Monarda
For the Mid-Atlantic Region
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The genus *Monarda* was named for the Spanish botanist, Nicholas Monardes, who wrote the first reference book on the medicinal value of North American native plants in 1571. The medicinal properties of *Monarda* were well known to numerous Native American tribes who used the plants to cure ailments such as fever, headache, and cough. Rubbing crushed leaves on the body was also used to alleviate pain, and the common name bee balm likely came from its ability to soothe the pain associated with bee stings. Other historical uses include perfume, food seasoning, and even for protection from ghosts.

The first historical record of *Monarda* being used as a garden plant dates back to 1745 in the garden of Englishman Peter Collinson. He obtained seeds of scarlet bee balm (*M. didyma*) from Philadelphia’s famed American botanist, John Bartram, who collected the seed in Oswego, New York. It is from this location that *M. didyma* gets its other common name, Oswego tea. The natives and early settlers in the Oswego area used the leaves to flavor their drink. In fact, *Monarda* reportedly became a substitute for traditional English tea in New England after the Boston Tea Party. Another species, *M. fistulosa*, also has a tea-related common name. It is called wild bergamot because it has a similar fragrance to true bergamot (*Citrus aurantium* var. *bergamia*), which is famous for giving Earl Gray tea its distinctive flavor.

Today, scientists have named 17 different species of *Monarda*, all of which are native to North America. However, most garden plants are hybrids or selections of just two species, *Monarda didyma* and *Monarda fistulosa*. Because these two species have different colored flowers, red and lavender respectively, most hybrid cultivars available today come in shades of purple, pink, fuchsia, and bright red.

For many years, the breeding of new bee balm cultivars took place in Europe, with an emphasis on novel flower colors. Unfortunately, their performance and powdery mildew resistance in North America was largely overlooked. In the 1960s, the Canadian government started a breeding program to create new, disease-resistant cultivars with improved cold hardiness for Canada. The cultivars from this program, such as ‘Marshall’s Delight’ and Grand Marshall™ (*AChall*) are still commonly sold today. Current breeding efforts from around the world typically focus on compact, disease-resistant selections with larger flowers. We evaluated some of these new introductions in our trial, and still newer selections are continually being released.

Today, people are increasingly aware that their landscapes provide not just beauty, but also play a role in improving the environment. With the ability to support a multitude of different pollinators, *Monarda* is well positioned to capitalize on this growing trend and will continue to be a popular garden plant for years to come.
Monarda is a member of the mint family which is easily characterized by traits like square stems, opposite leaves, fragrant foliage, and a spreading habit. Monarda primarily spreads by underground stems called rhizomes. In spring, the nodes along each rhizome produce a small set of leaves that sit just on top of the ground and form a loose mat of foliage. As the weather warms, the plants grow taller, reaching several inches by late April. By mid-June, the plants are typically at their maximum blooming height and will start to flower in a few short weeks.

The first flowers open at the center of the flower head and radiate outward. Most Monarda have just one flower head at the tip of each stem; however, there are a few species that have several flower heads stacked on top of one another. A single Monarda inflorescence is a group of many individual flowers that are joined at the base of the calyx, from which the colorful petals emerge. The bracts beneath the joined calyces are often colorful too. Inflorescences can measure 2-5” inches in diameter; however, most are 2-3” wide. The larger 4-5” flowers are only found on M. didyma and its cultivars, and are usually pollinated by hummingbirds, while the smaller flowers are pollinated by bees and other insects. The entire floral display typically lasts for three weeks. Many sources indicate Monarda can bloom all summer, though we did not observe that in our evaluation. The one exception would be the annual species, Monarda citriodora.

Once pollinated, small seeds develop inside the persistent calyx and can serve as a food source for birds in late summer and fall. As an herbaceous perennial, the top growth dies back at the end of each season. However, the rhizomes may continue to grow and any basal leaves that are produced at this time will likely persist through the winter months.
Mt. Cuba Center evaluated the performance of 40 selections of bee balm over three years to assess their overall garden performance in the mid-Atlantic region. Particular attention was given to habit, powdery mildew resistance, leaf retention, and flower coverage. Although there is no perfect bee balm that excels in all of these areas, each of the following top performers has strengths in many categories and would make a wonderful addition to the garden.

**Monarda fistulosa ‘Claire Grace’ ★★★★★**

*Monarda fistulosa* ‘Claire Grace’ ranked highly in our trial due to its sturdy, upright habit and prolific floral display. The impressive flower coverage lasts for three straight weeks at nearly 100%. ‘Claire Grace’ is a naturally occurring selection of *Monarda fistulosa*. It was found by Barb and Michael Bridges, owners of the now-closed Southern Perennials and Herbs, and named for their daughter. Compared to *M. fistulosa*, ‘Claire Grace’ has a sturdier habit, darker purple flowers, better resistance to powdery mildew, and more attractive, glossy green foliage.

**Monarda ‘Dark Ponticum’ ★★★★★**

*Monarda* ‘Dark Ponticum’ stood out in the trial for its incredibly healthy-looking foliage. The dark, bluish green leaves give the plant a very lush and attractive appearance throughout the entire season. Powdery mildew can occur on ‘Dark Ponticum’, but it does not affect the actual health of the foliage. This is especially impressive in late August and September when bee balm foliage is generally at its worst. ‘Dark Ponticum’ also excels with a floral display that blooms with near 100% flower coverage for three straight weeks. The vast multitude of violet-purple flowers attracts many bees too. ‘Dark Ponticum’ outperforms a nearly identical cultivar called ‘Blastrumpf’ (Blue Stocking) which is much more prone to powdery mildew.
**Monarda ‘Violet Queen’ ★★★★★**

*Monarda* ‘Violet Queen’ is a prolific bloomer and, at least anecdotally, a favorite among the bees. The flower color is similar, though slightly lighter than ‘Dark Ponticum’. ‘Violet Queen’ has short, silvery leaf hairs which give the leaves a dull green appearance comparable to *M. fistulosa*. While the foliage of ‘Violet Queen’ and *M. fistulosa* does appear similar, they differ drastically with regard to disease resistance. ‘Violet Queen’ displayed excellent powdery mildew resistance, with only the faintest infections observed over the three-year period, while *M. fistulosa* was frequently plagued with disease.

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**Monarda ‘AChall’ (Grand Marshall™) ★★★★**

*Monarda* ‘AChall’ is one of the cultivars developed through the Canadian government’s breeding program and is sold under the trade name Grand Marshall™. Grand Marshall™ has gorgeous, deep red-purple flowers, a compact habit (28” tall), and excellent resistance to powdery mildew. What really sets Grand Marshall™ apart from other compact cultivars is that its growth habit is still *Monarda*-like, growing in a uniform mass that spreads slowly outward. Many of the newest compact selections are dwarfed to the point of looking artificial and out of place in the landscape. Grand Marshall™ has a habit that better lends itself to blending with its neighbors in an attractive and natural way.
**Monarda ‘Judith’s Fancy Fuchsia’, ‘Colrain Red’, ‘Raspberry Wine’ ★★★★**

*Monarda* ‘Judith’s Fancy Fuchsia’, ‘Colrain Red’, and ‘Raspberry Wine’ are all very similar in habit, flower color, and performance. The 44” to 48” tall plants bloom in early July with an abundance of large, purplish red flowers. Floral production is identical among these three cultivars, each producing 80% flower coverage at peak bloom. Of the three, ‘Judith’s Fancy Fuchsia’ slightly edges out the other two thanks to its better disease resistance. It received a powdery mildew resistance rating of excellent, while ‘Colrain Red’ and ‘Raspberry Wine’ both rated as fair. Taking all things into account, these three cultivars are each highly recommended and could be used interchangeably in the landscape.

**Monarda ‘Purple Rooster’ ★★★★★**

*Monarda* ‘Purple Rooster’ has the darkest, truest purple flowers of any cultivar in our trial. Its upright, rigid stems create a strongly vertical aesthetic while the dull green leaves have a rough, sand-papery texture. Because of these traits, ‘Purple Rooster’ does have a slightly different look compared to most of the other bee balms. However, the most impressive feature of ‘Purple Rooster’ is that powdery mildew was never observed on its foliage. This cultivar was selected by The Flower Factory in Stoughton, Wisconsin and named by the owners David and Nancy Nedveck.
**Monarda ‘On Parade’ ★★★★**

*Monarda ‘On Parade’* performs very similarly to the trio of purplish-red cultivars, ‘Judith’s Fancy Fuchsia’, ‘Colrain Red’, and ‘Rapsberry Wine’. The foliage grows approximately 4’ tall and displays fair resistance to powdery mildew, with the worst infections typically occurring during flowering. ‘On Parade’ stands out from the other three cultivars due to its brilliant, orchid purple flowers. With peak flower coverage at 90%, ‘On Parade’ derives much of its success in the trial from its impressive and eye-catching floral display.

**Monarda ‘Gardenview Scarlet’ ★★★★**

*Monarda ‘Gardenview Scarlet’* is the only true red-flowering cultivar to rate among the top performers. It has large, 4” wide, *didyma*-like flowers that are great for attracting hummingbirds. ‘Gardenview Scarlet’ shares this and many other traits in common with *Monarda didyma* ‘Jacob Cline’. However at 36” tall, ‘Gardenview Scarlet’ is approximately 1’ shorter, and in our trial, exhibited more consistent powdery mildew resistance.
Additional Noteworthy Selections

Below are several cultivars that scored slightly lower than the top performers but could still be recommended.

Compact Cultivars

Many of the latest cultivars of bee balm are compact selections bred for shorter habits that enhance their attractiveness on the retail bench. Throughout our trial we found many of these cultivars to be poor performers, displaying a shorter than average bloom time and poor vigor. Powdery mildew resistance has been a breeding goal in all new cultivars, and in many cases these newer dwarf hybrids do show improved powdery mildew resistance. However, their overall garden performance makes this group hard to recommend, with the exception of *Monarda* ‘AChall’ (Grand Marshall™) which was the only compact selection to rate among the top performers. Its spreading habit is noteworthy as it is more consistent with the taller cultivars. Four other compact selections (approximately 2’ tall or less) with passable performances include: *Monarda* ‘Acpetdel’ (Petite Delight™), ‘ACrade’ (Grand Parade™), ‘Cranberry Lace’, and ‘Pink Lace’.
Several species of *Monarda* were included in our trial that are not widely used in horticulture. The purpose of evaluating these plants was to determine their merits in conjunction with how they might best be used in a garden or landscape. We looked at three perennial and one annual species and found that each has promising attributes that showcase great potential. Excellent powdery mildew resistance is one such trait shared among these species. However, there are also significant negative characteristics that prevent them from being highly recommended. With greater research and selection, improved forms of these species may become worthy additions to the garden.

### *Monarda bradburiana* (eastern bee balm)

**Pros**
- Excellent powdery mildew resistance
- Compact habit (2’ tall)
- Early bloom time
- Slow-spreading habit

**Cons**
- Floppy stems

**Future Research**
- Select sturdier forms

### *Monarda punctata* (dotted bee balm)

**Pros**
- Excellent powdery mildew resistance
- Impressive flower production/longevity
- Great pollinator plant (especially wasp species)

**Cons**
- Poor late season appearance (floppy, yellowing)
- May not be reliably perennial

**Future Research**
- Select forms for improved bract color
- Select forms for improved vigor/habit

### *Monarda citriodora* (lemon bergamot)

**Pros**
- Excellent powdery mildew resistance
- Impressive floral display

**Cons**
- Floppy habit
- Annual life cycle

**Future Research**
- Select forms for improved flower/bract color
- Select forms for improved vigor/habit
- Select forms for reliable self-sowing

### *Monarda clinopodia* (basil bee balm)

**Pros**
- Excellent powdery mildew resistance

**Cons**
- Inferior flower coverage
- Aging flowers turn brown quickly

**Future Research**
- Use for breeding better disease resistance
Where to Plant

Monarda is best planted in a consistently moist soil that receives full sun to partial shade. In nature Monarda fistulosa is often found in sunnier and drier habitats than M. didyma. However, it is not recommended to plant even M. fistulosa in dry soils as any additional stress will easily lead to powdery mildew and defoliation. Most bee balms available at garden centers are hybrids between these two species and typically prefer full sun to partial shade and moist, well-drained soil.

Spread

Bee balm is sometimes described as aggressive, or even thuggish in the garden. Highly fertile soils will almost certainly lead to rambunctious Monarda, but competition with neighboring plants can help keep them in check (see Design on pg 11). Additionally, not all bee balms are equal in their rate of spread. Monarda didyma is the most aggressive species while others like Monarda fistulosa and Monarda bradburiana are moderate and slow spreaders, respectively. Since it is difficult to determine how a hybrid cultivar might perform, we have compiled our observations about the rate of spread on each cultivar tested by detailing their final width after three years in the garden (see pg 13). Bee balm typically spreads via underground stems called rhizomes during the cool weather of early spring and fall. Therefore, the best time to intervene with an expanding bee balm is spring, just before the stems start to elongate. A shovel can be used to sever the perimeter and prevent expansion. Because Monarda are shallow rooted plants, they can easily be pulled once severed from the main part of the mass.

Division

Depending on how fast a bee balm spreads, it may need to be divided every 3-5 years. Without division, the center of the mass will start to die out, creating a donut-like shape. Monarda can be rejuvenated by replacing the original plant with a sizeable mass from the healthy, actively growing portion. The best time for division is late summer or early fall.
Rejuvenation
If powdery mildew does become unsightly, some experts recommend cutting the plants back to promote a new flush of clean foliage. We tested different iterations of this philosophy each year and received mixed results. Cutting the plants back to the ground after they finished blooming did not promote much new growth. However, this method was carried out during a particularly dry period which may have reduced their potential to reflush. We also tried simply deadheading spent flowers, but this did not have a significant impact compared to the control. Our best results, although mild, were obtained from an intermediate approach where we cut the plants back by about half once they finished flowering. Although this did seem to promote an increase in new growth across most cultivars, it was not necessarily enough to make an appreciable difference. Unfortunately, this technique does little to help the plants with little-to-no lower foliage as these leafless stems are very resistant to develop new growth after pruning. If bothersome, these bare stems are best cut back to ground level.

Design
Monarda are wonderful companion plants for the perennial border, but some popular cultivars can be prone to disease and defoliation. Selecting disease-resistant cultivars, like many of the top performers in our trial, should be the first tactic used to avoid this problem. However, other design choices can also help– like choosing planting partners that will obscure or distract attention from any late season untidiness. Asters and goldenrods are excellent options for this strategy.

Because these plants do tend to spread, it is important to plant them with strong, vigorous neighbors that can stand up to some encroachment. Tall perennials and grasses are excellent choices to maintain their ground against any bee balm. While their tendency to spread may seem like a negative attribute, it can also be their most useful from a design standpoint. Bee balm will truly excel in areas where a lot of space needs to be covered or in naturalistic style plantings with other vigorous plants that can match their aggression equally.
Powdery Mildew

Powdery mildew is a common disease of bee balm and many other garden plants and develops as a whitish gray fuzz or haze on leaves and stems. This fungus is ubiquitous in the environment and requires only a susceptible host and proper weather conditions to develop. Powdery mildew usually first appears when the days are warm and the nights are cool. The cool nights provide the high humidity that favors spore germination (initiation of new infections) and warm days provide the low humidity that enables spore dispersal (spreading of existing infections).

In our evaluation, the first signs of infection typically appeared in July as the plants started to flower. Flowering requires a significant amount of energy and resources, and this stress can make plants vulnerable to infection. It is therefore important to prevent/reduce infections by limiting the amount of stress a plant experiences. For *Monarda*, this might be accomplished by providing adequate water during its flowering period. Dividing older clumps every few years may also help to reinvigorate tired and stress-prone plants.
Plant Characteristics and Performance Summary Ratings

<table>
<thead>
<tr>
<th>Monarda</th>
<th>Rating</th>
<th>Avg. Height</th>
<th>Width After 3 Years</th>
<th>Flower Color</th>
<th>Bloom Time</th>
<th>Peak Flower Coverage</th>
<th>Powdery Mildew Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. austroappalachiana 'Snowbird'</td>
<td>2.8</td>
<td>**</td>
<td>16&quot;</td>
<td>26&quot;</td>
<td>white</td>
<td>mid-June</td>
<td>80%</td>
</tr>
<tr>
<td>M. bradburiana</td>
<td>3.6</td>
<td>***</td>
<td>24&quot;</td>
<td>33&quot;</td>
<td>pale pink</td>
<td>early June</td>
<td>90%</td>
</tr>
<tr>
<td>M. citriodora</td>
<td>3.7</td>
<td>****</td>
<td>26&quot;</td>
<td>replanted yearly</td>
<td>light purple</td>
<td>June - July</td>
<td>100%</td>
</tr>
<tr>
<td>M. citriodora 'Bergamo'</td>
<td>3.3</td>
<td>**</td>
<td>20&quot;</td>
<td>replanted yearly</td>
<td>purple</td>
<td>June - July</td>
<td>100%</td>
</tr>
<tr>
<td>M. clinopodia</td>
<td>3.4</td>
<td>**</td>
<td>36&quot;</td>
<td>46&quot;</td>
<td>white</td>
<td>mid-July</td>
<td>60%</td>
</tr>
<tr>
<td>M. didyma</td>
<td>1.7</td>
<td>**</td>
<td>38&quot;</td>
<td>42&quot;</td>
<td>red</td>
<td>late June</td>
<td>10%</td>
</tr>
<tr>
<td>M. didyma 'Jacob Cline'</td>
<td>3.7</td>
<td>**</td>
<td>50&quot;</td>
<td>40&quot;</td>
<td>red</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. fistulosa</td>
<td>2.4</td>
<td>**</td>
<td>50&quot;</td>
<td>40&quot;</td>
<td>pale purple</td>
<td>mid-July</td>
<td>100%</td>
</tr>
<tr>
<td>M. fistulosa 'Claire Grace'</td>
<td>4.5</td>
<td>****</td>
<td>35&quot;</td>
<td>38&quot;</td>
<td>light purple</td>
<td>early July</td>
<td>100%</td>
</tr>
<tr>
<td>M. punctata</td>
<td>4.0</td>
<td>****</td>
<td>36&quot;</td>
<td>25&quot;</td>
<td>yellow, white/pink bracts</td>
<td>July</td>
<td>100%</td>
</tr>
<tr>
<td>M. 'AChall' (Grand Marshall™)</td>
<td>4.2</td>
<td>****</td>
<td>28&quot;</td>
<td>36&quot;</td>
<td>reddish purple</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Acpedel' (Petite Delight™)</td>
<td>3.4</td>
<td>**</td>
<td>12&quot;</td>
<td>19&quot;</td>
<td>pale purple</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'A'Crade' (Grand Parade™)</td>
<td>3.5</td>
<td>***</td>
<td>14&quot;</td>
<td>39&quot;</td>
<td>light purple</td>
<td>late June</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Balbalmurp' (Balmy Purple)</td>
<td>2.7</td>
<td>**</td>
<td>12&quot;</td>
<td>15&quot;</td>
<td>dark purple</td>
<td>late June</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Blausstrupm' (Blue Stocking)</td>
<td>3.7</td>
<td>**</td>
<td>40&quot;</td>
<td>34&quot;</td>
<td>purple</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Bryan Thompson'</td>
<td>3.5</td>
<td>**</td>
<td>32&quot;</td>
<td>39&quot;</td>
<td>white</td>
<td>mid-July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Cambidge Scarlet'</td>
<td>3.7</td>
<td>**</td>
<td>34&quot;</td>
<td>42&quot;</td>
<td>red</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Colrain Red'</td>
<td>4.0</td>
<td>****</td>
<td>48&quot;</td>
<td>54&quot;</td>
<td>purplish red</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Coral Reef'</td>
<td>2.9</td>
<td>**</td>
<td>28&quot;</td>
<td>20&quot;</td>
<td>pink</td>
<td>early July</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Cranberry Lace'</td>
<td>3.2</td>
<td>**</td>
<td>14&quot;</td>
<td>20&quot;</td>
<td>dark pink</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Dark Ponticum'</td>
<td>4.5</td>
<td>****</td>
<td>40&quot;</td>
<td>37&quot;</td>
<td>purple</td>
<td>early July</td>
<td>90%</td>
</tr>
<tr>
<td>M. 'Fireball'</td>
<td>3.2</td>
<td>**</td>
<td>38&quot;</td>
<td>36&quot;</td>
<td>purplish red</td>
<td>early July</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Gardenview Scarlet'</td>
<td>4.0</td>
<td>****</td>
<td>36&quot;</td>
<td>39&quot;</td>
<td>red</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Judith's Fancy Fuchsia'</td>
<td>4.1</td>
<td>****</td>
<td>44&quot;</td>
<td>49&quot;</td>
<td>purplish red</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Mahogany'</td>
<td>3.0</td>
<td>**</td>
<td>26&quot;</td>
<td>45&quot;</td>
<td>reddish purple</td>
<td>early July</td>
<td>40%</td>
</tr>
<tr>
<td>M. 'Mardell Delight'</td>
<td>2.7</td>
<td>**</td>
<td>32&quot;</td>
<td>40&quot;</td>
<td>pink</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'On Parade'</td>
<td>4.1</td>
<td>****</td>
<td>48&quot;</td>
<td>37&quot;</td>
<td>orchid purple</td>
<td>early July</td>
<td>90%</td>
</tr>
<tr>
<td>M. 'Pardon My Pink'</td>
<td>3.1</td>
<td>**</td>
<td>14&quot;</td>
<td>20&quot;</td>
<td>pink</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Pardon My Purple'</td>
<td>2.6</td>
<td>**</td>
<td>14&quot;</td>
<td>20&quot;</td>
<td>light purple</td>
<td>late June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Peter's Purple'</td>
<td>3.7</td>
<td>**</td>
<td>54&quot;</td>
<td>24&quot;</td>
<td>light purple</td>
<td>early July</td>
<td>100%</td>
</tr>
<tr>
<td>M. 'Petite Wonder'</td>
<td>2.7</td>
<td>**</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>light pink</td>
<td>early July</td>
<td>90%</td>
</tr>
<tr>
<td>M. 'Pink Lace'</td>
<td>3.2</td>
<td>**</td>
<td>26&quot;</td>
<td>39&quot;</td>
<td>dark pink</td>
<td>late June</td>
<td>90%</td>
</tr>
<tr>
<td>M. 'Pink Supreme'</td>
<td>3.7</td>
<td>**</td>
<td>30&quot;</td>
<td>40&quot;</td>
<td>hot pink</td>
<td>mid-July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Prairie Gypsy'</td>
<td>3.8</td>
<td>****</td>
<td>40&quot;</td>
<td>46&quot;</td>
<td>purple</td>
<td>mid-June</td>
<td>100%</td>
</tr>
<tr>
<td>M. 'Purple Mildew Resistant'</td>
<td>3.8</td>
<td>****</td>
<td>34&quot;</td>
<td>51&quot;</td>
<td>light purple</td>
<td>mid-June</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Purple Rooster'</td>
<td>4.1</td>
<td>****</td>
<td>44&quot;</td>
<td>42&quot;</td>
<td>dark purple</td>
<td>late June</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Raspberry Wine'</td>
<td>4.0</td>
<td>****</td>
<td>44&quot;</td>
<td>45&quot;</td>
<td>purplish red</td>
<td>mid-July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Scorpion'</td>
<td>1.9</td>
<td>**</td>
<td>38&quot;</td>
<td>22&quot;</td>
<td>purple</td>
<td>early July</td>
<td>70%</td>
</tr>
<tr>
<td>M. 'Snow White'</td>
<td>3.1</td>
<td>**</td>
<td>34&quot;</td>
<td>25&quot;</td>
<td>white</td>
<td>early July</td>
<td>80%</td>
</tr>
<tr>
<td>M. 'Violet Queen'</td>
<td>4.4</td>
<td>****</td>
<td>48&quot;</td>
<td>37&quot;</td>
<td>purple</td>
<td>early July</td>
<td>100%</td>
</tr>
</tbody>
</table>

Rating Key: 5=excellent, 4=good, 3=fair, 2=poor, 1=very poor
Plants in bold are the top-performing selections.

Visit mtcubacenter.org/research/trial-garden for more detailed information about each plant.

About the Monarda Trial

This evaluation took place at Mt. Cuba Center, located near Wilmington, DE (USDA Hardiness Zone 7a/6b). Forty taxa representing seven species were evaluated for a three-year period (2014-2016). Plants were evaluated to assess their horticultural attributes: habit, vigor, floral display, and disease resistance. Four plants of each taxon were spaced linearly on 2’ centers. They were grown in full sun in a soil best described as clay-loam with a pH near 6.5. Each species or cultivar was 'replicated' yearly for more detailed information about each plant.

Monarda for the Mid-Atlantic Region

www.mtcubacenter.org
Pollinator Attraction

In 2016 Mt. Cuba Center enlisted a team of trained volunteers to conduct a citizen science project regarding visitation of hummingbirds, moths, and butterflies in the *Monarda* trial. Their goal was to systematically observe and record the cultivars that were most frequently visited by these pollinators. Below is a listing of the five most-visited selections by hummingbirds and moths/butterflies.

### Hummingbird
1. *M. didyma* ‘Jacob Cline’ (273)
2. *M*. ‘Gardenview Scarlet’ (39)
4. *M. didyma* (22)
5. *M*. ‘Raspberry Wine’ (22)

### Moth/Butterfly
1. *M. fistulosa* ‘Claire Grace’ (138)
3. *M*. ‘Violet Queen’ (101)
4. *M*. ‘Peter’s Purple’ (67)
5. *M*. ‘Colrain Red’ (61)

One of the first things we learned from this data is that hummingbirds visit large-flowered, red cultivars almost to the exclusion of everything else. This is most likely due to the fact that hummingbirds require a larger flower size in order to access the nectar. Despite the floral similarities among the hummingbird-visited selections, ‘Jacob Cline’ was much more favored than any other cultivar. Due to the observational nature of this project it is hard to pinpoint an exact cause, but one possible explanation may be that ‘Jacob Cline’ is the tallest of these cultivars and therefore may be easier for the hummingbirds to visit.

Just as hummingbirds favored a certain type of flower, so too did moths and butterflies. They were most frequently observed visiting selections that produced the largest abundance of 2-3” wide flowers. While Mt. Cuba Center continues to study the complexities of whether cultivars have the same ecological value as the native species from which they are derived, this result does demonstrate that there are horticulturally desirable characteristics of cultivars (i.e. improved flower production and longer bloom times) that can have a positive impact on ecological function. *Monarda fistulosa* ‘Claire Grace’, for example, is a top performer horticulturally as well as a favorite among moths and butterflies.

An important caveat to consider with any trial like this is that in a garden with fewer *Monarda* options, the lower ranked cultivars might perform equally as well. In fact, it would be very interesting to repeat the experiment without any of the most-visited cultivars and see if the abundance of pollinators would decrease or if the same number of pollinators would simply visit other selections of *Monarda*.

Although bees and wasps were not included in our citizen science evaluation, they do represent a large group of insects that are supported by the pollen and nectar produced by *Monarda* flowers. In fact, Mt. Cuba Center is currently researching how differences in floral size, shape, nectar quantity, and nectar quality affect pollinator visitation. While this work is still in progress, it is already well known that *Monarda* are able to support an incredible number of bee and wasp species.
Many species of insects visit *Monarda* flowers, but not all of these species are effective pollinators. Some insects, like short-tongued bees, are unable to access the nectar at the base of the long, narrow floral tube. Instead, these bees cut a hole at the base of the flower and simply drink the nectar from its source, completely bypassing the flower’s reproductive parts necessary for pollination. While this may seem like cheating, the nectar robbing strategy does allow *Monarda* to support a much broader diversity of insects.

**Wildlife Supported**

**Bees/Wasps**
- Bumble Bee
- Cuckoo Bee
- Honey Bee
- Leaf Cutter Bee
- Long-Horned Bee
- Mason Bee
- Mining Bee
- Paper Wasp
- Polyester Bee
- Sphex Wasp
- Sweat Bee
- Yellow-faced Bee
- Weevil Wasp

**Moths/Butterflies**
- Black Swallowtail
- Cabbage White
- Clearwing Moth
- Common Buckeye
- Eastern Tiger Swallowtail
- Fritillary
- Gray Hairstreak
- Monarch
- Pipevine Swallowtail
- Red Admiral
- Silver-spotted Skipper
- Sphinx Moth
- Spicebush Swallowtail
- Sulphurs

**Birds**
- Catbird
- Goldfinch
- Ruby-throated Hummingbird
- Sparrow
Conclusion

Over a period of three years (2014-2016) Mt. Cuba Center evaluated the garden merits and ecological value of 40 different selections of *Monarda*, including seven species native to the eastern United States as well as their hybrids. The plants were evaluated for floral display, powdery mildew resistance, habit, and vigor. The ten cultivars selected as top performers are: *M. fistulosa* ‘Claire Grace’, *M. ‘Dark Ponticum’, M. ‘Violet Queen’, M. ‘AChall’ (Grand Marshall™), *M. Judith’s Fancy Fuchsia’, M. ‘Colrain Red’, M. ‘Raspberry Wine’, M. ‘Purple Rooster’, M. ‘On Parade’, and M. ‘Gardenview Scarlet’. While there is no bee balm that excels in all measures of the evaluation, these ten cultivars represent the best selections for the mid-Atlantic region. In addition to unmistakable beauty, bee balms provide pollen and nectar for numerous types of pollinators, including bees, wasps, moths, butterflies, and hummingbirds. In fact, there are few plants as easy to grow that provide such immense rewards to gardeners and wildlife alike.

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 biodiverse 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, evaluates native plants and their related cultivars 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 conducted trial garden research since 2002, including previously completed evaluations of false indigo, coreopsis, heuchera, coneflowers, and asters.

References


Front Cover: *Monarda ‘Judith’s Fancy Fuchsia’* ©Mt. Cuba Center, 2016. All Rights Reserved.