

Perennial Flower Performance Sun vs. Shade

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INTRODUCTION:

Landscape diversity is becoming increasingly important in local home yards, and other landscapes. The use of perennial flowers is much more popular in these diverse plantings that require planning design and appropriate plant selection. One of the first considerations is the preference of a sun or shady location, which included planting information. This can be difficult to determine because planting recommendations can range from sun to full shade for the same perennial. This situation resulted in the development of a DREC Project to evaluate performance of some perennials under Southwest North Dakota weather conditions.

This 2 year study will evaluate performance of 32 varieties of common perennial flowers in both sun and shade locations. Each variety was replicated twice. Plant characteristics to be evaluated will include: plant establishment, bloom periods, quality and overall bloom value, plant vigor, winter survival and related growth factors. Determining plant hardiness is the first factor to consider in selecting perennials. In order to determine this, the need for a least 2years of data is required. The main objective of this project is to report findings to interested gardeners. Hopefully this will result in increased interest in the use of perennial plants in home landscapes. Refer to **Table #1**, for a list of varieties included in this study.

MATERIALS AND METHODS:

All perennials were planted in 4 X 8 ft. raised beds, with four plants per bed. The soil was amended with a 50-50- mix of top soil and high quality compost material (leaves and grass clippings compost) obtained from the Dickinson Landfill. Plants were fertilized on a monthly basis using 'Miracle Gro' foliar applications. Weeds were controlled by hand-weeding on a as needed basis and in 2006 Preen granules were added twice during the growing season.

Observation evaluations were conducted on a week – bi-weekly basis. Written evaluations were conducted twice during the first year and once in 2006.

ADDITIONAL PLANTING INFORMATION:

The sunny location is located on the south end of the DREC garden. This site receives full sun during the day, with shade in early evening. The shade location is next to the north picnic grounds area. This received full shade until the ice storm of October 10, 2005. Following the storm a lot of trees had to be removed resulting in more sunny conditions. The planting dates were: Sun- June 24, 2005, and shade- June 27, 2005. Perennials at both locations were dead-headed as needed to encourage additional blooming. The plants were not cut-back in the fall to help catch added snow for winter protection.

Initially the sun location was hand-watered. A drip-irrigation system was added in mid-July to provide for more efficient use. The shade location was watered through the use of an automatic sprinkler system in each raised bed.

RESULTS AND DISCUSSION:

Year one sun location observation:

- Plant survival was good 97%. However several perennials suffered from transplant shock, resulting in leaf scorch, browning and wilting of leaves and poor growth. This may effect winter survival.
- Varieties showing the most stress with a (vigor rating) of 0 to 2 were: 'Sun Ray' Lily- dead,
- 'Black Barlow' Columbine, 'Aurea' Bellflower, 'Matrona' Stonecrop, 'Palace Purple' Coral Bells, 'Happy Returns' Daylily, 'Vision' Geranium, 'White Clips'

Bellflower, 'Raspberry Wine' Bee Balm, 'Garden View' Geranium and Lupine.

- Varieties performing the best with a (vigor rating) of 4 to 5 were: 'Variegata' Goldenrod, 'Fireworks' Goldenrod, 'Alexander' Yellow Loosestrife, 'Prairie Dusk' Beard Tongue, 'Brookside' Geranium, 'Golden Pygmy' Leopard's Bane, 'Garden Queen' Globeflower, 'Frosted Violet' Coral Bells, 'Spring Delight' Phlox, 'Vera Jameson' Stonecrop, Soapwort, 'Caesar's Brother' Siberian Iris, 'Thriller' Lady's Mantle, 'Huskers Red' Beardtongue, 'Matrona' Stonecrop, and 'Johnson's Blue' Geranium.
- Insect pressure was very light with basically no damage. However some mite activity was documented.
- Powdery Mildew was documented on 'Raspberry Wine' Bee Balm. This indicates that environmental conditions and variety susceptibility are factors with mildew infections.

YEAR 1 SHADE LOCATION OBSERVATIONS:

- Overall plant survival was 97%. However many perennials were lacking vigor going into winter.
- Disease was more prevalent in the shade location. Powdery mildew and leaf spot diseases were present the most. The effect of disease on winter plant survival will be evaluated in the spring of-2006.
- Animal damage did occur in the shade location. Deer damage included clipping off the ends of plants and trampling damage.
- Hardiness and winter survival will be evaluated in the spring of 2006.
- Varieties showing the most stress with a vigor rating 0-2 were: 'Sun Ray' Lily dead, 'Happy Returns' Daylily, 'Prairie Dusk' Beardtongue, 'Garden View' Bee Balm, 'Golden Pygmy' Leopards Bane, 'Giles Van Hees' Speedwell, 'Spring Delight' Phlox, Soapwort, Lupine, 'Aurea' Bellflower, 'White Clips' Bellflower, 'Woodside'

Columbine, and 'Chicago Heirloom' Daylily.

- Top performing with a vigor rating of 4-5 were: Flag Iris, 'Alexander', Yellow Loosestrife, 'Matrona' Stonecrop, 'Fireworks' Goldenrod, 'Caesar's Brother' Siberian Iris, 'Garden Queen' Globeflower, 'Palace Purple' Coral Bell, 'Vera Jameson' Stonecrop and 'Husker Red' Beardtongue. See **Table # 2** for year one evaluation data summary form.

YEAR 2 OBSERVATIONS FOR BOTH SUN AND SHADE LOCATION:

The second year evaluation was conducted by Jerry Larson, DREC Horticulture Specialist, on June 16, 2006. Evaluation emphasis was for: Winter survival, plant vigor, foliage characteristics, and ornamental value rating along with relative comments.

Winter survival was comparable-sunny site 44% and shade site survival was 56%. Several factors may have contributed to this low survival. The use of raised beds provides for less root protection, snowfall was limited, extended periods of cold winter weather, freezing and thawing in the spring, and in some cases the perennial flowers were in a reduced vigor condition going into winter. No mulch was used which may have helped survival.

Varieties that performed well at both locations with all plants surviving were: Flag Iris, 'Caesar's Brother' 'Siberian Iris', 'Lavender Flame' Speedwell, 'Sun Ray' Lily and 'Golden Queen' Globeflower. Perennials with no survival included: 'Vision' Geranium, Soapwort, 'Babyface' Phlox and 'Raspberry Wine' Bee Balm. Varieties doing better in the sunny site were: 'Prairie Dusk' Beardtongue, 'Frosted Violet' Coral Bells and 'Giles Van Hees' Speedwell. Plants preferring shade were: 'Matrona' Stonecrop, 'Happy Returns' Daylily, and 'Black Barlow' Columbine. Refer to **Table #3** for year 2 evaluation data.

CONCLUSIONS:

This study documented that certain perennials perform differently in Shade vs Sun locations, while other do well in both sunny and shade sites. Overall, transplant shock was more common in sunny sites. This additional stress delayed plant development. Plants in the shade

appeared to be in a more vigorous condition the first year. However winter survival was comparable at the two sites. The main concern in shade is the potential for disease. Winter survival for 2007 will be evaluated.

Flower Performance
Sun vs Shade
2005-06
Table #1

PLANTS EVALUATED	LOCATION RECOMMENDATION	HARDINESS ZONE
1. Sedum, 'Vera Jameson', Stonecrop	Full Sun	3
2. Sedum, 'Matrona', Stonecrop	Sun/Part Shade	3
3. Hemerocallis, 'Chicago Heirloom', Daylily	Full Sun	3
4. Hemerocallis, 'Happy Returns', Daylily	Full Sun/Part Shade	3
5. Geranium asphodeloids, 'Brookside' Geranium	Full Sun/Part Shade	4
6. Geranium sanguineum, 'Vision' Geranium	Sun/Part Shade	3
7. Aquilegia vulgaris, 'Black Barlow' Columbine	Full Sun/Part Shade	3
8. Aquilegia vulgaris, 'Woodside' Columbine	Full Sun/Part Shade	3
9. Campanula, 'Aurea' Bellflower	Part Shade	4
10. Campanula carpatica, 'White Clips' Bellflower	Sun/Part Shade	4
11. Penstemon digitalis, 'Huskers Red' Beard Tongue	Full Sun	3
12. Penstemon, 'Prairie Dusk' Beardtongue	Sun/Part Shade	3
13. Phlox arendsii, 'Babyface' Garden Phlox	Full Sun	4
14. Phlox paniculata, 'Spring Delight' Phlox	Full Sun	4
15. Iris sibirica, 'Ceasar's Brother', Siberian Iris	Sun/Part Sun	4
16. Iris satorosa, 'Flag Iris	Sun/Part Sun	4
17. Veronica, 'Lavender Flame' Speedwell	Full Sun	4
18. Veronica, 'Giles Van Hees' Speedwell	Full Sun	4
19. Lysimachia Punctata, 'Alexander' Yellow Loosteife	Sun/Part Shade	4
20. Lysimachia, 'Golden Alexander-Sundrops' Yellow Loosteife	Sun/Part Shade	4
21. Monarda, 'Raspberry Wine' Bee Balm	Full Sun	4

PLANTS EVALUATED	LOCATION RECOMMENDATION	HARDINESS ZONE
22. Monarda, 'Garden View' Bee Balm	Full Sun	4
23. Lupinus, 'Popcicle' Lupine		4
24. Trollius, 'Garden Queen' Globeflower	Full Sun/Part Shade	3
25. Doronicum, 'Golden Pygmy' Leopard's Bane	Sun/Part Shade	4
26. Liliium, 'Sun Ray' Asiatic Lily	Feet in Shade/and Their Faces in the Sun	3
27. Saponaria pamhylica , 'Soapwort'	Full Sun	3
28. Solidago flexicaulis, 'Variegata' Goldenrod	Sun/Part Sun	4
29. Alchemilla molis, "Thriller' Lady's Mantle	Sun/Part Shade	3
30. Solidago rugosa, 'Fireworks' Goldenrod	Sun/Part Shade	4
31. Heuchera micrantha, 'Palace Purple' Coral Bells	Sun/Part Shade	4
32. Heuchera, 'Frosted Violet' Coral Bells	Sun/Part Shade	4
33. Geranium, 'Johnson Blue'	Full Sun/Shade	4

Perennial Flower Performance Data
Sun vs. Shade

Dickinson Research Extension Center 2005-06
Table #2

Foliage Color Codes		
G -Green	PG -Purple	
DG -Dark Green	YG -Yellow Green	
LG -Light Green	BG -Blue Green	

Bloom Color Codes		
B -Blue	P -Purple	
BU -Burgandy	R -Red	
M -Mixed	W -White	
PK -Pink	Y -Yellow	
NA -Not Applicable		

DATE EVALUATED: September 19, 2005 **BY: Jerry Larson & Frank Kutka**
LOCATION: Sunny **EVALUATION SCALE: 1-5**

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
28.' Variegata' Goldenrod	1	4.5"	16.5"	4	NA	NA	NA	G	4	Some leaf scorch, compact growth
30.' Fireworks' Goldenrod	1	33"	16"	5	Y	4		G	4	Excellent fall color-blooms
16. Flag Iris	1	20"	14.5"	3	NA	NA	NA	YG	3	Yellow leaves, tip burn
19.' Alexander' Yellow Loose Strife	1	28"	17"	4	NA	NA	NA	Y	3	Some witches broom, transplant shock
4.' Happy Returns' Daylily	1	12"	26"	2	NA	NA	NA	LG	2	Poor growth, stunted
12.' Prairie Dusk' Beard Tongue	1	16"	12"	4	NA	NA	NA	G	4	Healthy, compact growth

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
5. 'Brookside' Geranium	1	24"	14"	4	NA	NA	NA	LG	4	Mounded growth form
22. 'Garden View' Bee Balm	1	9"	22"	3	BU	NA	NA	LG	2	Leaf drop mildew
25. 'Golden Pymy' Leopards Bane	2	5.5"	14"	4	NA	NA	NA	G	4	Large leaves
10. 'White Clips' Bellflower	2	4"	6"	2	W	2	2	G	2	Poor growth , small
24. 'Garden Queen' Globeflower	2	19"	15"	4	BU	NA	NA	DG	4	Unique leaves, upright growth
6. 'Vision' Geranium	2	6.5"	8"	2	NA	NA	NA	G	2	Weak, showing stress
32. 'Frosted Violet' Coral Bell	2	9"	19"	5	NA	NA	NA	P	4	Very nice, compact mound
18. 'Giles Van Hees' Speedwell	2	10"	13"	3	P	3	3	G	3	Elongated flower spikes
3. 'Chicago Heirloom' Daylily	2	20"	33"	3	NA	NA	NA	LG	2	Brown leaves , tip burn
14. 'Spring Delight' Phlox	2	3.5"	17"	3	NA	NA	NA	G	3	Creeping/spreading growth

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
1. 'Vera Jameson' Stonecrop	3	7.5"	28"	5	PK	4	P	4	5	VARIETY
27. Soapwort	3	10"	34"	4	PK	3	G	3	3	Leggy growth
13. 'Baby face' Phlox	3	14"	10"	3	PK	2	G	2	2.5	Leaf spot lower leaves
30. 'Fireworks' Golderod	3	30"	22"	5	Y	5	G	4	5	Lots of Bees, upright growth, healthy
23. Lupine	3	12"	23"	3	NA	NA	LG	3	3	Some brown leaves, transplant shock
26. 'Sun Ray' Lily	3	13"	4"	0	NA	NA	NA	0	1	Top growth appears dead
7. 'Black Barlow' Columbine	3	5"	7"	1	NA	NA	BG	2	2	Mildew, poor growth
28. 'Variegata' Goldernrod	3	20"	32"	3		NA	Varigated G	3	2.5	Sport Growth
9. 'Aurea' Bellflower	4	1.5"	3"	1	NA	NA	Y	1	1	Extremely poor growth
15. 'Matrona' Stonecrop	4	23"	29"	5	PK	5	DG	5	5	Purple stems ,Bees
15. 'Ceasars Brother' S. Iris	4	17"	28"	1	NA	NA	NA	1	1	Poor condition, lots of stress

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
17.'Lavender Flame' Speedwell	4	15"	19"	3	NA	NA	DG	3	3	Compact growth
21.'Raspberry Wine' Bee Balm	4	31"	10"	2	Bu	NA	YG	1	2	Dropped leaves, mildew, ugly
29.'Thriller' Ladies Mantle	4	6.5"	15"	4	NA	NA	G	4	4	Unique round leaves, compact
11.'Husker Red' Beard Tongue	4	18"	5"	2	NA	NA	PG	3		Poor Growth
8.'Woodside' Columbine	4	15"	27"	3	NA	NA	LG	2	2	Spreading growth, leggy, yellow leaves, leaf spot, mildew
14.'Spring Delight' Phlox	5	4"	10"	3	NA	NA	G	3	3	Yellow leaves, spreading ground cover
24.'Golden Queen' Globe Flower	5	9"	11"	3	NA	NA	G	3	3	Unique leaves, brown leaves,
27.'Soapwort	5	9"	17"	3	P	NA	BG	3	3	Spreading, seed heads
12.'Prairie Dusk' Beard Tongue	5	12"	12"	4	NA	NA	DG	4	4	Healthy, attractive, foliage

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
20. 'Golden Alexander' Yellow Loose Strife	5	23"	16"	3	NA	NA	Varigated G	3	3	Spots, leaf scorch, lacks vigor
4. 'Happy Returns' Daylily	5	17"	14"	3	NA	NA	G	3	3	Limited growth, brown leaves
6. 'Vision' Geranium	5	10"	13"	3	P	2	G	4	3	Poor growth, unique leaves
1. 'Vera Jameson' Stonecrop	5	11"	18"	4	P	3	P	4	4	Spreading ground cover, good accent plant
32. 'Frosted Violet' Coral Bells	6	10"	16"	4	NA	NA	GP	5	4	Attractive foliage, mounded growth
11. 'Husker Red' Beard Tongue	6	21"	16"	4	NA	NA	P	4	4	Very Health
10. 'White Clips' Bellflower	6	4.5"	6"	3	W	NA	G	2	2	Small, poor growth
21. 'Raspberry Wine' Bee Balm	6	29"	7"	2	NA	NA	YG	2	2	Chlorpois ,leaf drop, brown stems
22. Garden View' Geranium	6	22.5"	16"	3	Bu	2	YG	2	2	Chlorpois, leaf drop, volunteers

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
29. 'Thriller' Lady's Mantle	6	7.5"	15"	5	NA	NA	NA	G	4	Large unique leaves, mounded
28. 'Variegata' Goldenrod	6	7"	13"	4	NA	NA	NA	G	3	Mildew lower leaves
17. 'Lavender Flame' Speedwell	6	15"	11"	3	NA	NA	NA	G	3	Serious leaf spot, dead blooms
5. 'Brookside' Geranium	7	17"	21"	5	P	NA	NA	G	5	Bright bloom color, attractive foliage, mounding
19. 'Alexander' Yellow Loosestrife	7	19"	18"	4	NA	NA	NA	Variegated G	3	Spots, leaf scorch
15. 'Ceasar's Brother' Siberian Iris	7	13"	17"	4	NA	NA	NA	G	3	Brown leaf tips
13. 'Babyface' Phlox	7	14	10	3	P	3	3	G	3+	Leaf spot, unique double bloom
9. 'Aurea' Bellflower	7	1.5"	3"	1	NA	NA	NA	Y	1	poor growth & vigor,
26. 'Sun Ray' Lily	7	14"	2"	1	NA	NA	NA	NA	1	Top growth , appears dead
2. 'Matrona' Stonecrop	7	22.5"	17.5"	4	P	4	4	PG	4	White spots on leaves, Bees

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
18.'Giles van Hees' Speedwell	7	8"	9"	4	P	3	G	3	3+	Attractive blooms, small
12.'Prairie Dusk' Beard Tongue	8	15"	16"	3	NA	NA	DG	4	3	No blooms, some leaf drop
31.'Palace Purple' Coral Bell	8	9"	5"	1	NA	NA	PG	1	1	Poor growth, vigor
8.'Woodside' Columbine	8	12"	18"	3	NA	NA	YG	3	3	Stem lodging, spreading growth
3.'Johnson's Blue' Geranium	8	9"	5"	5	NA	NA	G	5	5	Unique leaves, mounded
16.'Flag Iris	8	9.5"	12"	4	NA	NA	G	3	3	Limited Growth, brown leaf tips
23.'Lupine	8	12"	8.5"	2	NA	NA	YG	2	2	Leaf scorch, twisted leaves
7.'Black Barlow' Columbine	8	10.5"	8"	2	NA	NA	G	2	2	Poor, leggy, growth
25.'Golden Pygmy' Leopards Bane	8	7"	11.5"	4	NA	NA	G	4	3+	Compact, mounded, attractive leaves

Shade Bed	Bed #	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
31. 'Palace Purple' Coral Bell	11	16"	7.5"	3	NA	NA	PG	4	3	Holes in leaves, mounded growth
30. 'Fireworks' Goldenrod	11	29"	3"	4	Y	3	DG	3	4	Slow growth, upright
16. Flag Iris	11	18"	39"	4	NA	NA	G	3	3	Leaf scorch, brown tips
19. 'Alexander' Yellow Loose Strife	11	16.5"	24"	4	NA	NA	Varigated G	3	3	Attractive foliage, brown tips
4. 'Happy Returns' Daylily	11	15.5"	31"	2	NA	NA	G	2	2	Poor growth, brown leaves
12. 'Prairie Dusk' Beard Tongue	11	13.5"	2'	1	NA	NA	G	1	1	Top die back, animal damage
5. 'Brookside' Geranium	11	17"	4'	3	NA	NA	G	3	3	Lacks mounded growth, deer damage, upright
22. 'Garden View' Bee Balm	11	15"	8"	2	NA	NA	YG	2	2	Mildew, Poor leaf development, leggy
25. 'Golden Pygmy' Leopard Bane	12	5"	5"	2	NA	NA	YG	2	2	Deer injury, poor growth, small
10. 'White Clips' Bellflower	12	4"	5"	3	NA	NA	G	2	3	Limited growth, compact mounded

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage			O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value	Value		
24 'Garden Queen' Globe-flower	12	10"	17"	3	NA	NA	NA	G	3	3	Broken stems, attractive foliage
6 'Vision' Geranium	12	6.5"	12"	3	NA	NA	NA	G	3	3	Brown tips mounded, round leaves
32. 'Frosted Violet' Coral Bell	12	6"	13.5"	3	NA	NA	NA	PG	4	3	Attractive foliage, leaf shape
18 'Giles Van Hees' Speedwell	12	6"	4"	1	NA	NA	NA	G	1	2	Stunted, looks sick
3 'Chicago Heirloom' Daylily	12	18.5"	16"	3	NA	NA	NA	LG	3	3	Brown leaves, spreading growth
14. 'Spring Delight' Phlox	12	12"	7"	1	NA	NA	NA	G	1	1	Purple stems, poor growth, brown leaves
27 Soapwort	13	14"	8.5"	2	NA	NA	NA	G	2	2	Poor, spreading growth, leggy
13 'Babyface' Phlox	13	14"	3"	3	P	2	2	DG	3	3	Holes in leaves upright growth

VARIETY	Bed	Size		Bloom		Foliage			O. Value Rating	Comments
		Ht.	Width	Plant Vigor	Color	Quality	Color	Value		
20 'Golden Alexander' Yellow Loosestrife	13	15.5"	12"	3	NA	NA	Variegated	3	2	Lodge stems, limited growth
14. 'Vera Jameson' Stonecrop	13	16"	10"	3	P	4	PG	4	4	Brown spots, holes in leaves, spreading
23. Lupine	13	17"	4"	2	NA	NA	G	2	1	Sparse growth, lacks vigor
26. 'Sun Ray' Lily	13	15"	15"	0	NA	NA	NA	NA	0	Above ground growth appears dead
7. 'Black Barlow' Columbine	13	10"	10"	3	NA	NA	G	3	3	Leaf spot, leggy growth
28. 'Golden Alexander' Yellow Loose Strife	13	6"	14"	3	NA	NA	LG	3	3	Holes in leaves, large leaves lays on ground
9. 'Aurea' Bellflower	14	3"	5"	2	NA	NA	Y	2	2	Small compact, limited growth
2. 'Matrona' Stonecrop	14	25"	23"	4	P	3	G	4	4	Holes in leaves, upright
15. 'Caesar's Brother' Siberian Iris	14	14"	29"	3	NA	NA	G	3	3	Leaf spot (better in shade)

VARIETY	Bed	Size		Bloom		Foliage			O. Value Rating	Comments
		Ht.	Width	Plant Vigor	Color	Quality	Color	Value		
17. 'Lavender Flame' Speedwell	14	26'	33'	5	NA	NA	G	4	4	White spots on leaves (better in shade)
21. 'Raspberry Wine' Bee Balm	14	34"	6"	3	NA	NA	G	2	2	No Lower leaves, mildew, ugly
29. 'Thriller' Lady's Mantle	14	8"	13"	3	NA	NA	G	2	2	Leaf scorch, poor growth, brown leaves (+Sun)
11. 'Huskers Red' Beard Tongue	14	14.5"	5"	2	NA	NA	PG	2	2	Poor growth, stunted (+Sun)
8. 'Woodside' Columbine	14	11"	14"	3	NA	NA	G	3	3	Mildew, deer damage, scorch, (+Sun)
30. 'Fireworks' Goldenrod	15	22"	8"	4	Y	4	G	3	4	Brown lower leaves
24. 'Garden Queen' Globe Flower	15	26"	17"	4	NA	NA	G	4	5	Leaf scorch, broken flower stalks
27. Soapwort	15	11"	16"	2	NA	NA	G	2	2	Poor growth, leggy

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
19. 'Alexander' Yellow Loosestrife	15	14"	16.5"	3	NA	NA	NA	Variegated	3	Deer damage, brown leaves
4. 'Happy Returns' Daylily	15	16.5"	18"	3	NA	NA	NA	G	3	Brown tips, limited growth (+Shade)
6. 'Vision' Geranium	15	4-5"	11"	3	NA	NA	NA	G	4	Lacking vigor, limited growth
1. 'Vera Jameson' Stonecrop	15	8"	14"	4	P	3	PG	PG	4	Insect damage
12. 'Palace Purple' Coral Bell	15	11"	16"	4	W	NA	PG	PG	4	Unique foliage, color, shape
32. 'Frosted Violet' Coral Bells	16	8"	14"	3	NA	NA	PG	PG	4	Unique foliage, compact growth
11. 'Huskers Red' Beards-tongue	16	21"	6"	3	NA	NA	PG	PG	4	Purple stem, white spots
10. 'White Clips' Bell-flower	16	4"	2"	1	NA	NA	NA	NA	1	Appears dead

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage		O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value		
21. 'Raspberry Wine' Bee Balm	16	25"	6"	3	BU	2	LG	2	2	Mildew, Chlorosis
22. 'Garden View' Geranium	16	24"	13"	3	R	2	YG	2	2	Chlorosis, mildew, most leaves
29. 'Thriller' Lady's Mantle	16	6.5"	11"	3	NA	NA	G	3	3	Brown leaves unique leaves (+Sun)
28. 'Variegata' Goldenrod	16	6"	13"	3	NA	NA	Variegated	3	3	Holes in leaves, low browning
17. 'Lavender Flame' Speedwell	16	19"	13"	3	NA	NA	DG	3	3	Leaf spot, brown lower leaves
3. 'Chicago' Heirloom Daylily	17	22"	8"	3	NA	NA	G	2	2	Brown leaves, under stress
13. 'Babyface' Phlox	17	17"	1-5"	3	NA	NA	DG	3	3	Brown lower leaves, deer damage

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage			O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value	Value		
9. 'Aurea' Bellflower	17	4"	4"	3	NA	NA	YG	2	2	2	Small, limited value
26. 'Sun Ray' Lily	17	19"	22'	2	NA	NA	NA	2	2	2	Brown tops, brown leaves
2. 'Matrona' Stonecrop	17	22"	3"	3	NA	NA	NA	NA	NA	1	Totally striped by deer
18. 'Giles Van Hees' Speedwell	17	10"	3"	2	P	NA	G	2	2	2	Poor growth, lacks vigor
19. 'Alexander' Yellow Loosestife	17	13"	7"	3	NA	NA	Variegated	3	2	2	Stunted, deer damage
15. 'Caesar's Brother' Siberian Iris	17	22"	16"	4	NA	NA	LG	4	4	4	White spots, some lodging (+Shade)
14. 'Spring Delight' Phlox	18	10"	3"	2	NA	NA	LG	2	2	2	Purple stems chewed leaves
31. 'Palace Purple' Coral Bells	18	7"	14"	3	NA	NA	PG	4	3	3	Limited growth, compact

VARIETY	Bed	Size		Plant Vigor	Bloom		Foliage			O. Value Rating	Comments
		Ht.	Width		Color	Quality	Color	Value			
8. 'Woodside' Columbine	18	7"	14"	2	NA	NA	G	2	2	Mildew, brown leaves	
3 'Chicago Heirloom' Daylily	18	21.5"	30"	2	NA	NA	G	3	2	Deer injury, white spots	
16. 'Flag' Iris	18	17"	24'	4	NA	NA	LG	3	3	Brown tip	
23 Lupine	18									Gone-Dead	
7 'Black Barlow' Columbine	18	10"	7"	4	NA	NA	LG	3	3	Mildew, poor growth	
25 'Golden Pygmy' Leopard's Bane	18	3.5"	7"	3	NA	NA	G	2	2	Stunted	