

## **MISSISSIPPI STATE UNIVERSITY GERANIUM TRIALS 1999**

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Vegetatively propagated geraniums continue to be ranked as one of the top selling bedding plants in the United States. In the Mid-South region geraniums often suffer from heat the high heat and humidity typical of the summer climate for this region. Due to the majority of trial sites being located in more northern climates, producers in the South must rely on their own past experience and on supplier recommendations to determine the best performing cultivars. However, most growers only see the plants in their greenhouses during the cooler spring production months. Cultivars that perform well in the greenhouse may not perform well outside through the summer months. The objective of this study was to examine the performance of vegetatively produced zonal and ivy geraniums in American Horticulture Society Heat Zone 8.

### **Materials and Methods**

One hundred and fifteen cultivars of geraniums were grown in 1999 at Mississippi State University to examine the performance of the cultivars in the mid south region. Plants were obtained from Ball FloraPlant, Fischer USA, Goldsmith, and Oglevee.

As the rooted cuttings arrived from different vendors, they were potted into 6 inch diameter azalea pots in Sunshine Mix 1 (Sun Gro Horticulture, Bellevue, WA). Arrival of each company's cuttings occurred on the following dates: Ball FloraPlant, March 2; Fischer USA, March 4; Oglevee, March 17; Goldsmith, April 13. All cuttings were drenched with a fungicide (Subdue at 1 oz/100 gallons) after potting. Plants received a Subdue fungicide drench monthly until planting

outside. During greenhouse production all plants received a continuous liquid feed of 150 mg@iter<sup>-1</sup> N for the first 6 weeks and then at 200 mg@iter<sup>-1</sup> N from 15N-6.45P-12.45K Peters 15-15-15 Geranium Special (The Scotts Co., Marysville, OH) until the plants were planted outside. The plants all received a Florel treatment at 350 mg@iter<sup>-1</sup> two weeks after potting. Plants were then manually disbudded until 4 weeks before transplanting outside. On May 13, 1999, the plants were transplanted 3 plants to a 14 inch diameter container and placed outside in a full sun location on a gravel nursery production slab. Each cultivar was replicated 3 times. The containers were watered using drip irrigation for 20 minutes every other day throughout the summer. Each container of plants received 78g of Osmocote 15N-4.73P-10.79K (The Scotts Co., Marysville, OH) when first planted and again in late July. The plants were treated with chelated iron at 8 oz./100 gallons every 3 weeks. Plants were deadheaded every two to four weeks while grown outdoors.

Data were collected every two weeks from late May to mid October. Chlorosis was rated on a visual scale as follows: 1) almost entire plant chlorotic or bleached white, 2) about 75% of the plant chlorotic, 3) about 50% of the plant chlorotic, 4) about 25% of the plant chlorotic, 5) no visible chlorosis. Plant form and growth was also evaluated on a visual scale of 1 to 5 as follows: 1) plants almost dead with only a hint of growth, no flowers; 2) soil visible in the container around the plants, little canopy cover, reduced flowering; 3) good canopy cover but plants not larger than the diameter of the container, average flower cover; 4) plants larger than the diameter of the container and showing good general form, very floriferous; 5) plants growing vigorously, they were larger than the container, and the container was hidden by the plants, very floriferous.

## **Results and Discussion**

The plants were left to grow until killed by a freeze in late December. After our first frost in early November, the flowers that were open died but were soon replaced by those that were still developing. The plants showed good foliar color until late November. Flowering decreased as the temperatures decreased in the fall. The results for all cultivars have been tabulated into the following tables: cultivars scoring 4 or higher (table 1); foliar chlorosis ratings (table 2); plant quality by month (table 3); overall combined chlorosis and quality ratings by early, mid, and late summer and overall (table 4). There is strong evidence to link overall performance of geraniums in the mid-south to an adequate supply of iron in the soil and to adequate plant size and establishment before planting outside. The plants from Goldsmith arrived in mid April and were planted outside about one month later. These cultivars were still small and poorly established in their pots when planted outside and as a result did not grow well in the full sun and heat of the Mississippi summer.

Table 1: Cultivars scoring a 4 or higher overall rating for chlorosis and quality averaged over the entire summer. Cultivars were rated on a scale of 1 to 5 with 5 being the best.

Cultivar	Type	Overall rating	
Boogy	zonal	4.32	Fischer USA
Designer Lilac Chiffon	zonal	4.06	Ball FloraPlant
Designer Purple Rose	zonal	4.03	Ball FloraPlant
Fantasia Coral	zonal	4.73	Ball FloraPlant
Fantasia Salmon Mist	zonal	4.12	Ball FloraPlant
Galleria Sunrise	zonal	4.68	Ball FloraPlant
Grand Prix	zonal	4.21	Fischer USA
Lucille	zonal	4.58	Oglevee
Showcase Scarlet	zonal	4.86	Ball FloraPlant
Beach 99	ivy	4.70	Fischer USA
Colorcade Burgundy	ivy	4.38	Ball FloraPlant
Colorcade Pink	ivy	4.73	Ball FloraPlant
Global Merlot	ivy	4.14	Oglevee
Mexicana	ivy	4.32	Fischer USA
Ragtime 99	ivy	4.14	Fischer USA
Blue Blizzard	ivy	4.24	Fischer USA
White Blizzard	ivy	4.26	Fischer USA

Table 2: 1999 geranium cultivar evaluations. Average foliar chlorosis ratings by month and over the entire summer.

CULTIVAR	May	June	July	Aug.	Sept.	Oct.	Overall
<b>Ball FloraPlant</b>							
Designer Rose	4.33	3.50	3.33	1.67	1.67	2.50	3.24
Designer WhiteFire	3.67	2.67	2.17	1.67	1.33	3.50	3.27
Designer Dark Red	4.67	3.83	3.50	2.67	2.67	3.00	3.24
Designer Purple Rose	4.67	4.17	4.33	3.83	3.50	3.33	2.94
Designer Pink Parfait	4.67	3.33	3.67	2.50	1.67	2.17	3.85
Designer Lilac Chiffon	5.00	4.50	4.17	3.00	3.17	3.83	3.30
Designer Light Pink	4.00	3.33	3.50	2.33	2.00	2.50	2.85
Designer Red	5.00	3.50	3.50	2.50	2.50	3.00	3.91
Designer Hot Pink	5.00	3.83	3.67	2.83	2.33	2.67	3.18
Designer Salmon	5.00	3.50	3.50	3.83	2.67	3.17	2.70
Designer Bright Red	5.00	3.83	3.50	2.67	2.33	3.00	3.48
Designer Violet	3.67	3.67	3.67	2.17	2.17	2.75	3.79
Designer Salmon Rose	4.00	3.67	4.17	3.83	3.50	3.67	2.94
Designer White	4.33	3.67	3.67	3.17	2.33	3.33	3.33
Designer Picotee Salmon	4.67	3.83	3.83	2.67	2.00	3.50	2.28
Fantasia Flame	4.67	3.50	4.33	4.00	3.00	3.67	4.88
Fantasia Flamingo Rose	5.00	3.83	4.50	4.67	3.33	4.00	3.79
Fantasia Pink Shell	4.00	3.67	3.83	3.67	3.67	4.00	4.15
Fantasia Salmon Mist	5.00	4.67	4.33	4.33	3.50	3.67	3.80
Fantasia Coral	5.00	5.00	5.00	4.83	4.83	4.67	4.18
FloraStar Starburst Red	4.33	2.83	2.83	1.83	1.67	3.00	2.61
Showcase Pink Parfait	5.00	4.50	3.83	3.67	3.67	3.67	4.12
Showcase Red	5.00	4.67	4.33	3.33	3.17	3.17	3.39
Showcase Light Lavender II	2.67	3.83	4.00	3.00	2.50	4.00	3.85
Showcase Scarlet	5.00	5.00	5.00	5.00	5.00	4.67	3.97
Showcase Light Salmon	5.00	4.50	4.17	3.33	3.33	3.33	3.85
Showcase Bright Red	4.33	4.17	4.33	4.67	3.33	4.00	4.94
Colorcade Lilac	4.33	3.33	3.00	2.67	2.83	3.33	4.21
Colorcade Pink	5.00	4.67	3.83	4.50	4.83	4.67	4.06
Colorcade Burgundy	4.33	4.00	3.83	4.17	4.50	4.50	3.15
Colorcade Lavender	4.67	4.00	4.00	4.17	3.83	4.00	4.55
Galleria Ruby Red	3.67	3.33	3.17	2.33	2.33	2.50	2.82
Galleria SnowFire	3.33	4.00	3.83	3.00	2.83	3.83	3.48
Galleria Sunrise	4.67	4.50	4.00	4.17	4.67	5.00	4.48
<b>Fischer USA</b>							
Atlantis 96	4.00	4.00	3.83	3.00	2.33	2.83	3.27
Blues	4.00	3.67	3.50	3.00	2.33	3.50	3.27
Boogy	5.00	4.33	4.50	4.33	4.17	4.00	4.33

Brasil 99	4.67	3.50	2.67	2.00	1.50	2.67	2.67
Bravo Light Pink	5.00	4.17	4.33	3.17	2.33	3.17	3.76
Bravo	5.00	4.83	4.17	3.17	2.67	3.33	3.58
Calypso	4.33	4.00	3.67	2.50	2.17	3.70	3.29
Charmant	5.00	4.17	4.00	2.50	2.17	2.83	3.30
Diabolo 98	4.00	3.67	4.00	3.83	2.67	3.67	3.61
Dolce Vita	4.33	4.17	3.83	2.83	1.83	2.67	3.18
Gloria 98	4.33	3.67	3.83	3.67	3.17	3.33	3.61
Grand Prix	5.00	4.17	4.50	3.67	3.33	3.33	3.91
Jazz 99	5.00	4.33	3.67	2.83	3.00	3.33	3.58
Kardino	4.00	3.83	3.67	2.67	2.50	3.33	3.27
Lotus	5.00	5.00	4.67	3.00	3.00	3.00	4.27
Magic 99	4.33	3.83	3.67	3.17	2.33	3.50	3.39
Montevideo	5.00	4.67	4.17	3.67	2.83	3.33	3.85
Noblesse 99	4.67	4.50	4.17	3.17	3.33	3.75	3.86
Rocky Mt. White	4.67	3.83	3.83	2.67	2.17	3.33	3.30
Samba	5.00	4.17	3.67	3.33	2.83	3.50	3.64
Schoene Helena	5.00	3.83	3.50	3.33	3.17	3.33	3.58
Tango Light Salmon	5.00	3.83	3.17	2.67	2.67	3.50	3.58
Tango Orange	5.00	3.17	3.00	2.50	2.00	2.67	3.82
Tango Dark Red	5.00	4.33	4.00	3.33	3.33	3.50	3.33
Tango Violet	5.00	3.67	3.67	2.33	2.50	3.33	2.88
Tango	4.67	3.67	4.33	3.17	2.67	3.50	3.27
Tiffany 96	3.67	3.50	3.67	3.83	3.17	3.67	3.58
Amethyst	4.00	3.17	3.50	2.50	2.33	3.50	3.09
Barock 99	3.00	3.50	3.33	4.00	3.33	4.17	3.61
Beach 99	5.00	4.17	5.00	4.67	4.67	4.50	4.64
Belladonna 99	4.33	2.67	3.00	1.67	1.17	2.00	2.30
Blanche Roche	5.00	4.67	4.50	3.50	3.00	3.50	3.94
Bonito	4.33	4.00	4.50	4.00	4.50	4.50	4.30
Comedy	4.67	3.50	2.83	1.50	1.50	2.50	2.80
Lambada 98	3.67	3.50	3.17	1.50	1.67	3.17	2.70
Luna 98	4.67	3.67	3.33	2.67	2.33	3.00	3.15
Mandarin	4.33	3.17	3.83	3.33	2.50	3.33	3.33
Mexicana	4.67	4.00	4.50	4.33	4.67	4.00	4.33
Molina	4.67	2.67	3.83	3.33	3.50	3.83	3.55
Picasso	4.00	3.33	3.17	2.50	2.33	4.00	3.15
Ragtime 99	4.33	4.00	3.83	4.00	3.17	4.50	3.94
Taj Mahal	4.33	3.83	3.83	2.83	2.83	4.33	3.61
Wico	4.67	3.50	3.17	2.83	2.83	3.50	3.30
Blue Blizzard	4.33	3.67	4.17	4.33	4.67	4.67	4.30
Pink Blizzard	4.67	3.67	3.67	3.83	2.67	4.00	3.67
Red Blizzard	4.67	4.50	4.33	3.00	dead	dead	4.06
White Blizzard	4.33	3.50	3.67	4.00	4.00	4.00	3.88
Acapulco Compact	5.00	4.33	4.83	4.50	dead	dead	4.62

Lila Mini-cascade	4.33	3.00	3.17	2.50	1.67	2.50	4.62
Lila compact cascade	5.00	4.50	5.00	4.17	dead	dead	2.73

**Goldsmith Plants**

Americana New Violet	5.00	4.33	3.67	2.83	2.67	3.33	3.64
Americana Light Pink	4.67	3.17	3.00	2.00	2.00	2.50	2.73
Freestyle Dark Red	4.00	3.00	3.33	3.83	2.83	3.67	3.39
Freestyle Pink	.	3.83	3.83	3.67	3.83	3.83	3.80
Americana Bright Red	5.00	4.50	3.67	3.00	3.00	3.33	2.73
Americana Cherry Rose	4.33	2.83	3.00	1.83	1.83	2.75	2.73
Americana Dark Red	4.67	3.33	2.83	1.83	2.00	2.67	2.85
Americana Light Pink Splash	4.33	3.83	3.00	2.00	2.00	2.67	3.52
Eclipse Cherry	.	4.50	3.33	3.67	3.00	3.67	3.63
Americana Deep Rose	4.33	3.83	3.00	1.83	1.50	2.67	2.61

**Oglevee**

Bubble Gum	5.00	4.33	3.83	2.17	2.50	3.67	3.45
Cotton Candy	4.67	3.67	3.33	2.17	2.17	3.00	3.03
Evening Glow	4.67	4.00	4.00	3.00	3.00	2.75	3.53
Fireball	5.00	4.83	3.50	3.50	3.17	2.67	3.67
Jessica	4.67	3.33	3.50	2.83	2.00	2.83	3.06
Kim P.A.C.	5.00	4.00	3.50	3.33	2.67	2.83	3.42
Lucille	5.00	5.00	5.00	4.33	3.83	4.17	4.52
Maureen	4.67	3.17	2.83	1.33	1.50	3.50	2.67
North Star P.A.C.	5.00	4.50	3.50	2.67	2.33	3.00	3.36
Patriot Light Pink	4.67	3.50	3.00	1.83	2.17	2.67	3.48
Patriot Cherry Rose	5.00	4.00	3.83	2.83	2.83	3.17	2.82
Patriot Violet	4.33	2.67	3.17	2.17	2.00	3.00	2.76
Peaches	5.00	3.33	3.33	2.83	2.33	2.33	3.03
Raspberry Ice	5.00	4.50	3.50	2.17	2.17	3.50	3.33
Sassy Dark Red P.A.C.	5.00	4.00	3.17	2.50	3.50	3.83	3.55
Sophia	4.67	3.83	3.33	2.67	2.17	2.83	3.12
Evka P.A.C.	5.00	4.83	5.00	3.67	dead	dead	4.64
Global Neon Cherry	5.00	4.17	3.50	3.33	3.67	4.00	4.70
Global Merlot	5.00	4.50	4.83	4.67	4.83	4.50	3.85
Global Ruby Red	4.00	3.67	3.83	2.17	3.00	4.67	3.52
LSD P#0.05	0.74	0.62	0.58	0.74	0.82	0.69	0.40

Table 3: 1999 geranium cultivar evaluations. Average quality ratings by month and over the entire summer.

CULTIVAR	May	June	July	Aug.	Sept.	Oct.	Average
<b>Ball FloraPlant</b>							
Designer Bright Red	4.00	3.33	3.83	3.33	3.00	2.00	3.18
Designer Dark Red	4.00	3.67	3.83	2.50	2.33	2.00	2.97
Designer Hot Pink	3.67	4.17	4.00	3.17	2.67	1.67	3.18
Designer Light Pink	4.00	4.00	3.50	2.50	2.75	1.75	3.09
Designer Lilac Chiffon	4.33	5.00	4.50	4.00	4.17	3.67	4.27
Designer Picotee Salmon	3.33	3.50	3.50	2.67	2.17	2.00	2.82
Designer Pink Parfait	3.67	3.83	4.17	3.50	3.17	2.50	3.45
Designer Purple Rose	4.00	4.17	4.83	4.17	4.50	3.17	4.15
Designer Red	4.33	4.33	4.17	3.83	3.83	3.83	4.03
Designer Rose	3.33	4.17	4.33	3.33	3.00	1.67	3.30
Designer Salmon	4.33	3.83	4.33	4.33	4.17	3.00	3.97
Designer Salmon Rose	2.67	2.67	3.00	3.17	2.67	2.33	2.76
Designer Violet	3.33	4.50	4.00	2.17	2.17	2.25	3.06
Designer White	4.67	3.17	3.83	3.33	2.67	2.50	3.24
Designer WhiteFire	2.67	1.50	1.00	1.00	1.00	1.00	1.30
Fantasia Coral	3.33	4.83	4.67	4.67	4.67	4.67	4.58
Fantasia Flame	4.67	2.50	3.50	3.83	3.67	3.67	3.55
Fantasia Flamingo Rose	3.67	3.33	4.17	4.33	3.50	3.50	3.76
Fantasia Pink Shell	3.67	3.33	3.50	3.17	2.50	3.00	3.20
Fantasia Salmon Mist	4.00	4.33	4.17	4.17	4.00	3.67	4.06
FloraStar Starburst Red	4.33	3.00	2.50	1.50	1.17	1.00	2.06
Showcase Bright Red	3.33	3.17	3.67	3.50	3.00	2.67	3.21
Showcase Light Lavender II	2.00	2.67	3.83	2.67	1.67	1.83	2.48
Showcase Light Salmon	3.33	4.17	4.83	4.33	4.33	3.33	4.12
Showcase Pink Parfait	3.00	4.00	3.50	3.00	3.00	3.00	3.27
Showcase Red	3.67	4.50	3.83	3.50	3.00	2.50	3.48
Showcase Scarlet	3.67	4.83	4.67	5.00	5.00	5.00	4.79
Colorcade Burgundy	4.00	4.83	4.33	4.33	4.83	4.67	4.55
Colorcade Lavender	4.00	4.50	4.50	3.67	3.33	3.50	3.91
Colorcade Lilac	4.00	4.17	4.00	3.83	3.17	3.33	3.73
Colorcade Pink	4.67	5.00	4.83	5.00	5.00	4.83	4.91
Galleria Ruby Red	2.67	2.67	2.83	1.83	1.67	1.50	2.15
Galleria SnowFire	3.00	3.83	4.33	4.00	3.17	3.17	3.64
Galleria Sunrise	4.00	4.83	5.00	5.00	5.00	5.00	4.88
<b>Fischer USA</b>							
Atlantis 96	3.33	4.33	3.67	3.67	3.33	3.17	3.61
Blues	3.33	2.50	2.50	2.50	2.17	2.00	2.42
Boogy	4.00	4.50	4.33	4.67	4.17	4.00	4.30



Brasil 99	3.67	3.50	2.17	1.83	1.17	1.17	2.12
Bravo	4.00	4.67	4.00	3.17	2.67	2.17	3.39
Bravo Light Pink	3.00	3.67	4.00	3.17	2.50	2.17	3.09
Calypso	2.67	3.67	3.00	1.83	1.67	2.25	2.52
Charmant	4.00	4.50	4.50	3.67	3.67	2.83	3.85
Diabolo 98	3.67	4.33	4.00	4.17	3.17	2.67	3.67
Dolce Vita	3.00	4.33	3.50	2.83	2.17	1.50	2.88
Gloria 98	4.00	4.33	3.83	3.83	3.50	2.83	3.70
Grand Prix	4.33	4.83	5.00	4.50	4.83	3.50	4.52
Jazz 99	4.00	4.67	4.00	3.50	2.83	3.00	3.64
Kardino	3.67	3.50	3.33	2.50	2.50	2.33	2.91
Lotus	4.00	4.83	4.67	3.00	2.50	2.50	3.89
Magic 99	3.67	3.50	3.00	3.50	2.67	2.67	3.12
Montevideo	3.67	4.50	4.50	4.17	3.50	3.33	3.97
Noblesse 99	4.00	5.00	4.33	3.00	2.50	3.00	3.62
Rocky Mt. White	5.00	4.17	4.67	3.50	3.17	3.00	3.82
Samba	3.33	4.00	3.83	3.50	3.17	2.83	3.45
Schoene Helena	3.67	3.50	3.83	4.00	4.33	3.17	3.76
Tango	3.00	2.67	3.33	2.83	2.50	2.17	2.73
Tango Dark Red	4.33	4.83	4.33	2.83	2.33	1.83	3.33
Tango Light Salmon	3.33	2.83	2.50	2.17	2.50	1.83	2.45
Tango Orange	3.67	3.50	2.83	2.33	2.17	1.83	2.64
Tango Violet	3.00	3.00	2.50	1.67	1.33	1.00	2.00
Tiffany 96	3.00	3.33	3.00	2.83	2.33	1.67	2.67
Amethyst	3.33	3.33	3.33	2.83	2.33	2.33	2.88
Barock 99	3.00	3.50	4.00	4.67	4.17	4.17	4.00
Beach 99	4.33	5.00	5.00	5.00	5.00	4.00	4.76
Belladonna 99	3.00	3.00	2.83	2.00	1.83	2.33	2.45
Blanche Roche	3.00	3.67	4.17	3.67	2.50	2.33	3.24
Bonito	3.00	3.50	3.83	3.67	3.17	3.33	3.45
Comedy	3.67	4.17	4.00	2.17	1.00	1.00	3.15
Lambada 98	3.00	4.00	3.67	2.50	1.50	1.33	2.64
Luna 98	4.00	4.00	3.50	2.83	1.83	2.33	3.00
Mandarin	4.00	4.00	4.50	4.17	4.33	3.83	4.15
Mexicana	3.00	3.83	4.67	4.83	4.83	4.00	4.30
Molina	3.33	4.17	4.83	4.83	4.33	3.67	4.27
Picasso	3.33	2.50	2.83	2.33	1.67	2.00	2.36
Ragtime 99	4.00	4.50	4.83	4.67	3.67	4.17	4.33
Taj Mahal	4.00	3.50	3.67	3.83	3.67	3.67	3.70
Wico	3.00	2.67	3.17	2.50	2.33	2.00	2.58
Blue Blizzard	3.00	3.83	4.67	4.83	4.50	3.67	4.18
Pink Blizzard	4.00	4.17	4.67	4.50	3.67	4.17	4.21
Red Blizzard	5.00	5.00	4.50	2.83	dead	dead	4.31
White Blizzard	4.33	4.67	4.67	5.00	4.67	4.33	4.64
Acapulco Compact	4.67	5.00	5.00	4.00	dead	dead	4.67

Lila compact cascade	4.67	4.83	5.00	3.50	dead	dead	4.48
Lila Mini-cascade	3.00	2.67	3.50	3.00	1.83	2.00	2.64

### Goldsmith Plants

Americana Bright Red	2.00	3.00	3.00	2.50	2.00	1.83	2.42
Americana Light Pink	2.33	3.17	3.00	2.67	2.17	1.33	2.45
Freestyle Dark Red	2.00	3.00	3.00	2.83	1.67	1.83	2.42
Freestyle Pink	.	3.50	3.67	3.33	2.83	3.00	3.27
Americana Dark Red	2.33	3.00	3.33	2.17	1.50	1.33	2.27
Americana Deep Rose	2.00	2.67	2.83	1.67	1.00	1.00	1.85
Americana Light Pink Splash	3.00	3.67	3.67	2.67	2.17	1.33	2.73
Americana New Violet	2.00	2.67	2.67	2.17	1.67	1.17	2.06
Eclipse Cherry	.	3.17	3.00	3.00	2.33	2.33	2.77
Americana Cherry Rose	2.00	2.00	2.17	1.50	1.17	1.00	1.65

### Oglevee

Bubble Gum	3.00	3.17	2.33	1.50	2.00	1.00	2.09
Cotton Candy	3.67	4.17	3.33	2.67	2.67	1.67	2.97
Evening Glow	3.67	4.50	4.17	3.17	3.00	2.50	3.52
Fireball	3.67	4.00	2.67	2.50	2.17	1.67	2.70
Jessica	3.67	3.33	3.83	3.83	3.50	2.83	3.48
Kim P.A.C.	4.00	4.67	4.50	4.33	4.17	3.00	4.12
Lucille	4.33	5.00	5.00	4.83	4.50	4.00	4.64
Maureen	3.33	3.33	2.50	1.33	1.00	1.00	1.97
North Star P.A.C.	4.00	4.83	4.83	3.67	3.50	1.83	3.76
Patriot Cherry Rose	3.67	3.83	3.50	2.83	3.00	3.17	3.30
Patriot Light Pink	4.00	3.67	3.00	2.17	1.50	1.33	2.48
Patriot Violet	3.00	2.17	2.83	2.33	1.67	1.33	2.15
Peaches	4.00	3.67	3.50	3.50	3.00	2.17	3.24
Raspberry Ice	3.67	4.17	3.50	2.67	2.50	2.33	3.09
Sassy Dark Red P.A.C.	4.00	3.67	2.67	2.17	2.17	2.17	2.70
Sophia	3.33	4.50	4.33	3.17	2.50	2.00	3.30
Evka P.A.C.	5.00	4.50	4.50	2.50	dead	dead	4.16
Global Merlot	3.67	4.00	3.83	3.67	3.33	3.00	3.58
Global Neon Cherry	4.00	4.50	3.83	3.00	2.83	3.17	3.52
Global Ruby Red	3.67	2.83	3.33	2.00	1.33	2.17	2.45
LSD P#0.05	0.67	0.73	0.75	0.93	1.06	1.05	0.60

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Table 4: 1999 Geranium cultivar evaluations. Overall combined ratings of leaf chlorosis and plant quality for early, mid, and late summer and an overall rating for the entire data collection period (May 25 - October 12).

CULTIVAR	Type	May&June	July&Aug	Sept&Oct	Overall
<b>Ball FloraPlant</b>					
Designer Bright Red	zonal	3.89	3.33	2.58	3.21
Designer Dark Red	zonal	3.94	3.13	2.50	3.12
Designer Hot Pink	zonal	4.11	3.42	2.33	3.21
Designer Light Pink	zonal	3.78	2.96	2.25	3.02
Designer Lilac Chiffon	zonal	4.72	3.92	3.71	<b>4.06</b>
Designer Picotee Salmon	zonal	3.78	3.17	2.42	3.06
Designer Pink Parfait	zonal	3.78	3.46	2.38	3.15
Designer Purple Rose	zonal	4.22	4.29	3.63	<b>4.03</b>
Designer Red	zonal	4.17	3.50	3.29	3.61
Designer Rose	zonal	3.83	3.17	2.21	3.00
Designer Salmon	zonal	4.00	4.00	3.25	3.73
Designer Salmon Rose	zonal	3.22	3.54	3.04	3.27
Designer Violet	zonal	3.89	3.00	2.50	3.27
Designer White	zonal	3.78	3.50	2.71	3.29
Designer WhiteFire	zonal	2.44	1.46	1.88	2.00
Fantasia Coral	zonal	4.67	4.79	4.71	<b>4.73</b>
Fantasia Flame	zonal	3.56	3.92	3.50	3.67
Fantasia Flamingo Rose	zonal	3.83	4.42	3.58	3.95
Fantasia Pink Shell	zonal	3.61	3.54	3.44	3.25
Fantasia Salmon Mist	zonal	4.50	4.25	3.71	<b>4.12</b>
FloraStar Starburst Red	zonal	3.39	2.17	1.71	2.33
Showcase Bright Red	zonal	3.72	4.04	3.25	3.67
Showcase Light Lavender II	zonal	2.94	3.38	2.50	2.94
Showcase Light Salmon	zonal	4.28	4.17	3.58	3.98
Showcase Pink Parfait	zonal	4.17	3.50	3.33	3.62
Showcase Red	zonal	4.50	3.75	2.96	3.67
Showcase Scarlet	zonal	4.72	4.92	4.92	<b>4.86</b>
Colorcade Burgundy	ivy	4.33	4.17	4.63	<b>4.38</b>
Colorcade Lavender	ivy	4.28	4.08	3.67	3.98
Colorcade Lilac	ivy	3.89	3.38	3.17	3.44
Colorcade Pink	ivy	4.83	4.54	4.83	<b>4.73</b>
Galleria Ruby Red	zonal	3.06	2.54	2.00	2.48
Galleria SnowFire	zonal	3.67	3.79	3.25	3.56
Galleria Sunrise	zonal	4.56	4.54	4.92	<b>4.68</b>

**Fischer USA**

Atlantis 96	zonal	4.00	3.54	2.92	3.44
Blues	zonal	3.28	2.88	2.50	2.85
Boogy	zonal	4.44	4.46	4.08	<b>4.32</b>
Brasil 99	zonal	3.72	2.17	1.63	2.39
Bravo	zonal	4.67	3.63	2.71	3.58
Bravo Light Pink	zonal	3.94	3.67	2.54	3.33
Calypso	zonal	3.72	2.75	2.69	2.93
Charmant	zonal	4.39	3.67	2.88	3.58
Diabolo 98	zonal	3.94	4.00	3.04	3.64
Dolce Vita	zonal	4.06	3.25	2.04	3.03
Gloria 98	zonal	4.06	3.79	3.21	3.65
Grand Prix	zonal	4.56	4.42	3.75	<b>4.21</b>
Jazz 99	zonal	4.50	3.50	3.04	3.61
Kardino	zonal	3.72	3.04	2.67	3.09
Lotus	zonal	4.78	3.88	3.13	3.95
Magic 99	zonal	3.78	3.33	2.79	3.26
Montevideo	zonal	4.50	4.13	3.25	3.91
Noblesse 99	zonal	4.61	3.67	3.38	3.89
Rocky Mt. White	zonal	4.28	3.67	2.92	3.56
Samba	zonal	4.11	3.58	3.08	3.55
Schoene Helena	zonal	3.89	3.67	3.50	3.67
Tango	zonal	3.39	3.42	2.71	3.15
Tango Dark Red	zonal	4.61	3.63	2.75	3.58
Tango Light Salmon	zonal	3.61	2.63	2.63	2.89
Tango Orange	zonal	3.67	2.67	2.17	2.76
Tango Violet	zonal	3.56	2.54	2.04	2.64
Tiffany 96	zonal	3.39	3.33	2.71	3.12
Amethyst	ivy	3.39	3.04	2.63	2.98
Barock 99	ivy	3.33	4.00	3.96	3.80
Beach 99	ivy	4.61	4.92	4.54	<b>4.70</b>
Belladonna 99	ivy	3.11	2.38	1.83	2.38
Blanche Roche	ivy	4.11	3.96	2.83	3.59
Bonito	ivy	3.72	4.00	3.88	3.88
Comedy	ivy	3.94	2.63	1.50	2.64
Lambada 98	ivy	3.61	2.71	1.92	2.67
Luna 98	ivy	4.00	3.08	2.38	3.08
Mandarin	ivy	3.78	3.96	3.50	3.74
Mexicana	ivy	3.89	4.58	4.38	<b>4.32</b>
Molina	ivy	3.61	4.21	3.83	3.91
Picasso	ivy	3.17	2.71	2.50	2.76
Ragtime 99	ivy	4.22	4.33	3.88	<b>4.14</b>
Taj Mahal	ivy	3.83	3.54	3.63	3.65
Wico	ivy	3.33	2.92	2.67	2.94

Blue Blizzard	ivy	3.72	4.50	4.38	<b>4.24</b>
Pink Blizzard	ivy	4.06	4.17	3.63	3.94
Red Blizzard	ivy	4.78	3.56	dead	.
White Blizzard	ivy	4.17	4.33	4.25	<b>4.26</b>
Acapulco Compact	ivy	4.72	4.58	dead	.
Lila compact cascade	ivy	4.72	4.42	dead	.
Lila Mini-cascade	ivy	3.11	3.04	2.00	2.68

### Goldsmith Plants

Americana Bright Red	zonal	3.67	3.04	2.54	3.03
Americana Cherry Rose	zonal	2.67	2.13	1.75	2.11
Americana Dark Red	zonal	3.28	2.54	1.88	2.50
Americana Deep Rose	zonal	3.22	2.33	1.54	2.29
Americana Light Pink	zonal	3.28	2.67	2.00	2.59
Americana Light Pink Splash	zonal	3.72	2.83	2.04	2.79
Americana New Violet	zonal	3.50	2.83	2.21	2.79
Eclipse Cherry	zonal	.	3.25	2.83	3.04
Freestyle Dark Red	ivy	3.00	3.25	2.50	2.91
Freestyle Pink	ivy	.	3.63	3.38	3.50

### Oglevee

Bubble Gum	zonal	3.83	2.46	2.29	2.77
Cotton Candy	zonal	4.00	2.88	2.38	3.00
Evening Glow	zonal	4.22	3.58	2.94	3.61
Fireball	zonal	4.39	3.04	2.42	3.18
Jessica	zonal	3.61	3.50	2.79	3.27
Kim P.A.C.	zonal	4.39	3.92	3.17	3.77
Lucille	zonal	4.89	4.79	4.13	<b>4.58</b>
Maureen	zonal	3.50	2.00	1.75	2.32
North Star P.A.C.	zonal	4.61	3.67	2.67	3.56
Patriot Cherry Rose	zonal	4.06	3.25	3.04	3.39
Patriot Light Pink	zonal	3.83	2.50	1.92	2.65
Patriot Violet	zonal	2.83	2.63	2.00	2.45
Peaches	zonal	3.83	3.29	2.46	3.14
Raspberry Ice	zonal	4.33	2.96	2.63	3.21
Sassy Dark Red P.A.C.	zonal	4.06	2.63	2.92	3.12
Sophia	zonal	4.11	3.38	2.38	3.21
Evka P.A.C.	ivy	4.78	3.88	dead	.
Global Merlot	ivy	4.28	4.25	3.92	<b>4.14</b>
Global Neon Cherry	ivy	4.39	3.42	3.42	3.68
Global Ruby Red	ivy	3.44	2.83	2.79	2.98
LSD P#0.05		0.42	0.55	0.68	0.45