Mt. Cuba Center
Gardening on a higher level
Research Report



Heuchera

For the Mid-Atlantic Region

George Coombs, Assistant Research Horticulturist

Beauty, low-maintenance, attractive flowers, multi-season interest, drought tolerance, deer resistance, and numerous color options- these are traits every gardener desires, but it's rare to find them all in a single plant. Coral bells, or alumroot, (*Heuchera* spp.) are just about the perfect shade garden plant because they embody all of the qualities listed above. Their popularity is proven by the huge array of cultivars available today. It's hard to walk into any garden center and not be overwhelmed by the choices. And if you couldn't make up your mind this year, don't worry; there will be at least five new ones next year.

This level of excitement has lead to an excessive amount of choices as well as the occasional release of inferior or redundant plants before adequate trialing. For these reasons, Mt. Cuba Center set out to evaluate 83 different cultivars of *Heuchera* derived from two species native to the eastern United States. Those species, *H. americana*, and *H. villosa* have lent hardiness, vigor, and important color components to modern hybrids, transforming shade gardens all over the world.



***H.* 'Hercules'**



Coral bells get their name from the small, reddish-pink flowers that resemble tiny church bells. This name most specifically refers to *H. sanguinea*, a native of the American Southwest, although it is now often used as the common reference to all of the modern hybrids. The other common name sometimes seen for *Heuchera* is alumroot. This designation comes from the astringent, alum-like properties of the roots which were used by Native Americans as a wound treatment.

Heuchera have been grown as garden plants since they were first brought back to the Old World in the 1600s. Popular hybrids were developed in the late 1800s by crossing *H. americana* with *H. sanguinea* and select other species. These old fashioned, green-leaved hybrids were bred for their impressive display of bright red flowers. Little had changed in the world of coral bells until the mid-1980s when a seedling was found in the garden of Nancy Goodwin, then owner of Montrose Nursery. This seedling, a hybrid of *Heuchera americana* 'Dale's Strain' and *H.* 'Palace Purple' was named *H.* 'Montrose Ruby', and its groundbreaking combination of dark foliage and a silver veil became the basis for the modern day explosion of *Heuchera*. All three of these cultivars were included in our trial to help demonstrate how

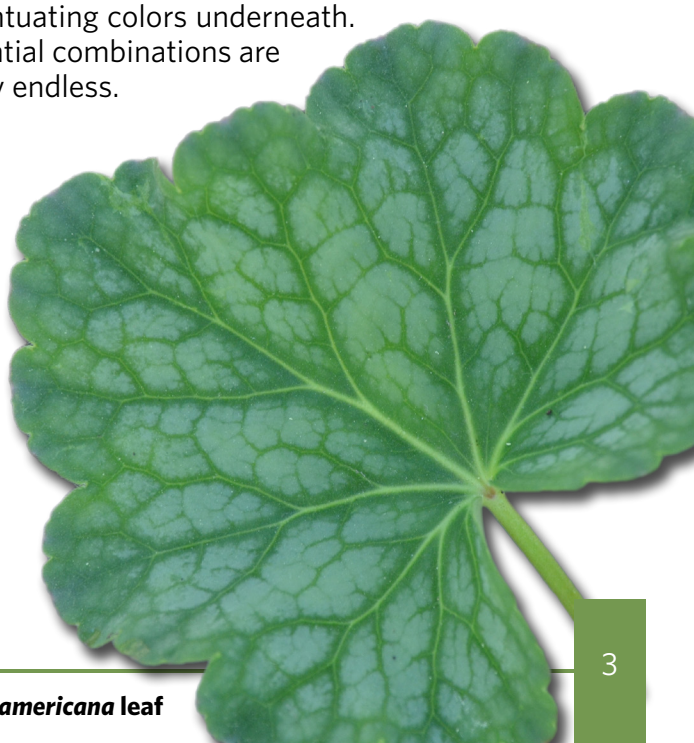


Assortment of *Heuchera* growing in Mt. Cuba Center's Trial Garden.

far breeders have taken the genus. Those breeders, namely Terra Nova Nurseries, The Primrose Path, and Thierry Delabroye, have created the majority of hybrids available today.

Although our trial focused on hybrids of species native to the eastern United States, the genus *Heuchera* is native throughout much of North America with as many as 36 species found in the United States alone. Most *Heuchera* can be found growing in relatively dry, rocky conditions, often in the cracks and crevices of rock faces. These natural growing conditions demonstrate their need for good drainage. However, some species like *H. americana* and *H. villosa* are quite tolerant of normal garden soils.

Heuchera are herbaceous perennials with leaves on long petioles arranged around a thick, almost woody stem. The foliage emerges in spring, with a second flush of growth frequently occurring in late summer. Sometimes coral bells are referred to as evergreen. This is true; however, they only look their best when temperatures are relatively mild. Near freezing temperatures cause the plants to lie flat on the ground thus reducing their appeal. In harsh winters, significant discoloration and burning can also occur. From our experience, it is best to think of their landscape contribution as spring through fall. The leaves of *Heuchera* can vary depending on the parentage. *Heuchera americana* contributes medium sized leaves with a scalloped margin and a prominent silver veil while *H. villosa* and its cultivars generally have large, angular, and hairy leaves. The enormous variety of hybrid cultivars available today also includes selections with leaves that have ruffled margins, prominent vein coloration, and accentuating colors underneath. The potential combinations are seemingly endless.



***Heuchera americana* leaf**

Mt. Cuba Center's trial addressed the need to sift through the enormity of *Heuchera* cultivars and help find the best selections for gardeners in the mid-Atlantic region. We evaluated 83 different cultivars of coral bells for a period of three years (2012-2014). Plants were judged based on their vigor, fullness, and uniformity. Floral display was evaluated separately as most cultivars are predominantly used as foliage plants. The following cultivars, listed in order starting with the highest rated, are selections that excelled for superior performance and appeal. While many plants did well, these 10 selections are sure to flourish for any gardener in the mid-Atlantic.

Heuchera 'Citronelle'

Heuchera 'Citronelle' is a large and vigorous cultivar, growing to approximately 14" high by 30" wide after three years. The fuzzy, electric-yellow leaves emerge in spring with a blinding intensity and slowly fade to bright chartreuse for the rest of the year. This cultivar stood out in our trial for its consistently dense and uniformly mounded habit. 'Citronelle', like other chartreuse cultivars, is sensitive to bright sunlight, and extra care should be provided to make sure it receives shade all day long. When exposed to bright sunlight, the leaves can turn white (bleach) and even start to burn. We observed mild bleaching on the plants in our trial when grown under a shade cloth that provided 60% shade (equivalent to partial shade). However, 'Citronelle' displayed the least amount of bleaching when compared to other chartreuse cultivars.







Heuchera 'Cajun Fire'

Heuchera 'Cajun Fire' is a medium sized, low-growing cultivar (9"h x 22"w) with leaves that emerge plum purple in spring and mature to a reddish purple by early summer. Each leaf has deeply furrowed veins, a slightly puckered surface, and a light sheen which give the foliage a leather-like appearance. The leaves are also somewhat oversized for a plant this size, which really helps to accentuate their texture. 'Cajun Fire' was not one of the most floriferous cultivars in our trial, but its floral display can still be quite attractive. Large, creamy-white flowers held on 18" tall, wine-red stems bloom sporadically from summer to fall.







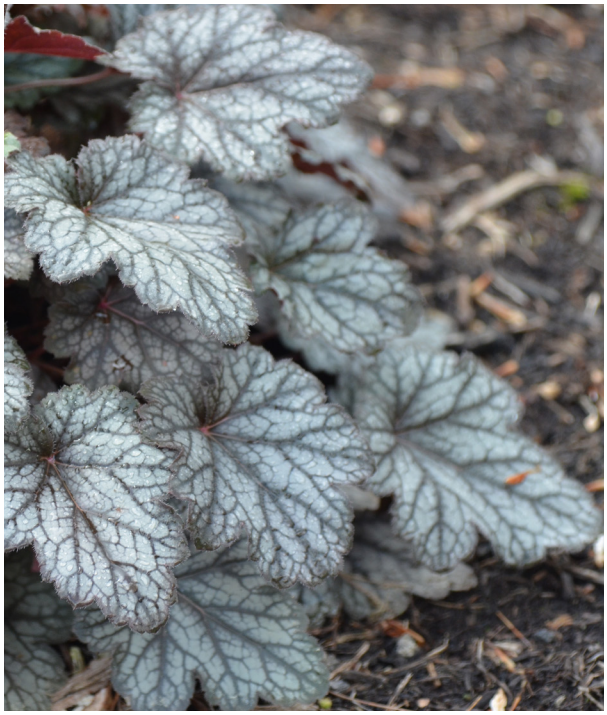
Heuchera villosa 'Bronze Wave'

Heuchera villosa 'Bronze Wave' is another large cultivar (18"h x 38"w after three years) that was recognized for its consistent vigor and habit. The leaves of this cultivar are large, thick, glossy and angular, with a shape reminiscent of a sycamore leaf. The slightly open habit allows for the occasional glimpse of the purple underside of the leaf. The plant's uniform shape and the rigid architecture of the foliage give this cultivar an almost statuesque quality. 'Bronze Wave' also has a uniquely attractive floral display. The small creamy-white flowers are not particularly striking individually, but they create a beautiful effect *en masse*. The number of flowering stalks was modest in 2012, but they steadily increased so that by the third season each plant had well over 60 inflorescences. The overall visual display is something uniquely beautiful and almost grass-like. This is one of those rare plants that will most likely spell success for even those without a green thumb.









Heuchera 'Color Dream'

Heuchera 'Color Dream' was one of the best performing silver-leaved cultivars in our trial. Its habit was consistently full and lush. In spring the foliage emerges predominantly silver but with dark hues of purple and green. These colors begin to homogenize as the season progresses to produce a beautiful silvery leaf with blue-green undertones and accentuating dark green veins. This cultivar would not be highlighted for its floral display; however, its mounding (12"h x 28"w) foliage never failed to impress.





Heuchera 'Steel City'

Heuchera 'Steel City' is a medium sized cultivar (12"h x 30"w) and was one of the most understated but beautiful selections in our trial. Its unique blue-green foliage is a hue not seen in any other cultivar. In early spring, a multitude of muted silver leaves with a purple blush erupt from the crown. As the leaves mature, they become increasingly bluish green. By early summer, numerous wands of dainty pink flowers appear above the plant. In addition to the beautiful foliage color and floral display, 'Steel City' also had a perfectly dense and uniform habit throughout our entire trial. This is not completely surprising as one of its parents is the equally dependable *H. villosa* 'Bronze Wave'. However, it is a shock that 'Steel City' is not more commonly available. It's one of the few plants that excelled in all categories of beauty, performance, and floral display.



Heuchera 'Caramel'

Heuchera 'Caramel' has developed a reputation with gardeners for its excellent habit, interesting color, and durability. Throughout our trial, this reputation has proven to be well-deserved. Peach-colored leaves emerge in spring and slowly age to a pale orange-yellow. When grown under more sunlight the color can become increasingly yellow. Therefore, greater shade is needed for the best coloring 'Caramel' has to offer. *Heuchera* 'Citronelle' was discovered as a random mutation of 'Caramel', thus they share many qualities like excellent vigor and habit. 'Caramel' has large fuzzy leaves that create a dense mound of foliage (15"h x 30"w) which maintains its uniformity all season long.







Heuchera 'Apple Crisp'

Heuchera 'Apple Crisp' is the only petite cultivar to rise to the top of our trial. Measuring just 6" high and 12" wide, it was one of the smallest cultivars we evaluated. The small leaves are medium green with a faint silver veil. The highly ruffled margin creates a texture that greatly adds to the appeal of the plant. Some visitors even commented that it looked like a "cute mound of lettuce". The floral display on this petite plant was truly outstanding. As many as 20 sturdy wands of white flowers are borne in early summer. It was impressive to see so many flowers come from such a small plant. The small stature of 'Apple Crisp' makes it a great choice for containers as well as the front of the border.





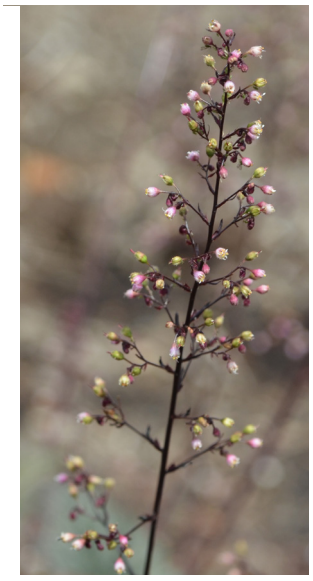


Heuchera 'Frosted Violet'

Heuchera 'Frosted Violet', reaching 14" high by 34" wide, is a predominantly purple cultivar with silver highlights and near-black veins. The foliage is mostly purple in the spring and fall but has a bluish-green cast during the summer months. The plants also exhibit a metallic sheen thanks to the fuzziness of the leaf. The habit is somewhat open like one of its parents, *H. villosa* 'Bronze Wave', but the smaller leaf size creates a more refined texture. 'Frosted Violet' also produces a beautiful floral display when a multitude of tiny flowers rise 32" above the plant in early summer. Uniquely, the flowers are pink as they open, fading to white and then to green as they close after being pollinated. Each inflorescence has individual flowers in varying stages of bloom. This multicolor effect, combined with the huge quantity of tiny flowers, looks like an explosion of confetti.







Plant Characteristics and Performance Summary Ratings

Key: Rating: 5=excellent, 4=good, 3=fair, 2=poor, 1=very poor The top one-third most popular cultivars were given the Visitor Favorite designation.
Sun Tolerance indicates the recommended maximum amount of hours of direct sunlight. Visit our website for more information about each cultivar.

Heuchera	Rating	Leaf Description	Avg. H x W	Floral Display	Flower Color	Bloom Period	Flower Height	Sun Tolerance	Visitor Favorite
H. americana	3.1	green w/ silver veil	10" x 30"	insignificant	none	late May - late June	48"	4 hrs or less	
H. americana 'Dale's Strain'	3.1	green w/ silver veil	10" x 26"	insignificant	none	late May - late June	44"	4 hrs or less	
H. americana 'Garnet'	2.0	green	6" x 20"	insignificant	none	late May - late June	28"	4 hrs or less	
H. americana 'Malachite'	2.7	ruffled, green	8" x 20"	insignificant	white	late May - late June	16"	4 hrs or less	
***H.* 'Apple Crisp'**	**4.3**	**ruffled, green w/ silver veil**	**6" x 14"**	**outstanding**	**white**	**mid-May - mid-June**	**20"**	**4 hrs or less**	**Favorite**
H. 'Autumn Leaves'	2.3	red	10" x 24"	attractive	lt. pink	early June - late July	16"	4 hrs or less	
H. 'Beaujolais'	3.7	rose-pink w/ silver veil	14" x 32"	outstanding	lt. pink	late May - early Aug.	24"	4 hrs or less	
H. 'Berry Marmalade'	2.5	purple w/ silver veil	10" x 22"	insignificant	greenish white	late May - early July	20"	4 hrs or less	Favorite
H. 'Berry Smoothie'	3.4	rose-pink w/ silver veil	10" x 26"	insignificant	lt. pink	early June - late July	22"	4 hrs or less	Favorite
H. 'Blackbird'	3.9	ruffled, bronze-green	9" x 20"	outstanding	pink	late May - late June	18"	4 hrs or less	
H. 'Blackout'	2.9	black	12" x 26"	attractive	lt. pink	mid-June - early Aug.	22"	4 hrs or less	
H. 'Brownies'	4.0	bronze-green	18" x 40"	insignificant	white	mid-July - late Oct.	36"	4 hrs or less	
***H.* 'Cajun Fire'**	**4.5**	**burgundy**	**9" x 22"**	**attractive**	**creamy white**	**late May - late Aug.**	**18"**	**4 hrs or less**	
***H.* 'Caramel'**	**4.4**	**amber**	**15" x 30"**	**attractive**	**white**	**mid-June - late Aug.**	**24"**	**4 hrs or less**	**Favorite**
H. 'Christa'	2.3	amber	10" x 24"	attractive	white	late May - early July	28"	4 hrs or less	Favorite
***H.* 'Citronelle'**	**4.7**	**chartreuse**	**14" x 30"**	**insignificant**	**white**	**early July - mid-Aug.**	**24"**	**0 hrs**	**Favorite**
***H.* 'Color Dream'**	**4.5**	**silver w/ dark veins**	**12" x 28"**	**insignificant**	**white**	**late May - early July**	**26"**	**4 hrs or less**	**Favorite**
H. 'Creole Nights'	4.0	purple	10" x 22"	attractive	white	early June - mid-July	15"	4 hrs or less	Favorite
H. 'Crystal Spires'	3.5	silver w/ green veins	10" x 26"	attractive	lt. pink	late May - early July	20"	4 hrs or less	
H. 'Dark Chocolate'	3.7	bronze-purple w/ silver veil	9" x 20"	outstanding	lt. pink	late May - late June	20"	4 hrs or less	
H. 'Dark Secret'	4.0	ruffled, purple-bronze	14" x 34"	outstanding	lt. pink	mid-June - late July	22"	4 hrs or less	Favorite
H. 'Delta Dawn'	3.5	chartreuse	10" x 22"	insignificant	greenish white	mid-June - late Oct.	16"	0 hrs	Favorite
H. 'Electra'	3.8	chartreuse	10" x 24"	insignificant	white	early June - mid-Aug.	16"	0 hrs	
H. 'Electric Lime'	3.9	chartreuse	10" x 28"	insignificant	white	mid-June - mid-Aug.	18"	0 hrs	
H. 'Encore'	2.8	rose-pink w/ silver veil	12" x 26"	attractive	lt. pink	late May - mid-July	26"	4 hrs or less	
H. 'Fire Chief'	3.5	red	8" x 18"	outstanding	lt. pink	late May - late Sept. (sporadic)	18"	4 hrs or less	Favorite
***H.* 'Frosted Violet'**	**4.3**	**purple w/ silver veil**	**14" x 34"**	**outstanding**	**lt. pink**	**mid-June - late July**	**32"**	**4 hrs or less**	**Favorite**
H. 'Georgia Peach'	2.6	pink w/ silver veil	10" x 24"	insignificant	lt. pink	late May - early July	16"	4 hrs or less	Favorite
H. 'Ginger Peach'	2.1	greenish amber w/ silver veil	10" x 24"	attractive	white	late May - early July	18"	4 hrs or less	
H. 'Green Spice'	3.2	green w/ silver veil	10" x 26"	insignificant	none	late May - late June	44"	4 hrs or less	Favorite
H. 'Guardian Angel'	4.0	silver w/ dark veins	12" x 30"	insignificant	none	late May - early July	42"	4 hrs or less	Favorite
H. 'Harmonic Convergence'	3.6	bronze fading to green w/ silver veil	8" x 20"	outstanding	pink	late May - late June	26"	4 hrs or less	
H. 'Hercules'	3.2	green w/ cream variegation	8" x 24"	attractive	red	early May - mid-June	20"	less than 6 hrs	Favorite
H. 'Jade Gloss'	3.2	silver w/ dark veins	6" x 18"	outstanding	lt. pink	late May - early July	18"	4 hrs or less	
H. 'Kassandra'	3.7	ruffled, amber	16" x 34"	outstanding	white	late July - mid-Sept.	40"	4 hrs or less	
H. 'Mars'	2.6	silver leaves w/bronze veins, copper tones	12" x 30"	insignificant	none	late May - early July	38"	4 hrs or less	
H. 'Midnight Rose'	2.9	purple-black w/ pink spots	8" x 18"	insignificant	greenish white	late May - late June	16"	4 hrs or less	
H. 'Mini Mouse'	3.1	bronze-green w/ silver veil	7" x 20"	outstanding	lt. pink	late May - early July	26"	4 hrs or less	
H. 'Mint Julep'	3.5	very light green w/ silver veil	8" x 20"	insignificant	white	early June - early Aug.	14"	0 hrs	
H. 'Miracle'	4.0	chartreuse	10" x 24"	insignificant	lt. pink	late May - early July	20"	4 hrs or less	Favorite
H. 'Mocha'	3.4	brownish black	12" x 28"	insignificant	white	late May - late Aug.	36"	4 hrs or less	
H. 'Molly Bush'	3.9	black	13" x 34"	insignificant	white	late June - early Aug.	28"	less than 6 hrs	
H. 'Montrose Ruby'	3.0	bronze w/ silver veil	11" x 30"	insignificant	white	late May - early July	25"	4 hrs or less	
H. 'Mystic Angel'	3.3	green w/ silver veil	10" x 30"	insignificant	none	late May - late June	40"	4 hrs or less	
H. 'Obsidian'	3.5	purple-black	10" x 20"	insignificant	greenish white	late May - late June	20"	less than 6 hrs	Favorite
H. 'Palace Purple'	3.6	variable bronze to black	13" x 30"	insignificant	white	late June - mid-Aug.	26"	4 hrs or less	
H. 'Peach Crisp'	3.4	ruffled, rose-pink fading to bronze	6" x 18"	outstanding	lt. pink	late May - late June	14"	4 hrs or less	
H. 'Pear Crisp'	3.1	ruffled, chartreuse	7" x 18"	attractive	greenish white	late May - late June	22"	4 hrs or less	Favorite
H. 'Pinot Gris'	3.4	pale lime-green w/ silver veil	12" x 28"	outstanding	lt. pink	late May - early Aug.	28"	4 hrs or less	
H. 'Pinot Noir'	4.1	green w/ silver veil	12" x 34"	attractive	creamy white	late May - early July	24"	4 hrs or less	
H. 'Pistache'	3.7	chartreuse	16" x 30"	insignificant	white	early Aug. - late Oct.	30"	0 hrs	Favorite

Heuchera	Rating	Leaf Description	Avg. H x W	Floral Display	Flower Color	Bloom Period	Flower Height	Sun Tolerance	Visitor Favorite
H. 'Plum Pudding'	4.0	purple w/ silver veil	10" x 26"	insignificant	greenish white	late May - early July	22"	4 hrs or less	Favorite
H. 'Purple Mountain Majesty'	3.8	purple-bronze	8" x 20"	outstanding	lt. pink	late May - late June	24"	4 hrs or less	
H. 'Purple Petticoats'	3.9	ruffled, bronze-green	10" x 24"	insignificant	greenish white	late May - early July	20"	less than 6 hrs	
H. 'Quilter's Joy'	3.5	bronze-green w/ silver veil	10" x 28"	attractive	white	late May - early July	30"	4 hrs or less	
H. 'Rachel'	4.0	bronze	12" x 28"	insignificant	pink	mid-June - early July	30"	4 hrs or less	
H. 'Raspberry Chiffon'	3.6	bronze-green w/ faint silver veil	11" x 26"	outstanding	lt. pink	late May - mid-July	20"	4 hrs or less	
H. 'Raspberry Ice'	1.9	silver fading to green w/ silver veil	10" x 24"	outstanding	bright pink	late May - early July	24"	4 hrs or less	
H. 'Root Beer'	3.8	red fading to burgundy w/ silver veil	8" x 18"	attractive	pale yellow	late May - early Aug.	22"	4 hrs or less	Favorite
H. 'Rose Mirrors'	2.6	bronze-purple w/ faint silver veil	8" x 20"	attractive	bright pink	late May - early July	22"	4 hrs or less	
H. 'Royal Velvet'	2.4	burgundy w/ silver veil	9" x 22"	outstanding	lt. pink	late May - late June	22"	4 hrs or less	
H. 'Saturn'	3.1	silver w/ dark veins	8" x 22"	attractive	lt. pink	late May - early July	24"	4 hrs or less	
H. 'Silver Light'	3.3	silver w/ dark veins	8" x 18"	insignificant	pink	late May - late June	18"	4 hrs or less	
H. 'Silver Lode'	2.7	silver w/ dark veins	8" x 26"	insignificant	lt. pink	late May - late June	30"	4 hrs or less	
H. 'Silver Scrolls'	3.3	silver w/ dark veins	8" x 26"	attractive	lt. pink	late May - early July	30"	4 hrs or less	Favorite
***H.* 'Southern Comfort'**	**4.2**	**amber**	**14" x 34"**	**insignificant**	**creamy white**	**mid-June - early Aug.**	**24"**	**4 hrs or less**	**Favorite**
***H.* 'Spellbound'**	**4.2**	**silver w/ dark veins and purple highlights**	**12" x 30"**	**insignificant**	**pale yellow**	**early June - early Aug.**	**24"**	**4 hrs or less**	**Favorite**
H. 'Stainless Steel'	3.6	silver	10" x 26"	outstanding	creamy white	late May - early July	32"	4 hrs or less	
***H.* 'Steel City'**	**4.5**	**blue-green w/ faint silver veil**	**12" x 30"**	**outstanding**	**pink**	**late May - early July**	**18"**	**4 hrs or less**	
H. 'Stormy Seas'	3.9	purple-green w/ silver veil	12" x 28"	insignificant	white	late May - early July	25"	4 hrs or less	Favorite
H. 'Strawberry Swirl'	1.7	green w/ silver veil	8" x 25"	insignificant	lt. pink	early Jun - late June	15"	4 hrs or less	
H. 'Tara'	3.6	chartreuse	12" x 28"	insignificant	pale pink	mid-June - early Aug.	30"	0 hrs	Favorite
H. 'Tiramisu'	3.0	chartreuse w/ faint silver veil	12" x 30"	insignificant	greenish white	mid-June - late July	30"	0 hrs	Favorite
H. 'Vienna'	1.6	peach fading to pale green w/ silver veil	6" x 20"	attractive	pink	late May - mid-July	12"	4 hrs or less	
H. villosa 'Autumn Bride'	4.0	green	18" x 42"	attractive	white	late July - late October	36"	4 hrs or less	Favorite
***H. villosa* 'Bronze Wave'**	**4.5**	**bronze-green**	**18" x 38"**	**attractive**	**creamy white**	**late June - early Aug.**	**30"**	**4 hrs or less**	

Plants that did not complete three-year evaluation									
H. 'Caroline'	died yr 3	bronze-green w/ silver veil	9" x 20"	outstanding	lt. pink	late May - early July	22"	4 hrs or less	
H. 'Hearts on Fire'	died yr 2	pink fading to bronze-green w/ silver veil	6" x16"	attractive	lt. pink	late May - early July	15"	4 hrs or less	
H. longiflora	died yr 2	green w/ silver veil	10" x 20"	insignificant	white	late May - early July	32"	4 hrs or less	
H. 'Midnight Bayou'	died yr 2	purple w/ black veins	6" x 18"	not observed	pink	mid-June - early Aug.	20"	4 hrs or less	
H. 'Rose Majesty'	died yr 3	bronze-green fading to green w/ silver veil	9" x 20"	outstanding	rose pink	late May - early July	24"	4 hrs or less	
H. 'Shenandoah Mountain'	died yr 3	bronze w/ silver veil	12" x 28"	attractive	white	late May - early July	20"	4 hrs or less	
H. 'Velvet Night'	died yr 2	purple w/ silver veil and dark veins	12" x 30"	insignificant	none	late May - late June	15"	4 hrs or less	

Visit www.mtcubacenter.org for more information about Trial Garden Research and the Heuchera Evaluation.

More About the Trial

The evaluation took place at Mt. Cuba Center, located near Wilmington, DE (USDA Hardiness Zone 7a/6b). 83 cultivars of coral bells were trialed over a three-year period (2012-2014). Hybrid cultivars were selected based on the inclusion of *H. americana* and/or *H. villosa* in their breeding parentage. Plants were evaluated to assess the following horticultural attributes: habit, vigor, bloom time, flower color, sun tolerance, pest and disease resistance, and adaptability to environmental conditions. Five plants of each cultivar were spaced linearly on two-foot centers. They were grown under a woven shade cloth that provided a uniform 60% shade to all cultivars. A sixth plant of each cultivar was planted in full sun to assess sun tolerance over a two-year period. The soil is best described as a clay-loam with a pH near 6.5. Each cultivar was measured weekly and assigned a rating based on a scale of 1-5 (1 being poor and 5 being excellent). The main attributes contributing to the overall rating were habit uniformity and foliage density. No regard was given to the actual color of the foliage in order to provide unbiased performance data. Floral display was evaluated on a scale of 1, 3, or 5 (insignificant, attractive, or outstanding). Each cultivar was planted from a 1 or 2 quart pot in May of 2012. Supplemental water was given as needed only during the first season. Plants were cleaned up early each spring to remove winter damaged foliage and again in August to remove faded leaves. Weekly ratings reflected the way living plants looked that week. Losses were factored in at the end of the trial by deducting points for two or more deaths (2-3 deaths = -0.25, 4-5 deaths =-0.5). Deaths of only one plant did not result in a deduction.

Weather

Trials at Mt. Cuba Center run for a period of at least three years in order to evaluate performance through a variety of weather conditions. In October of 2012, we received 8.6 inches of rain (normal rainfall for that time of year is 3.4 inches). Another period of record rainfall occurred during the summer of 2013 when 19 inches of rain fell during June and July (normal rainfall would be approximately 9 inches). April of 2014 also experienced more than 4 inches over the average amount. After each instance, there were significant losses among many cultivars due to stem rot (see Stem Rot on pg. 14 for a list of most affected cultivars). A relatively harsh winter also occurred from 2013-2014. Significant snowfall accompanied temperatures ranging from 5-8 degrees below normal from January through March. Winter hardiness is generally not thought of as a problem with *Heuchera*; however, the harsh winter may have contributed to the reduced floral display we observed in 2014.

*Data was collected from the Delaware Environmental Observing System weather station located at Mt. Cuba Center and compared to historical averages from the National Weather Service for Wilmington, DE.

Heuchera 'Southern Comfort'

Heuchera 'Southern Comfort' is nearly identical in color to *H.* 'Caramel' with peach-colored leaves that fade to pale orange-yellow as they mature. However, 'Southern Comfort' has a much larger leaf which tends to bend downward at the tip, resulting in a habit that is just as large (14"h x 34"w) but looks more relaxed. Like 'Caramel', 'Southern Comfort' is somewhat of a "shy bloomer" but is recommended for its attractive three-season foliage.





Heuchera 'Spellbound'

Heuchera 'Spellbound' was by far the most striking cultivar in our trial. The pure silver leaves have near-black veins and develop pink highlights in cooler weather. 'Spellbound' forms dense mounds of foliage (12" high by 30" wide) whose oversized, strongly lobed, and cup-shaped leaves create a dynamic silhouette. The cup-shape of the leaves also helps show off their purple undersides. A few pale yellow flowers were produced throughout summer but were not determined to be an important feature of the plant. However, almost any flower would be considered an unwanted distraction from this amazing foliage.







Additional Top Performers

Nine other *Heuchera* did not make the top ten, but still performed incredibly well over our three-year trial.

Heuchera villosa 'Autumn Bride'

Heuchera villosa 'Autumn Bride' is a large, vigorous, and very dependable cultivar. It's great for use in large masses and naturalizing. 'Autumn Bride' is usually grown from seed so variability between individuals is common.



Heuchera 'Brownies'

Heuchera 'Brownies' is one of the largest cultivars from our trial. It has leaves that emerge bronze and fade to green with a contrasting purple underside.



Heuchera 'Creole Nights'

Heuchera 'Creole Nights' develops attractive mounds of deep purple foliage that maintain their color all season long.



Heuchera 'Dark Secret'

Heuchera 'Dark Secret' develops dense mounds of ruffled, purplish bronze foliage. It also has an outstanding display of airy, light pink flowers in early summer.



Heuchera 'Guardian Angel'

Heuchera 'Guardian Angel' has large silver leaves with slight undulations that reveal purple undersides. The leaves also have undertones that transition from purple to green as they mature.



Heuchera 'Miracle'

Heuchera 'Miracle' has a consistently dense mound of chartreuse foliage. The early spring foliage has pinkish-orange centers.



Heuchera 'Pinot Noir'

Heuchera 'Pinot Noir' has light green leaves with a silver veil and dark green veins. The medium sized habit is somewhat open and gives 'Pinot Noir' a very natural aesthetic.



Heuchera 'Plum Pudding'

Heuchera 'Plum Pudding' is a medium sized cultivar with slightly ruffled, purple leaves. 'Plum Pudding' maintains its purple color all season.



Heuchera 'Rachel'

Heuchera 'Rachel' is a medium sized, bronze cultivar whose leaves have a pale purple underside. The habit started out loose but greatly improved each year of the trial.



Floral Display

In the past coral bells were generally grown for their floral display. The typical old-fashioned coral bells were usually hybrids of *H. sanguinea*, a native of the southwestern United States, whose bright red flowers are great for attracting hummingbirds. When cultivars like *H.* 'Montrose Ruby' and others with colorful foliage became available, gardeners began to appreciate foliage color more than floral display. This is a justifiable tradeoff since flowers often bloom for a short period of time while foliage can be attractive from spring through fall. Because floral display was not always an important criteria for breeders of new *Heuchera* cultivars, a hybrid with a beautiful floral display became a rare occurrence.


H. americana

In our trial we set out to determine which cultivars could be recommended for their floral display in addition to attractive foliage. We rated plants on a three-tiered system where the floral display was either outstanding, attractive, or insignificant. Plants with outstanding floral displays are ones that might be grown especially for their flowers. Attractive floral displays are nice, but they probably would not be the deciding factor when choosing a cultivar. The last category is for a floral display that is not a strong ornamental feature. These cultivars should just be thought of as foliage plants. Some of the characteristics used in this determination were flower color (does it stand out against the foliage), quantity of blooms, and sturdiness of flowering stems. For example, *Heuchera* 'Citronelle' displayed a moderate amount of blooms on sturdy flowering stems, but because the white flowers are hard to see against the yellow foliage, it was determined to be an insignificant attribute of the cultivar. The preceding chart shows the floral display category as well as other flower characteristics for each cultivar.

We also learned that some *Heuchera* are what others have called "shy bloomers". These plants can go several years with few to no flowers, but may put on an impressive display periodically. Most cultivars in our trial bloomed each year; however, the quantity of blooms was sometimes quite variable.


***H.* 'Beaujolais'** ***H.* 'Dark Chocolate'** ***H.* 'Stainless Steel'** ***H.* 'Raspberry Ice'** ***H.* 'Pinot Gris'**

Sun Tolerance

Can *Heuchera* be planted in full sun? As a general rule the answer is no, at least if you live in the mid-Atlantic. Many *Heuchera* are frequently recommended for full sun to partial shade, but when following these guidelines, mid-Atlantic gardeners are often met with disappointing results. The issue arises from regional differences in sun intensity and duration. In the Pacific Northwest, many *Heuchera* perform very well in full sun conditions, so plants developed there carry those recommendations all over the country. Mt. Cuba Center tested each cultivar in full sun growing conditions for a period of two years to determine if any selections could tolerate full sun, or at least more sun than others. At the end of our experiment, we found that very few selections could be recommended for full sun. All cultivars, except for the chartreuse ones, survived these growing conditions, but the attractiveness of their foliage was greatly diminished. In addition to the bleaching and burning that we based our ratings on, plants also exhibited stunted growth and significant color differences from their shade grown counterparts. Because our soil is well-drained but remains quite moist without any supplemental irrigation, it is doubtful that even regular watering would improve upon the results from our trial. All plants looked better when grown under shade conditions. Please see the preceding chart for our recommendations on the maximum amount of full sun exposure for each cultivar.

Foliage Transition

One of the most interesting observations made throughout our trial was how *Heuchera* change color through the seasons. Some selections do this more dramatically than others via contrasting leaf veins, or color changes in the center of a leaf while the outer edge stays the same. These color variations are generally tied to new growth, where the most colorful foliage is seen as new leaves develop during spring and fall. However, sometimes these contrasting colors can develop on mature foliage. Cultivars like 'Electra' and 'Electric Lime' develop red venation on older leaves as the temperature begins to cool in fall. Many cultivars also have dramatic whole-leaf color changes as the leaves mature each year. Generally, most *Heuchera* have darker, more dramatically colored new growth in the spring and fall with more subdued colorations during summer. In many cases, the color is attractive regardless of the season, but it's important to be aware of this possibility when designing with strict color schemes.





H. 'Delta Dawn'





H. 'Electra'





H. 'Green Spice'

Visitor Favorites

Starting in 2012, visitors were asked to pick three of their favorite plants in our trial. The goal of this program was to provide direct feedback from the consumer to the nursery industry about which plants and characteristics the gardening public found most exciting. Over 1,800 votes were collected. Guests were also asked to identify their age group and level of gardening experience. The results were very representative of the typical garden consumer with 76% of respondents over age 40, and 79% described themselves as gardeners, both amateur (54%) and professional (25 %).

The ten most popular cultivars were, in order: 'Spellbound'*, 'Citronelle'*, 'Southern Comfort'*, 'Guardian Angel', 'Green Spice', 'Tiramisu', 'Georgia Peach', 'Caramel'*, 'Root Beer', and 'Fire Chief'. Plants indicated by * were also among the top ten cultivars based on rigorous, long-term evaluation.



An interesting fact is that different types of cultivars were more popular in different seasons. During spring, people were strongly drawn to cultivars whose leaves had two or more contrasting colors like 'Tiramisu', 'Delta Dawn' and 'Green Spice'. While spring was all about contrasting colors, summer and fall were about bold, solid colors. When much of the contrasting and bright spring growth had faded, people generally chose plants whose bright bold colors stood out from the overwhelming 83 *Heuchera* cultivars. Striking selections like 'Citronelle', 'Spellbound', 'Guardian Angel' and 'Southern Comfort' became the cultivars of choice during summer and fall .

It should be noted that there are a couple of cultivars on this top-ten list that were not great performers even though they may have been attractive during a particular year or season. Visitors voted based on what they saw on a particular day, whereas our ratings reflect the performance over the entire three-year period. However, it is our hope that those breeding new cultivars will use this knowledge to improve their performance. The top one-third most popular cultivars were given the Visitor Favorite designation and can be found on the preceding chart.

Diseases

Heuchera generally have few pest and disease problems. However, some disease was observed in our trial, likely due to the incredibly large number of *Heuchera* in one location. The following are potential issues a gardener may encounter when growing coral bells.

Black Vine Weevil: Although not seen in our trial, black vine weevil is a known pest of *Heuchera*. Characteristic D-shape holes around the leaves are the best indicator of their presence. This foliar feeding by adults does not cause much damage. However, they lay their eggs in the soil at the base of the plant, and the hatching larvae chew through the crown of the plant effectively killing the top growth and providing an entry for pathogens. Beneficial nematodes can be purchased from local garden centers that will control the larval stage of this pest in spring and fall.


Japanese beetle damage

Japanese Beetles: Japanese beetles were observed during our trial and are commonly found in many gardens throughout the mid-Atlantic. While the usefulness of traps is debatable, the best method for control may be manual collection. Japanese beetle grubs feed on the roots of turf grasses, so limiting the amount of lawn may help reduce beetle populations.


Leaf spot

Leaf Spot: Fungal and bacterial leaf spot were observed on a few plants throughout the three-year trial. Certain cultivars like 'Beaujolais', 'Encore', 'Georgia Peach', 'Ginger Peach', 'Mint Julep', 'Pinot Gris', and 'Tiramisu' were more susceptible than others. However, these occurrences were likely more common due to the large number of *Heuchera* in one space. Early detection and removal of affected leaves is the best treatment. Look for black or brown spots developing on leaves in late spring/early summer. These spots can range from the size of a poppy seed to a pea depending on the specific pathogen. Leaf spot is generally not life threatening.

Powdery Mildew: Powdery mildew has been noted to affect some *Heuchera*, usually ones closely allied with *H. sanguinea*. We did note a few instances in our trial, but it was not very common and never severe enough to warrant action. Cultivars with frequent powdery mildew included: 'Creole Nights', 'Georgia Peach', 'Miracle', 'Peach Crisp', as well as *H. americana*. Fungicides or sprays comprised of milk or baking soda can be used to treat extreme cases, but they usually clear up on their own as the weather improves.

Rust: *Heuchera* rust is caused by a fungal pathogen that develops into rust-colored lesions on the bottom of the leaves. If present for long periods of time, a spot can develop on the upper surface of the leaf as well. Rust was not a problem in our trial. It typically occurs during cool weather, and warmer temperatures will kill off the fungus. Removal of affected leaves can help reduce the spread.

Slugs: Slugs are a common pest of many types of garden plants. Choosing *Heuchera* cultivars with thick or fuzzy leaves can help reduce damage seen by slugs. Common techniques for controlling extreme slug problems include slug baits and diatomaceous earth.

Stem Rot: Stem rot is caused by overly wet soil. Early symptoms include discolored leaves and an overall limp habit. We experienced losses after periods of significant rain, and some cultivars were more susceptible than others. Cultivars with losses of three of more plants due to stem rot include: 'Berry Marmalade', 'Caroline', 'Christa', 'Dale's Strain', 'Ginger Peach', 'Hearts on Fire', 'Malachite', 'Mars', 'Midnight Bayou', 'Montrose Ruby', 'Raspberry Ice', 'Rose Majesty', 'Royal Velvet', 'Shenandoah Mountain', 'Strawberry Swirl', 'Velvet Night', 'Vienna', as well as *H. longiflora*. Stem rot can be avoided by choosing vigorous cultivars and by providing well-drained soil either through amendments, raised beds or container growing. Average garden soil is usually well-suited for growing *Heuchera*.


Stem rot

Garden Culture

Heuchera are easily grown, low-mainenance shade plants. When sited properly they provide both beauty and function to the home landscape. Below are a few topics to consider when gardening with coral bells.



Exposure: *Heuchera* are best sited in partial to full shade. This translates to approximately 4 hours or less of direct sunlight. Plants with a higher sun tolerance may do well in as much as 6 hours of sunlight if given adequate moisture. Coral bells are great for use under trees where they can be shaded for most of the day. It's important to keep in mind that many of the chartreuse cultivars can bleach if not grown in full shade.

Soil Requirements: Another important consideration is how long a soil stays wet. *Heuchera* grow best in moist, well-drained soils. Prolonged wet soils can lead to rot, so it's important to plant in areas where water freely drains. Raised beds, slopes, and containers are almost always well-draining. Heavy garden soil can be amended with compost to help improve its drainage and aeration. *Heuchera* can also tolerate dry soil once established, but they generally do not grow quite as large.

Foliage Clean-Up: *Heuchera* usually have two flushes of growth each year. The first flush begins in spring. Although last year's foliage will persist through winter, its appearance can be very ratty by the following spring. It's best to remove this old foliage when the new growth is still small. If the winter was mild, there may be little damage, reducing the need for a spring cleaning. By mid-summer, the spring flush can become worn, tattered, and faded. Luckily a second flush of foliage typically begins for most coral bells in middle to late August. By concentrating clean-up efforts around this time you can minimize the amount of work needed to have beautiful, full color *Heuchera* for fall. The only other clean-up work that *Heuchera* need is deadheading spent flower stems. These are easily removed by hand or with scissors.

When to Divide: Dividing *Heuchera* is an important task that needs to be done every three to five years. Mature plants can develop rigid, almost woody stems that grow taller each year. As they increase in height, they become more vulnerable to damage and desiccation from drying winter winds. Periodically dividing and replanting *Heuchera* can prolong their life for many years.

Design: Coral bells are generally used as vibrant foliage plants. Their vast color palette means there is a *Heuchera* for almost every garden. Bright colored cultivars are great accent plants and can be used in repetition to provide continuity to a design. Coral bells can also be planted in masses to great effect. Larger groupings of a single cultivar help to amplify its colors on a bolder scale. Mass plantings also increase the visibility of the small, airy floral displays. *Heuchera* are amenable to transplanting so experimenting with different designs can be fun and easy. The best time to transplant *Heuchera* is in the early spring.



Ecological Horticulture: *Heuchera* can also provide significant environmental benefits. When planted as a dense mass, their foliage intercepts rainfall before hitting the ground, thereby reducing soil erosion and runoff. They are particularly suited for this job in dry, shady conditions where other plants often struggle. Dense plantings also reduce maintenance inputs by crowding out weeds and reducing the need to add wood-based mulches on a yearly basis. Because coral bells are mostly evergreen, their foliage provides these runoff and weed prevention capabilities for a much longer season than most other perennials.

Conclusion

After evaluating 83 cultivars and species, *Heuchera* 'Citronelle', *H. villosa* 'Bronze Wave', *H.* 'Cajun Fire', *H.* 'Color Dream', *H.* 'Steel City', *H.* 'Caramel', *H.* 'Apple Crisp', *H.* 'Frosted Violet', *H.* 'Southern Comfort', and *H.* 'Spellbound' were determined to be the best selections for the mid-Atlantic region based on their vigor, uniformity and reliability. One of the most interesting experiences of the trial was the color change of individual cultivars as the leaves mature. While most *Heuchera* are grown strictly for their foliage, we learned that several cultivars also have very attractive floral displays. The impact of the petite flowers can be amplified when coral bells are used in large masses. Questions regarding sun tolerance were also examined, and every cultivar performed best when grown in the shade. Overly wet soil was the biggest disease-causing factor in our trial, but when care is given to select vigorous cultivars and provide proper drainage, there are relatively few problems to worry about. Coral bells have exploded in popularity during recent years, and it's easy to understand why people love them so much. These low-maintenance gems are perfect for adding long-lasting color to the shade garden.

About Mt. Cuba Center

Mt. Cuba Center is a botanical garden that inspires an appreciation for the beauty and value of native plants and a commitment to protect the habitats that sustain them. Over the past 70 years the landscape at Mt. Cuba Center has been transformed from fallow cornfields into thriving, ecologically functional gardens, thanks to the initiative of the late Mr. and Mrs. Lammot du Pont Copeland.

The gardens at Mt. Cuba Center now represent a variety of habitats, from upland forests and meadows to lowland ponds. With its support of bio-diverse communities, Mt. Cuba Center serves as a model for environmentally beneficial gardening. Mt. Cuba Center also conducts original research on native plants in the Trial Garden and manages over 500 acres of natural lands. Mt. Cuba Center is open for visitation April-October and classes are offered year-round.



About Trial Garden Research

Mt. Cuba Center's Trial Garden, managed by George Coombs, is where native plants and their related cultivars are evaluated for their horticultural and ecological value. The goal of this research is to provide gardeners and the horticulture industry with information about superior plants for the mid-Atlantic region as well as highlight the important ecosystem services native plants provide. Mt. Cuba Center has been conducting trial garden research since 2002 and is currently evaluating tickseed (*Coreopsis* spp.), bee balm (*Monarda* spp.), false indigo (*Baptisia* spp.), and phlox (*Phlox* spp.).

MT. CUBA CENTER
Gardening on a higher level

3120 Barley Mill Rd.
Hockessin, DE 19707
302.239.4244
mtcubacenter.org

References

Carey, Dennis, and Tony Avent. "Ringing the Coral Bells: The Heuchera and xHeucherella Story," *Plant Delights Nursery*, http://www.plantdelights.com/Article/Heuchera-Heucherella-Coral-Bells
Hawke, R. (2003). "Plant Evaluation Notes: An Evaluation Study of Coral Bells," *Chicago Botanic Garden*, 2003, http://www.chicagobotanic.org/research/ornamental_plant_research/plant_evaluation
Heims, D., & Ware, G. *Heucheras and Heucherellas: coral bells and foamy bells.* Portland: Timber Press, 2005.
Oliver, C. G., & Oliver, *M. Heuchera, tiarella and heucherella: a gardener's guide*. London: Batsford, 2006.
Pirone, P. P. *Diseases and pests of ornamental plants.* 5th ed. New York: Wiley, 1978.
National Weather Service, http://www.nws.noaa.gov/climate/index.php?wfo=phi

©Mt. Cuba Center, 2014 All Rights Reserved