	6	5	6	8	3
Little Hero Yellow	BS	12	12	11	1.7	9	8	3	9	7	6	7	8	6
Marvel Gold	BU	-	23	-	3.0	-	-	-	7	8	3	-	-	-
Marvel Gold Delite	BU	-	-	17	3.3	-	-	-	-	-	-	6	9	8
Marvel Yellow Chiffon	BU	-	22	19	3.1	-	-	-	6	7	4	6	8	7
Mighty Marietta Orange	HM	8	12	16	1.6	6	8	2	10	8	8	7	8	4
Nugget Supreme Gold	BU	11	-	12	2.1	8	7	2	-	-	-	8	9	2
Nugget Supreme Orange	BU	10	-	11	1.9	9	6	2	-	-	-	7	9	4
Nugget Supreme Yellow	BU	10	-	11	1.9	7	6	2	-	-	-	8	8	2
Perfection Gold	GO	21	27	-	3.4	7	7	2	7	7	4	-	-	-
Perfection Orange	GO	21	21	-	3.1	8	10	6	7	8	6	-	-	-
Perfection Yellow	GO	22	26	-	3.2	9	10	2	7	8	5	-	-	-
Fled Seven Star	BU	11	-	-	2.0	8	7	2	-	-	-	-	-	-
Floca	CL	17	18	13	2.3	9	5	2	10	7	6	8	9	5
Rosa	CL	14	18	13	2.0	7	7	2	8	8	5	7	9	3
Safari Gold	BS	8	12	10	1.8	5	3	2	9	4	7	5	7	6
Safari Queen	BS	8	13	11	2.2	6	6	2	10	6	7	7	8	4
Safari Tangerine	BS	11	-	-	2.0	6	7	2	-	-	-	9	9	4
Safari Tangerine	BS	13	15	14	2.3	9	6	2	10	6	5	-	-	-
Safari Yellow	BS	12	-	-	2.2	5	8	3	-	-	-	-	-	-
Sophia, Orange	PA	12	-	-	1.7	6	7	3	-	-	-	-	-	-
Sophia, Scarlet	PA	13	-	-	2.0	6	6	2	-	-	-	-	-	-
Sophia, Yellow	PA	11	-	-	2.0	4	6	3	-	-	-	-	-	-
Voyager Orange	BS	16	-	-	3.2	10	9	2	-	-	-	-	-	-
Voyager Yellow	BS	16	-	-	3.5	6	8	3	-	-	-	-	-	-
Zenith Golden Yellow	-	-	16	-	1.3	-	-	-	10	7	6	-	-	-
Zenith Orange	CL	12	15	11	2.2	7	5	2	10	7	4	7	7	2
Zenith Red & Gold Bicolor	CL	-	-	13	3.0	-	-	-	-	-	-	8	9	4
Zenith Rouge	CL	11	19	-	2.3	6	5	2	10	6	6	-	-	-
Zenith Yellow	CL	15	20	14	2.3	6	3	2	10	7	5	8	9	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*) are botanically considered 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.

Pansies can be found with flowers in nearly every color imaginable, as single colors, mixes and blends, with smooth flowers or ruffles. Large flowers, vigorous plants and increased ability to bloom in hot weather are characteristic of modern cultivars. They do, however, prefer cooler temperatures, and tolerate partial shade.

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 a medium maintenance crop 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.

In Grand Rapids, pansies were still colorful as late as October 24, and the

varieties 'Springtime Orange' and 'Favorite Deep Blue' were considered outstanding performers. Quality decreased much more rapidly in St. Paul and Morris.

The pansy market, including that for small flowered viola cultivars, has been growing in recent years, and in 1991 pansies accounted for about 3% of the total U.S. bedding plant crop. Bedding plant growers/marketers generally (80%) rated them as an excellent or good item.

Table 7. Pansy cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Accord Blue Blotch	GO	9	-	11	2.0	10	9	0	2	6	0	8	8	7
Accord Clear Blue	GO	8	8	10	1.9	10	9	0	6	6	4	7	8	8
Accord Clear White	GO	7	7	-	1.4	6	5	0	4	4	0	-	-	-
Accord Clear Yellow	GO	8	6	-	1.4	5	4	0	3	4	0	-	-	-
Accord Red Blotch	GO	7	7	-	1.7	8	6	0	3	4	0	-	-	-
Accord White Blotch	GO	7	7	-	1.6	7	6	0	4	5	0	-	-	-
Accord Yellow Blotch	GO	7	-	-	1.7	7	6	0	-	-	-	-	-	-
Armado Blue w/Eye	RS	7	7	12	1.9	7	8	0	5	5	4	8	9	7
Armado Orange	RS	7	-	9	1.9	4	4	0	-	-	-	8	8	6
Armado Pure White	RS	-	5	-	1.3	-	-	-	3	4	2	-	-	-



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 pack in about four months. This was a 1996 All America Selection.

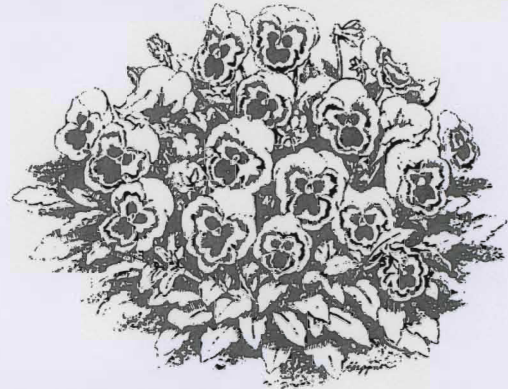
Armado Pure Yellow	RS	-	7	-	1.3	-	-	-	5	4	3	-	-	-
Armado Red Wing	RS	-	6	-	1.3	-	-	-	6	5	2	-	-	-
Armado Rose Pink	RS	-	5	-	2.0	-	-	-	2	4	0	-	-	-
Armado White Blotch	RS	-	6	-	1.2	-	-	-	2	4	0	-	-	-
Armado White w/Eye	RS	-	7	-	1.2	-	-	-	6	4	2	-	-	-

Table 7(continued). Pansy cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Armado Yellow w/Eye	RS	-	6	-	1.3	-	-	-	5	6	4	-	-	-
Corso Blue w/Eye	RS,SG	8	7	9	1.9	10	9	0	5	6	4	8	9	7
Corso Orange	RS,SG	8	7	9	1.6	6	6	0	5	5	2	8	8	6
Corso Pure White	RS	-	7	-	1.2	-	-	-	6	6	4	-	-	-
Corso Red Wing	RS	-	6	-	1.2	-	-	-	5	4	2	-	-	-
Corso Violet Blue	RS	-	7	-	1.1	-	-	-	6	6	0	-	-	-
Corso White w/Eye	RS	-	6	-	1.2	-	-	-	6	4	2	-	-	-
Corso Yellow w/Eye	RS	-	5	-	1.1	-	-	-	4	3	0	-	-	-
Crystal Bowl Orange	PA	6	-	8	1.9	6	6	0	-	-	-	7	8	7
Delft	HM	-	7	-	1.3	-	-	-	5	5	2	-	-	-

Pansy 'Maxim Marina'

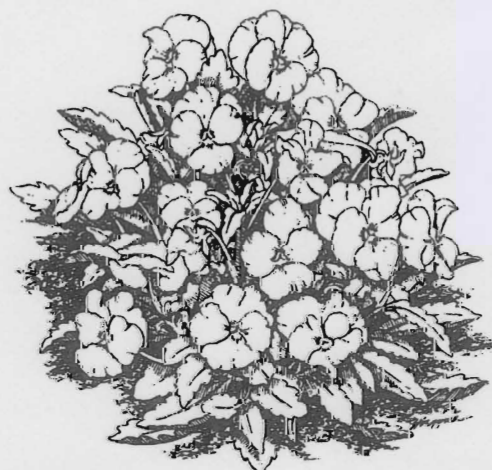
A tough and enduring pansy with delicate blue and white flowers. With enough moisture, even sun, heat and drought will not stop its flowering. It grows easily in beds and containers. This was a 1991 All America Selection.



Favorite	-	-	8	-	1.2	-	-	-	5	6	3	-	-	-
Favorite Blue	CL	8	10	-	1.5	10	9	0	6	8	6	-	-	-
Favorite Deep Blue	CL	-	-	11	2.3	-	-	-	-	-	-	10	10	10
Imperial Blue Hybrid	BU	8	8	11	2.1	10	9	0	6	5	2	9	9	10
Imperial Orange Prince	PA	6	-	13	2.1	7	6	0	-	-	-	7	9	9
Joker Light Blue	PA	7	10	11	2.0	10	9	0	8	8	4	8	8	8
Jolly Joker	AAS	8	6	8	1.6	6	6	0	5	6	4	7	7	5
Maxim Marina	AAS	8	9	12	1.8	10	9	0	8	7	5	9	9	8
Medallion Blue/Blotch	HM	7	8	11	2.4	10	9	0	4	5	3	8	8	8
Medallion Mix	HM	-	10	-	2.0	-	-	-	6	5	4	-	-	-
Medallion Rose Blotch	HM	-	7	-	1.3	-	-	-	4	3	2	-	-	-
Padparadja	AAS	7	6	10	1.7	10	9	0	3	4	3	8	9	7
Presto Apricot	BS	8	10	10	1.7	5	4	0	7	6	4	7	8	6
Princess Blue	BU	-	8	9	1.0	-	-	-	7	8	6	10	9	8
Princess Cream	BU	-	7	-	0.2	-	-	-	5	5	2	-	-	-
Princess Mixed	BU	-	8	-	0.3	-	-	-	9	6	4	-	-	-
Princess Purple w/Face	BU	-	7	8	1.0	-	-	-	8	6	4	9	9	7
Princess Yellow	BU	-	7	-	0.3	-	-	-	6	5	4	-	-	-
Regal Blue w/Blotch	SK	-	-	12	2.3	-	-	-	-	-	-	8	9	7
Reves Varied	CL	-	11	-	1.2	-	-	-	7	6	4	-	-	-
Roc Blue	SG	8	9	11	2.0	10	8	0	4	5	2	8	8	6
Roc Carmine Rose	SG	-	-	-	0.0	-	-	-	3	0	0	-	-	-
Roc Golden	SG	6	5	-	1.4	5	4	0	5	3	2	-	-	-
Roc Light Blue	SG	-	7	-	1.3	-	-	-	7	8	0	-	-	-
Roc Mix	SG	-	7	-	1.2	-	-	-	4	4	2	-	-	-

Table 7(continued). Pansy cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Roc Orange	SG	8	7	9	1.8	7	6	0	5	3	2	8	9	6
Roc Red	SG	-	6	-	1.3	-	-	-	4	4	2	-	-	-
Roc Red Yellow	SG	-	6	-	2.0	-	-	-	4	5	2	-	-	-
Roc White	SG	-	9	-	1.2	-	-	-	8	6	3	-	-	-
Spanish Sun	PA	8	-	-	1.7	4	4	0	-	-	-	-	-	-
Springtime Azure Blue	HM	-	6	-	2.0	-	-	-	6	6	4	-	-	-
Springtime Black	HM	8	8	10	1.8	5	4	0	6	6	4	8	8	7
Springtime Clear Blue	HM	-	7	-	2.0	-	-	-	7	6	2	-	-	-
Springtime Deep Blue/Blotch	HM	8	8	11	1.8	10	9	0	9	6	5	9	9	9
Springtime Lemon Splash	HM	8	6	-	1.5	4	4	0	4	6	2	-	-	-
Springtime Orange	HM	7	9	12	1.8	6	5	0	4	5	4	8	9	8
Springtime Porcelain Blue	HM	8	7	12	2.3	10	9	0	7	6	6	9	9	10
Springtime Primrose Yellow	HM	-	7	-	1.3	-	-	-	6	6	2	-	-	-
Springtime Pure Blue	HM	-	6	-	1.3	-	-	-	6	3	2	-	-	-
Springtime Red	HM	-	9	-	1.2	-	-	-	4	4	2	-	-	-
Springtime Red Yellow	HM	-	9	-	1.2	-	-	-	7	5	4	-	-	-
Springtime Rose Blotch	HM	-	10	-	2.0	-	-	-	6	6	4	-	-	-
Springtime Yellow	HM	-	6	-	1.3	-	-	-	6	5	5	-	-	-
Springtime Yellow Blotch	HM	-	11	-	2.1	-	-	-	6	8	6	-	-	-
Springtime Yellow Marble	HM	-	8	-	1.3	-	-	-	8	6	6	-	-	-
Universal Blue Blotch	GO,SK	7	10	9	1.8	10	9	0	6	6	6	7	8	7
Universal Mix	-	-	11	-	1.3	-	-	-	7	6	2	-	-	-
Universal Orange	GO,SK	6	9	9	1.6	8	6	0	5	4	4	7	8	6
Universal Red Bicolor	GO	8	10	-	1.5	6	6	0	6	7	4	-	-	-
Universal Yellow Blotch	SK	7	7	-	1.3	7	6	0	6	6	2	-	-	-
Visa Mix	CL	-	6	-	1.2	-	-	-	6	3	2	-	-	-
Watercolor Mix	HM	-	10	-	2.0	-	-	-	7	6	4	-	-	-



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.

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

The ancestors of modern petunias are thought to have originated in South America. Major breeding efforts among open pollinated cultivars were pioneered by a French botanist in the mid-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.

Large flowered grandifloras have been the most popular type, although they have fewer flowers than the slightly more compact multifloras. Recently, however, multiflora petunias have been gaining popularity due to more uniform free-flowering habit. All cultivars bloom throughout the summer. Flowers 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.

Petunias can be propagated by seeds or cuttings, though seeds are usually used. Seeds are very small (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 to germinate. Germination takes about one week.

Plant heights range between 10 and 15 inches. Many outstanding cultivars were grown at Minnesota's three test sites in 1991: 'Blue Pearls,' 'Primetime Blue,' 'Primetime Pink,' 'Light Pink Pearls' and 'Arctic Pearls' (Morris); 'Celebrity Pink Morn,' 'Super Magic Pink,' 'Deep Rose Pearls' and 'Rose & White Pearls' (St. Paul); 'Polo Salmon,' 'Polo Burgundy Star,' 'Primetime Red Star,' 'Arctic Pearls' and 'Azure Pearls' (Grand Rapids).

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.

Insects are not usually a problem in production, but diseases can be, specifically damping-off caused by *Rhizoctonia*, *Pythium* or *Phytophthora*. Aster yellows was a problem in the field in 1991. The multiflora types generally provided more colorful displays and held up better under wet weather than did grandifloras.

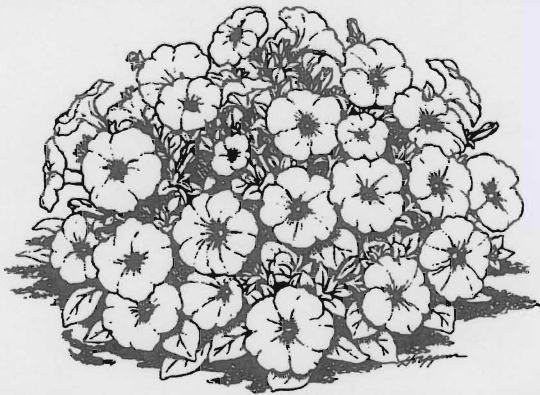
As a group, petunias (multiflora, grandiflora and doubles) are the second most popular annuals, trailing only impatiens. Petunias accounted for about 12% of the 1991 U.S. market for bedding plants. Bedding plant growers/marketers strongly (87%) rated them as an excellent or good group of items, though doubles were more heavily seen as only fair (44% good or excellent and 32% fair) by a much larger portion of those growers.

Table 8. Petunia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Carpet, Mix	PM	-	15	-	2.2	-	-	-	8	10	9	-	-	-
Carpet, Salmon	PM	-	16	-	2.1	-	-	-	7	10	8	-	-	-
Carpet, Velvet	PM	-	14	-	2.2	-	-	-	6	10	10	-	-	-
Celebrity Lilac	BS	12	-	-	2.5	6	7	4	-	-	-	-	-	-
Celebrity Pink Morn	BS	13	22	18	2.6	8	9	6	9	10	10	10	10	9
Celebrity Red	BS	10	17	15	2.8	6	5	2	8	10	10	8	8	7
CL 100 Carmine	CL	-	18	-	2.2	-	-	-	9	10	8	-	-	-
CL 100 Ecarlate	CL	-	17	-	2.1	-	-	-	8	10	8	-	-	-
CL 100 Rose Vie	CL	-	15	-	2.1	-	-	-	8	10	8	-	-	-
CL 100 Ruby	CL	-	20	-	2.2	-	-	-	9	10	10	-	-	-
CL 100 Salmon	CL	-	17	-	2.2	-	-	-	9	10	8	-	-	-
CL 100 Salmon Tenore	CL	-	15	-	2.3	-	-	-	8	9	9	-	-	-
CL 84 Ecarlate	CL	-	13	-	3.0	-	-	-	7	9	8	-	-	-
CL 84 Ecarlate Salmon	CL	-	13	-	3.0	-	-	-	9	9	9	-	-	-
CL 84 Rose Flare	CL	-	15	-	2.2	-	-	-	10	10	10	-	-	-
CL 84 Rose Fance	CL	-	17	-	2.3	-	-	-	9	9	9	-	-	-
CL 84 Ruby	CL	-	14	-	2.3	-	-	-	9	9	9	-	-	-
CL 84 Salmon Tenore	CL	-	15	-	2.3	-	-	-	10	10	9	-	-	-
Cloud, Blue	GO	11	-	-	3.5	7	7	6	-	-	-	-	-	-
Cloud, Pink	GO	10	-	-	3.2	8	4	3	-	-	-	-	-	-

Table 8 (continued). Petunia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Cloud, Rose	GO	14	-	-	4.0	10	4	2	-	-	-	-	-	-
Cloud, Salmon	GO	16	-	-	3.7	7	5	2	-	-	-	-	-	-
Daddy, Mixed	PM	-	13	-	3.1	-	-	-	9	7	9	-	-	-
Daddy, Orchid	AAS	12	15	12	3.5	7	5	4	9	8	9	7	8	7
Daddy, Strawberry	PM	-	14	12	2.8	-	-	-	9	5	8	8	8	6
Daddy, Sugar	PM	-	19	-	3.0	-	-	-	9	9	9	-	-	-
Dreams, Midnight	PM	-	-	9	3.5	-	-	-	-	-	-	8	8	7
Dreams, Pink	PM	-	18	18	3.6	-	-	-	10	10	9	8	10	8
Dreams, Red	PM	-	-	13	3.5	-	-	-	-	-	-	9	8	7
Dreams, Salmon	PM	-	17	14	3.1	-	-	-	10	10	10	9	9	7
Dreams, White	PM	-	-	16	3.5	-	-	-	-	-	-	8	9	8
Electra Mix	SG	-	18	-	3.1	-	-	-	8	6	7	-	-	-
Electra Orchid	SG	9	-	-	3.2	6	4	2	-	-	-	-	-	-
Electra Pink	SG	10	-	-	3.5	8	4	2	-	-	-	-	-	-
Electra Salmon	SG	12	-	-	3.0	8	3	2	-	-	-	-	-	-
Flare, Rose	SG	17	-	-	2.5	10	6	3	-	-	-	-	-	-
Flash, Blue	SG	10	-	-	3.0	6	6	6	-	-	-	-	-	-
Flash, Coral	SG	11	-	-	3.2	7	5	2	-	-	-	-	-	-
Flash, Formula Mixed	SG	-	18	-	3.0	-	-	-	7	9	8	-	-	-
Flash, Pink	SG	12	-	-	3.2	8	4	2	-	-	-	-	-	-



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.

Flash, Red	SG	11	-	-	3.2	6	4	2	-	-	-	-	-	-
Flash, Rose	SG	15	-	-	3.2	10	5	4	-	-	-	-	-	-
Flash, Velvet	SG	12	-	-	3.2	5	5	2	-	-	-	-	-	-
Flash, White	SG	12	-	-	4.0	6	4	4	-	-	-	-	-	-
Freedom Blue Star	GR	-	14	-	2.0	-	-	-	4	8	8	-	-	-
Laser Blue	HM	12	-	15	3.4	8	8	7	-	-	-	9	9	7
Laser Lavender	HM	15	-	20	3.6	8	6	4	-	-	-	9	9	7
Laser Mix	HM	-	19	-	3.1	-	-	-	9	8	8	-	-	-
Laser Pink	HM	9	-	15	3.8	8	5	3	-	-	-	9	10	8
Laser Red	HM	9	-	11	3.6	6	2	3	-	-	-	8	8	6
Laser White	HM	12	-	12	3.7	9	4	4	-	-	-	8	9	6
Pearls, Arctic	HM	22	22	20	2.3	10	7	6	10	8	7	10	10	8
Pearls, Azure	HM	16	15	15	1.8	10	8	6	10	10	10	10	10	10
Pearls, Blue	HM	13	12	14	2.2	10	9	9	8	9	9	10	9	9
Pearls, Deep Rose	HM	14	16	16	2.3	10	6	4	10	10	10	9	9	7

Table 8 (continued). Petunia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Pearls, Light Pink	HM	15	18	16	2.9	10	6	4	9	9	7	9	10	8
Pearls, Light Salmon	HM	12	17	15	2.3	9	6	2	10	7	8	9	10	7
Pearls, Rose	HM	14	16	16	2.3	8	7	6	10	10	9	9	9	8
Pearls, Rose & White	HM	17	20	20	2.0	10	9	5	8	10	8	9	9	9
Pearls, Royal	HM	9	17	13	2.5	8	9	8	9	9	8	9	9	6
Pearls, Tahitian	HM	13	19	15	2.2	6	4	3	8	9	8	9	9	7
Polo Blue	SG	10	-	14	2.4	5	6	4	-	-	-	8	8	8
Polo Blue Star	SG	9	-	15	2.1	5	4	4	-	-	-	8	9	7
Polo Burgundy Star	AAS	13	18	14	2.1	8	6	4	8	9	8	9	9	7
Polo Pink	SG	14	20	13	2.3	10	7	5	10	8	10	9	10	10
Polo Pink Veined	SG	16	20	17	2.6	10	5	5	10	7	6	9	9	8
Polo Red	SG	8	14	14	2.6	6	4	2	6	9	10	8	8	7
Polo Red Target	SG	12	18	19	2.4	6	5	4	9	9	8	10	10	9
Polo Rose	SG	13	21	16	2.5	10	7	6	10	10	10	9	9	9
Polo Salmon	AAS	13	20	15	2.3	10	6	4	10	10	10	9	9	10
Polo Velvet	SG	18	20	19	2.7	8	6	4	8	10	10	9	9	8
Polo White	SG	18	-	16	3.1	8	4	4	-	-	-	8	9	7
Primetime Blue	GO	15	-	15	2.5	10	8	7	-	-	-	9	9	9
Primetime Blue Star	GO	10	-	15	2.5	8	3	3	-	-	-	8	9	8
Primetime Burgundy	GO	12	-	15	2.6	7	6	6	-	-	-	9	9	7
Primetime Burgundy Star	GO	12	-	15	3.1	6	6	3	-	-	-	9	9	6
Primetime Light Blue	GO	10	-	16	2.3	5	6	5	-	-	-	9	10	9
Primetime Lt. Pink Veined	GO	14	19	19	2.5	10	7	6	10	10	10	9	10	10
Primetime Pink	GO	13	-	16	2.6	10	6	5	-	-	-	10	10	10
Primetime Pink Veined	GO	12	-	13	2.9	8	6	4	-	-	-	9	10	9
Primetime Plum	GO	15	-	18	2.7	7	6	6	-	-	-	9	9	10
Primetime Red	GO	8	15	14	2.7	5	2	2	9	7	10	9	9	5
Primetime Red Star	GO	9	15	15	2.6	4	4	2	8	10	9	9	10	7
Primetime Rose	GO	13	13	14	2.3	9	7	6	10	10	10	9	9	10
Primetime Rose Star	GO	13	18	14	2.3	8	6	4	7	10	10	9	8	9
Primetime Salmon	GO	15	18	17	2.6	8	5	6	9	10	10	9	9	8
Primetime White	GO	12	-	17	2.4	6	6	4	-	-	-	9	10	10
Purple Rosette	AAS	11	14	11	3.4	5	7	2	8	8	8	7	8	6
Super Magic Pink	PM	-	13	-	3.0	-	-	-	10	10	10	-	-	-
Supercascade Blush Imp.	PM	-	15	-	3.0	-	-	-	9	5	8	-	-	-
Supercascade Mix	PM	-	19	-	3.1	-	-	-	7	6	6	-	-	-
Supercascade Pink	PM	-	15	-	3.1	-	-	-	10	8	8	-	-	-
Supercascade Rose	PM	-	15	-	3.0	-	-	-	9	8	8	-	-	-
Supercascade White	PM	-	15	-	3.0	-	-	-	9	8	6	-	-	-
Ultra Blue	GO	12	-	11	3.4	6	4	2	-	-	-	8	8	9
Ultra Blue Star	GO	13	-	16	2.9	6	4	2	-	-	-	9	9	7
Ultra Burgundy	GO	12	-	14	3.6	6	6	4	-	-	-	8	8	5
Ultra Crimson Star	AAS	11	14	12	3.3	6	6	4	8	8	8	7	8	5
Ultra Peppermint	GO	-	-	14	3.5	-	-	-	-	-	-	8	8	7
Ultra Pink	GO	10	-	15	3.5	8	5	3	-	-	-	8	9	6
Ultra Plum	GO	-	-	13	3.5	-	-	-	-	-	-	9	9	7
Ultra Red	GO	7	-	13	3.9	6	2	2	-	-	-	8	8	5

Table 8 (continued). *Petunia* cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Ultra Red Star	GO	-	-	15	3.5	-	-	-	-	-	-	9	8	8
Ultra Rose	GO	-	-	13	3.8	-	-	-	-	-	-	9	8	5
Ultra Rose Star	GO	-	-	13	4.0	-	-	-	-	-	-	8	8	7
Ultra Salmon	GO	-	-	13	3.3	-	-	-	-	-	-	9	9	7
Ultra White	GO	15	-	13	3.9	9	4	4	-	-	-	8	8	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.

PORTULACA

Portulaca is a small, creeping plant that will normally grow in the poorest of soils, provided it has excellent drainage and full sun. It is a succulent which grows to only about a 6 inch height. Its double flowered cultivars, looking like miniature roses, give rise to its common name, "moss rose."

Portulaca flowers are phototropic. They open fully only in bright sunlight and 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.

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

Wet weather at all three Minnesota test sites led to increased incidence of *Botrytis* rot of flowers and many foliar diseases. Portulaca

cultivars particularly suffered from root rot.

Portulaca held slightly more than 1% of the 1991 U.S. market for bedding plants. Most bedding plant growers/marketers (72%) considered it to be an excellent or good item.

Table 9. *Portulaca* cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Afternoon Delight	PA	4	-	-	2.0	8	0	0	-	-	-	-	-	-
Double Extra Mix	JU	7	-	-	2.2	7	0	0	-	-	-	-	-	-
Magic Carpet	BU	6	-	-	2.0	6	0	0	-	-	-	-	-	-
Sundance Mixtime	GO	4	8	4	1.7	6	0	0	8	9	1	6	8	3
Sundial Cream	BS	4	8	6	1.6	4	0	0	8	8	1	7	7	5
Sundial Fuschia	BS	5	8	4	1.7	8	0	0	5	7	1	7	11	5
Sundial Mix	BS	5	7	5	1.7	7	0	0	5	5	1	3	8	5
Sundial Orange	BS	4	7	5	1.9	8	0	0	8	7	1	8	7	6
Sundial Pink	BS	4	8	4	1.9	7	0	0	8	8	1	8	7	5
Sundial Scarlet	BS	4	10	6	1.0	6	0	0	5	9	1	7	5	3
Sundial White	BS	5	-	6	2.0	5	0	0	-	-	-	7	15	6
Sundial Yellow	BS	7	7	6	1.7	7	0	0	8	7	1	9	5	7
Sunny Boy Mixed	BU	7	-	-	2.2	6	0	0	-	-	-	-	-	-

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

SALVIA

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

Most *splendens* flowers are red, although new cultivars offer white, pink and purple shades. The *farinacea* type typically has white, blue or purple flowers. Flowers are borne in showy terminal clusters, and the flower stalks produce new buds continuously at their tips as they grow taller.

An entirely different type (*coccinea*) is the

new 'Lady in Red,' one of 1992's All America Selections. Among the three Minnesota test sites, it performed best in St. Paul.

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 salvia need full sun, and have some heat and drought tolerance. 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.

Wet weather in 1991 resulted in poor growth for most standard salvia at all three test sites. As the season progressed, floral display decreased and some aster yellows was noted. *Farinacea* types, however, did fairly well overall, and the cultivar 'Victoria' was an outstanding performer in St. Paul.

Salvia represented about 12% of the 1991 U.S. market for bedding plants. Bedding plant growers/marketers generally (77%) considered them to be an excellent or good item.

Table 10. Salvia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	type	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
			Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
			7/18	8/19	9/18	7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1	
Lady In Red	coccinea	AAS	24	30	33	8.7	4	3	4	7	8	8	8	8	6
Burgundy	splendens	HM	-	-	13	5.8	-	-	-	-	-	-	7	8	5
Chablis	splendens	HM	8	-	16	4.0	4	0	0	-	-	-	7	8	6
Firebird	splendens	HM	-	19	-	3.2	-	-	-	7	10	9	-	-	-
Firecracker Wow Mix	splendens	GR	-	16	20	6.4	-	-	-	6	5	8	9	9	9
Flare	splendens	PM	8	-	13	5.0	4	2	2	-	-	-	8	8	5
Fuego	splendens	SG	8	16	10	4.3	4	2	0	8	6	10	7	7	5
Grenadier	splendens	HM	8	18	18	4.5	5	2	6	6	10	10	7	7	6
Lambrusco	splendens	HM	8	17	10	4.5	4	2	6	7	6	8	8	8	5
Red Pillar	splendens	HM	-	23	-	7.0	-	-	-	6	10	10	-	-	-

Salvia 'Lady in Red'

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



Scarlet Queen	splendens	RS	-	18	-	7.0	-	-	-	9	7	8	-	-	-
Sizzler Burgundy	splendens	HM	-	-	13	5.5	-	-	-	-	-	-	7	8	5
Sizzler Lavender	splendens	HM	11	-	14	4.9	5	2	4	-	-	-	7	8	5
Sizzler Red	splendens	HM	6	16	11	3.7	4	2	4	7	6	8	7	6	5
Sizzler Salmon	splendens	HM	8	-	11	4.5	5	2	4	-	-	-	8	8	5

Table 10 (continued). *Salvia* cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	type	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
			Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
							7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
St. John's Fire	splendens	HM	11	20	11	5.7	6	2	3	9	7	8	7	7	4
Argent	farinacea	CL	-	29	25	6.50	-	-	-	8	10	9	8	9	9
Renaissance	farinacea	SG	-	30	20	6.90	-	-	-	6	10	10	9	9	9
Rhea Deep Blue	farinacea	CL	-	24	17	4.90	-	-	-	6	9	8	8	8	7
Victoria	farinacea	CL	-	18	22	6.0	-	-	-	8	10	10	8	9	9

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.

SNAPDRAGON

More than 200 hybrid snapdragon (*Antirrhinum*) cultivars are currently available. They have strong lengthy stems 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, grow quite uniformly, and are largely resistant to disease. Some cultivars can stand up well to strong winds. Snapdragons require sun, like cool temperatures and can survive severe frosts.

In order for snapdragons to flower through the heat of the summer, 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 6 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 held about 2% of the 1991

U.S. market for bedding plants. Bedding plant growers/marketers (71%) generally considered it to be an excellent or good item.

The snapdragon 'Tahiti Formula Mixed' was an outstanding performer in 1991 at St. Paul. 'Princess White' was outstanding at Grand Rapids.

Table 11. Snapdragon cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Aries Rose	CL	-	21	-	6.0	-	-	-	8	8	5	-	-	-
Axiom Jaune D'Or	CL	-	16	-	7.0	-	-	-	8	7	5	-	-	-
Axiom Orange Clair	CL	-	27	-	5.0	-	-	-	7	8	7	-	-	-
Cyanus Jaune Orange	CL	-	24	-	7.0	-	-	-	6	7	5	-	-	-
Floral Carpet Mix	TW	8	-	-	3.5	10	6	4	-	-	-	-	-	-
Floral Shower Lav. Bicolor	SK	8	-	8	4.5	6	7	3	-	-	-	9	7	6
Kim Blanc	CL	-	8	-	4.0	-	-	-	7	6	5	-	-	-
Kim Jaune Soufre	CL	-	8	-	4.0	-	-	-	9	6	5	-	-	-
Kim Mix	CL	-	10	-	4.0	-	-	-	5	6	5	-	-	-
Kim Orange	CL	-	7	-	4.0	-	-	-	8	5	6	-	-	-

Table 11 (continued). Snapdragon cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Kim Rose	CL	-	11	-	3.0	-	-	-	9	5	5	-	-	-
Liberty Mixture	GO	10	24	16	5.3	9	6	5	7	6	4	8	6	6
Little Darling Mix	TW	10	-	-	4.5	8	7	7	-	-	-	-	-	-
Madame Butterfly Mix	TW	22	-	-	5.0	6	7	7	-	-	-	-	-	-
Paxia Cuivre	CL	-	27	-	6.0	-	-	-	7	5	6	-	-	-
Paxia Orange Clair	CL	-	22	-	8.0	-	-	-	8	6	5	-	-	-
Princess White w/Purple Eye	AAS	8	15	16	5.0	10	5	4	9	7	6	7	8	8
Rocket, Frosty Rose	PA	15	-	-	7.5	5	6	6	-	-	-	-	-	-
Rocket, Lemon	PA	16	-	-	8.5	6	8	7	-	-	-	-	-	-
Rocket, White	PA	29	-	-	6.5	5	6	5	-	-	-	-	-	-
Tahiti Appleblossom	SG	6	7	8	3.3	6	6	4	7	4	8	8	7	6
Tahiti Formula Mixed	SG	8	7	10	4.3	6	6	5	9	7	9	9	8	7

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. It is noted for its usually solid colored flowers which are 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 plant's stems spread laterally and can root at its joints. It makes a very good flowering ground cover.

Verbena colors are typically blue, pink, red, white or purple. An unusual apricot and salmon colored flower is found on the new 'Peaches & Cream' cultivar which is among

this year's All American Selections. 'Peaches & Cream' was also an outstanding performer at Grand Rapids.

Another outstanding performer at a Minnesota test location was 'Amour Pink' at Morris. In general, however, verbena fell victim to the wet weather of 1991, and quality was lower than usual overall at all three Minnesota 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.

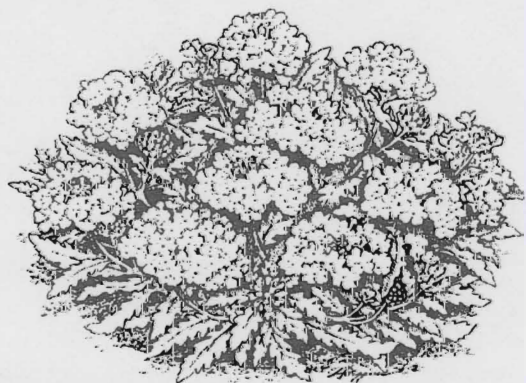
Verbena represented only about 1% of the 1991 U.S. market for bedding plants. A majority (63%) of bedding plant growers/marketers considered them to be an excellent or good item, and another 25% rated it as fair.

Table 12. Verbena cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Amour Light Pink	GO	9	-	7	1.8	6	8	3	-	-	-	8	9	6
Amour Pink	GO	8	-	8	1.8	9	10	5	-	-	-	7	7	6
Amour Purple	GO	-	-	8	2.5	-	-	-	-	-	-	7	8	6
Amour Red	GO	9	-	8	2.0	4	5	4	-	-	-	5	5	3
Amour Rose	GO	6	-	8	2.2	6	0	0	-	-	-	7	7	5

Table 12 (continued). Verbena cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	9/22	9/1
Amour White	GO	8	9	8	2.0	6	6	5	8	7	3	7	8	7
Lagoon Blue	CL	-	-	6	2.5	-	-	-	-	-	-	8	7	6
Novalis Deep Blue w/Eye	AAS	7	9	8	2.2	6	7	4	8	8	1	8	8	7
Novalis Mix	PA	7	9	-	1.9	5	8	3	7	6	1	-	-	-
Novalis Rose Pink	PA	8	-	9	1.9	7	5	4	-	-	-	8	9	6
Novalis Scarlet	PA	10	-	12	2.3	4	7	3	-	-	-	8	8	6
Peaches & Cream	AAS	9	9	14	2.3	10	10	6	7	5	3	9	10	9
Romance Carmine w/Eye	SG,HM	4	-	7	2.1	9	4	2	-	-	-	9	7	6
Romance Formula Mix	HM	7	9	-	1.8	10	5	4	10	4	9	-	-	-
Romance Scarlet	SG,HM	6	-	7	2.3	9	5	5	-	-	-	7	8	7
Romance Violet w/Eye	SG,HM	8	-	7	2.4	7	5	3	-	-	-	8	9	8
Romance White	SG,HM	5	-	6	1.9	8	2	2	-	-	-	5	6	5
Sandy Magenta	CL	-	-	9	1.9	-	-	-	-	-	-	5	5	2
Sandy Mix	CL	-	9	-	2.1	-	-	-	5	9	1	-	-	-
Sandy Rose	CL	-	-	8	2.3	-	-	-	-	-	-	6	6	3
Sandy Scarlet	CL	-	-	8	0.0	-	-	-	-	-	-	5	4	2
Sandy White	AAS	8	-	6	2.2	6	6	4	-	-	-	4	4	3
Showtime Mix	DN	5	13	-	1.5	4	3	4	8	6	3	-	-	-
Trinidad	PA	8	9	-	2.0	9	7	5	8	8	2	-	-	-
Trinidad Rose	CL	-	-	7	2.3	-	-	-	-	-	-	8	9	5



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 is a 1992 All America Selection.

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

VINCA

Currently one of the most talked about crops, vinca cultivars (*Catharanthus roseus*) have received several All American Selections awards in the past two years. Vinca flowers can be lavender, pink, rose or white, and some are bicolored with a contrasting eye. Its foliage is a bright, vibrant green.

Taller bush type cultivars can grow up to

18 inches tall. Dwarf cultivars grow to about 8 inches. Both types bloom all through the summer as they grow into bushy, compact plants. They are heat and drought tolerant.

Vinca seeds should be sown early in the winter because they germinate slowly. It can take many weeks for seedlings to reach a size large enough for transplant into the garden.

Vinca is a low maintenance plant that generally remains relatively free of insect or disease problems. However, they are not immune from such problems. The pressure of aster yellows disease was so intense at all of Minnesota's trial sites in 1991 that even some vinca cultivars were infected.

Vinca is a warm weather plant that needs

heat to flower, but grows well both in sun or partial shade. Temperatures in Minnesota in 1991 were generally not warm enough during the growing season to allow optimum performance. Despite that, 'Pretty in Rose' and 'Little Bright Eye' were outstanding

performers in Morris in 1991, while 'Peppermint Cooler' excelled in St. Paul.

Vinca commanded only about 2% of the 1991 U.S. market for bedding plants. However, a large majority (77%) of bedding plant

growers/marketers considered them to be an excellent or good item.

Table 13. Vinca cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	8/22	8/6	9/6	8/9	8/22	9/1
Carpet, Dawn	DN	5	9	7	1.7	6	4	4	7	8	6	7	8	7
Carpet, Pink	DN,PA	5	7	7	1.5	4	6	4	7	8	8	7	8	7
Carpet, Rose	DN	7	7	13	1.6	6	7	6	5	9	8	5	7	6
Carpet, Snow	DN	-	7	12	1.5	-	-	-	7	8	6	7	7	7
Cooler, Grape	BU	9	-	-	1.5	8	10	8	-	-	-	-	-	-
Cooler, Peppermint	DN	10	14	12	1.5	8	10	7	7	9	10	7	8	7
Little Blanche	DN,PA	10	16	14	1.5	7	8	9	7	9	10	7	8	8
Little Bright Eye	DN,PA	12	16	14	1.5	10	10	7	8	10	9	8	8	9
Little Delicata	DN	8	-	12	1.6	3	4	4	-	-	-	7	8	7
Little Linda	PA	10	-	14	1.6	8	8	7	-	-	-	7	7	8
Little Mix	DN	-	-	15	1.8	-	-	-	-	-	-	6	7	7
Little Pinkie	DN,PA	10	-	11	1.6	8	9	6	-	-	-	8	8	9
Little Rosie	DN	9	15	13	1.5	3	4	4	8	9	6	6	7	7
Magic Carpet Dawn	PA	6	8	-	1.5	7	5	5	5	5	4	-	-	-
Magic Carpet Mix	DN	-	-	10	1.8	-	-	-	-	-	-	8	8	7
Magic Carpet Pink	PA	6	7	-	1.3	2	2	2	7	8	8	-	-	-
Magic Carpet Rose	PA	5	8	-	1.4	7	9	7	6	7	4	-	-	-
Magic Carpet Snow	PA	6	9	-	1.9	8	5	7	7	7	8	-	-	-
Mixed Colors, Tall	BU	17	-	17	1.7	10	8	7	-	-	-	7	8	8
Parasol	AAS	13	16	14	2.0	9	9	8	7	10	10	8	8	9
Polka Dot	PA	5	7	9	1.6	8	6	5	7	8	8	7	8	7
Pretty in Pink	AAS	13	13	14	1.8	8	8	6	5	10	9	8	9	8
Pretty in Rose	AAS	11	16	13	1.5	8	9	9	7	10	10	7	8	8
Pretty in White	AAS	8	12	11	1.4	5	4	6	5	8	10	8	8	7
Sahara White w/Red Eye	BU	8	12	10	1.3	6	6	7	7	8	6	7	8	9

Vinca 'Pretty In White'

Following the footsteps of two 1991 winners, this new 1992 All America Selection thrives on heat. It offers continuous bloom on strong stems and tolerates bad weather, quickly recovering with a burst of new blooms. Seed requires darkness to germinate.



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.

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 several varieties of plants with large, plush blooms which come in just about any color but blue.

Three different species cover the most common garden cultivars (*Zinnia elegans*, *Zinnia haageana* and *Zinnia augustifolia*). With 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.

Zinnia 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.

Zinnia accounted for only about 1% of the 1991 U.S. market for bedding plants, and it was not considered to be a very good item by bedding plant growers/marketers, probably

because it is so easy for gardeners to grow from seed. Only 47% rated zinnia good or excellent. Another 34% rated it fair.

Foliar diseases dramatically decreased quality during late season rainings in Morris, though several cultivars turned in outstanding performances there despite that problem. These were 'Border Beauty Scarlet,' 'Border Beauty Yellow,' 'Yellow Ruffles' and 'Cherry Ruffles'.

Table 14. Zinnia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Border Beauty Rose	BU	23	-	-	3.0	9	8	2	-	-	-	-	-	-
Border Beauty Scarlet	BU	18	-	-	3.0	10	8	2	-	-	-	-	-	-
Border Beauty Yellow	BU	13	-	-	3.0	7	4	2	-	-	-	-	-	-
Cherry Giant	-	-	38	-	4.0	-	-	-	8	10	7	-	-	-
Enchantment Rose	-	-	35	-	4.0	-	-	-	8	10	6	-	-	-
Fantastic Light Pink	TW	16	-	-	3.5	6	6	2	-	-	-	-	-	-
Fire Cracker	BU	19	-	-	4.0	5	6	4	-	-	-	-	-	-
Lollipop Mixed	BU	-	10	8	2.3	-	-	-	9	6	2	7	7	8
Peter Pan Cream	TW	9	-	-	3.0	4	2	1	-	-	-	-	-	-
Peter Pan Flame	TW	12	-	-	3.0	6	5	2	-	-	-	-	-	-



Zinnia 'Scarlet Splendor'

Large red flowers on smaller plants allow this cultivar to create super impact in a small garden. This is also a good plant to grow in a container. 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.

Table 14 (continued). Zinnia cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Peter Pan Gold	TW	10	-	-	3.0	4	3	2	-	-	-	-	-	-
Peter Pan Mixture	GO	12	20	-	3.1	6	4	2	10	10	5	-	-	-
Red Sun	TW	18	-	-	3.5	5	7	2	-	-	-	-	-	-
Rosy Future	BU	25	-	-	4.0	8	9	4	-	-	-	-	-	-
Ruffles, Cherry	TW	24	-	-	2.5	10	10	4	-	-	-	-	-	-
Ruffles, Yellow	TW	22	-	-	2.5	10	10	4	-	-	-	-	-	-
Scarlet Splendor	AAS	20	-	-	4.0	5	9	2	-	-	-	-	-	-
Short Stuff Mix	GO	10	11	-	2.6	3	3	2	9	9	2	-	-	-
Small World Cherry	TW	17	-	-	2.2	9	9	2	-	-	-	-	-	-
Star White	-	-	18	-	1.0	-	-	-	5	9	6	-	-	-
Torch	BU	22	-	-	4.0	6	5	2	-	-	-	-	-	-
Yellow Marvel	TW	18	-	-	2.7	8	7	2	-	-	-	-	-	-
Yellow Zenith	BU	19	-	-	3.5	6	6	2	-	-	-	-	-	-

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.

OTHER MISCELLANEOUS BEDDING PLANTS

Aster yellows disease was especially bad at all Minnesota test sites in 1991, infecting many different bedding plants such as statice. Wet weather at all sites led to an increased incidence of *Botrytis* rot of flowers, and to many foliar diseases. Despite that

disease pressure, plants of several types could still be seen as outstanding performers at the various Minnesota test locations.

Among these outstanding performers were: *Cosmos* 'Ladybird Scarlet' (Morris);

Melampodium 'Medallion' and *Phlox* 'Palona Deep Rose' (St. Paul); and *Nicotiana* 'Nicki Rose' and 'Nicki Deep Rose' (Grand Rapids).

Table 15. Other miscellaneous bedding plant cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Common Name Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
<i>Achillea</i>^P														
Summer Pastels	AAS	-	24	15	4.6	-	-	-	3	8	5	6	6	7
<i>African Daisy</i>														
Giant Mix	-	-	14	-	1.3	-	-	-	5	5	1	-	-	-
<i>Ageratum</i>														
Atlantic Plus	RS	-	10	-	1.1	-	-	-	0	10	7	-	-	-
Blue Danube	BS	8	-	-	1.5	8	8	6	-	-	-	-	-	-

Table 15 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Common Name Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	8/22	8/6	9/6	8/9	8/22	9/1
Blue Hawaii	BS	7	--	--	1.2	6	5	5	--	--	--	--	--	--
Blue Lagoon	--	--	8	--	1.2	--	--	--	8	10	8	--	--	--
Pacific	RS	--	6	--	1.1	--	--	--	9	9	8	--	--	--
Poetry Think Pink	GR	--	10	--	1.0	--	--	--	6	6	3	--	--	--
<i>Alyssum</i>														
Carpet of Snow	NK	--	8	--	0.3	--	--	--	6	10	8	--	--	--
Easter Bonnet	DN	--	7	7	1.0	--	--	--	10	10	10	9	9	9
Golf Pastel Mix	CL	--	--	7	1.0	--	--	--	--	--	--	8	10	9
Minimum	RS	--	--	7	0.8	--	--	--	--	--	--	10	10	9
Snow Crystals	RS	--	9	10	1.0	--	--	--	10	10	10	10	10	10
<i>Aster</i>														
Flamir Mix	CL	--	25	--	3.1	--	--	--	3	6	0	--	--	--
Milady Mix	CL	--	12	--	2.3	--	--	--	3	6	0	--	--	--
Nova Mix	CL	--	17	--	3.3	--	--	--	3	2	0	--	--	--
<i>Basil</i>														
Purple Ruffles	AAS	--	18	13	N/A	--	--	--	8	10	10	8	9	8

***Achillea 'Summer Pastels'***

An improved dwarf yarrow with a wide range of soft pastel flower colors. This plant is easy to grow almost everywhere. Although a perennial, it can be grown as a green bedding plant in 12 weeks from seed. This was a 1990 All America Selection.

<i>Bellis</i>														
Radar Red	CL	--	--	--	0.0	--	--	--	--	--	--	3	2	2
Radar Rose	CL	--	--	2	0.0	--	--	--	--	--	--	3	2	2
Radar White	CL	--	--	1	0.0	--	--	--	--	--	--	3	2	2
<i>Calandrinia</i>														
Bogota	SG	--	--	--	0.0	--	--	--	1	0	0	0	0	0
<i>Canna</i>														
Tropical Horse	AAS	26	34	23	5.3	6	5	0	5	7	7	6	5	5
<i>Coreopsis</i>														
Early Sunrise	AAS	10	13	12	1.8	6	4	0	5	6	5	7	8	7
Sunburst	--	--	16	--	1.3	--	--	--	4	6	6	--	--	--
<i>Cosmos</i>														
Early Wonder	PA	34	--	--	4.0	3	3	0	--	--	--	--	--	--
Imperial Pink	PA	35	40	--	3.3	4	3	2	7	3	0	--	--	--
Ladybird Orange	PA	12	--	--	2.0	3	3	2	--	--	--	--	--	--
Ladybird Scarlet	PA	17	--	--	2.0	10	6	2	--	--	--	--	--	--
Ladybird Yellow	PA	13	--	--	2.0	3	2	3	--	--	--	--	--	--
Sonata White	RS	29	--	--	2.2	5	3	2	6	--	--	--	--	--
Sunny Red	BU	30	--	--	2.0	10	8	2	--	--	--	--	--	--

Table 15 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Common Name Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Dahlia														
Figaro Improved	RS	-	15	-	2.1	-	-	-	4	5	5	-	-	-
Harlequin	RS	-	19	-	3.0	-	-	-	6	3	3	-	-	-
Dill														
Fernleaf	AAS	20	-	-	4.0	6	2	0	-	-	-	-	-	-
Dusty Miller														
Silver Dust	BS	10	-	10	N/A	9	0	0	-	-	-	9	8	10
Gallardia														
Gaiety Mixed Colors	BU	19	34	16	2.5	4	4	3	6	6	5	5	5	6
Red Plume	AAS	13	23	-	2.3	6	4	3	4	7	5	0	0	0
Yellow Sun	PA	14	-	-	2.0	5	4	3	-	-	-	-	-	-
Gazania														
Daybreak Bronze	DN	7	-	-	4.0	6	6	3	-	-	-	-	-	-
Daybreak Garden Sun	CL	9	11	-	3.3	6	5	3	6	6	4	-	-	-
Gerbera														
Tempo Rose Shades	SK	6	-	7	3.8	6	0	0	-	-	-	6	6	4

Canna 'Tropical Rose'

This canna produces large flowers of soft rose above wide, lush foliage in about 100 days from sowing. Its large seeds germinate easily under warm conditions. As with all cannas, this cultivar performs best in warm weather under full sun. The tubers can be saved for the next year if brought in before the frost. This is a 1992 All America Selection.

**Gloriosa Daisy**

-	BU	26	20	-	4.0	7	8	0	8	5	9	-	-	-
---	----	----	----	---	-----	---	---	---	---	---	---	---	---	---

Godetia

Grace Salmon	SK	-	-	3	1.8	-	-	-	-	-	-	5	5	3
--------------	----	---	---	---	-----	---	---	---	---	---	---	---	---	---

Lisianthus

Echo Blue Picotee	SK	-	-	17	3.8	-	-	-	-	-	-	5	7	7
Echo Lilac Picotee	SK	-	-	13	4.3	-	-	-	-	-	-	6	7	7
Echo Pink Picotee	SK	-	-	16	4.0	-	-	-	-	-	-	7	7	6
Heidi Deep Blue	SK	-	-	13	3.0	-	-	-	-	-	-	6	8	7
Heidi Lilac Picotee	SK	-	-	15	3.3	-	-	-	-	-	-	7	8	8
Heidi Orchid	SK	-	-	9	3.0	-	-	-	-	-	-	3	2	4
Heidi Sky Blue	SK	-	-	16	3.5	-	-	-	-	-	-	7	8	7

Table 15 (continued). Other miscellaneous bedding plant cultivars evaluated in the 1991 bedding plant trials at Morris, St. Paul, and Grand Rapids.

Common Name Cultivar	Source ¹	Plant Height (inches) ²			Flower Width ³ (inches)	Overall Quality ⁴								
		Morris	St. Paul	Grand Rapids		Morris			St. Paul			Grand Rapids		
						7/18	8/19	9/18	6/22	8/6	9/6	8/9	8/22	9/1
Lobelia														
Blue Lace	CL	-	-	10	0.5	-	-	-	-	-	-	7	8	8
Collier Bleu	CL	6	5	-	0.4	4	3	2	9	8	3			
Compacta Blue Moon	SG	6	9	8	0.4	4	4	2	10	7	10	7	7	8
Compacta Paper Moon	SG	5	5	7	0.4	4	2	2	8	5	5	7	7	4
Rapid Blue	RS	-	7	10	0.3	-	-	-	10	5	4	6	5	4
Melampodium														
Medallion	SG	-	24	-	1.0	-	-	-	8	10	10	-	-	-
Nicotiana														
Nicki Bright Pink	PM	-	-	26	2.3	-	-	-	-	-	-	9	10	9
Nicki Deep Rose	PM	-	-	25	2.3	-	-	-	-	-	-	9	10	10
Nicki Lime	PM	-	-	29	2.0	-	-	-	-	-	-	10	10	9
Nicki Pink	PM	-	-	33	2.0	-	-	-	-	-	-	9	9	8
Nicki Rose	PM	-	-	25	2.0	-	-	-	-	-	-	10	10	10
Nicki White	PM	-	-	25	2.3	-	-	-	-	-	-	10	10	9
Starship Red	BA	-	12	18	1.6	-	-	-	8	3	2	9	9	10
Starship Rose Pink	BA	-	12	16	1.4	-	-	-	8	6	7	9	9	8
Phlox														
Palona Carmine	SG	-	10	7	0.7	-	-	-	5	8	3	7	8	6
Palona Crimson	SG	-	6	5	0.7	-	-	-	7	8	5	7	8	6
Palona Deep Rose	SG	-	9	-	1.0	-	-	-	6	7	2	-	-	-
Palona Deep Salmon	SG	-	8	8	0.7	-	-	-	4	8	4	7	8	6
Palona Light Salmon	SG	-	-	7	1.0	-	-	-	-	-	-	8	9	8
Palona Mix	SG	-	5	-	0.3	-	-	-	4	7	2	-	-	-
Palona Rose w/Eye	SG	-	7	-	0.2	-	-	-	3	7	2	-	-	-
Palona White	SG	-	8	8	0.5	-	-	-	4	7	2	8	9	6
Palona White w/Eye	SG	-	9	8	0.7	-	-	-	6	8	4	8	9	9
Sarvatalia														
Mandarin Orange	AAS	18	12	13	0.6	9	7	2	8	9	5	9	9	8
Shasta Daisy⁵														
Alaska	-	-	19	-	3.0	-	-	-	3	4	5	-	-	-
Snow Lady	AAS	-	9	10	2.4	-	-	-	5	4	4	6	7	7
White Knight	BU	-	-	9	3.0	-	-	-	-	-	-	6	6	5
Statice														
Turbo Blue	BS	24	-	23	2.8	4	4	2	-	-	-	5	5	5
Turbo Carmine	BS	27	-	22	3.4	8	4	2	-	-	-	6	6	5
Turbo Peach	BS	20	-	22	3.4	4	3	2	-	-	-	6	7	6
Turbo Purple	BS	15	25	23	2.2	6	4	2	4	6	6	7	7	7
Turbo White	BS	29	-	28	3.6	6	4	2	-	-	-	6	6	5
Turbo Yellow	BS	29	26	22	3.0	6	2	2	6	7	3	6	7	6
Tomato, Ornamental														
Micro-Tom	RS	-	-	4	0.8	-	-	-	-	-	-	7	8	6
Torenia														
Clown Mixture	AAS	-	6	6	1.1	-	-	-	5	5	1	6	6	4
Panda Dwarf Blue	SK	-	-	7	1.0	-	-	-	-	-	-	6	7	7
Panda Dwarf Pink	SK	-	-	7	0.8	-	-	-	-	-	-	4	7	4

¹See Source List for seed source key. ²Mature height including flowers; site average. ³Width of single blossom except for Achillea, Alyssum, Dill and Statice (width of head); Tomato (width of fruit); N/A indicates foliage plant; value given is average across sites. ⁴Rating on 1 to 10 scale for floral display and foliage quality. ⁵Herbaceous 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
BA	George J. Ball, 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, Muenden, Germany
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
JU	J.W. Jung Seed Company	Randolf, WI 53957
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
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	Twilley Seeds Company, Inc.	P.O. Box 65, Trevoise, PA 19047