



MT. CUBA
CENTER

RESEARCH
REPORT

Carex

FOR THE MID-ATLANTIC REGION

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Carex crinita (left), *Carex stricta* (right), and *Carex pensylvanica* (front)



CAREX FOR THE MID-ATLANTIC REGION

CAREX IS A FASCINATING GENUS OF GRASS-LIKE PERENNIALS that are found in nearly all corners of the planet. Eastern North America alone hosts hundreds of species, although relatively few of these are available commercially. The diversity of *Carex* matches the wide spectrum of habitats in which they grow, from shaded wetlands to coastal sand dunes and almost everything in between. In the garden, some *Carex* species are surprisingly adaptable to conditions outside of their typical wild preferences.

The genus *Carex* belongs to the Cyperaceae plant family. Members of this family are commonly referred to as sedges. Although sedges may appear similar to each other and to other plant families such as the Poaceae (grasses), *Carex* have specific anatomical features that set them apart.

***Carex* offer beauty, functionality, and ecological value to landscapes.**

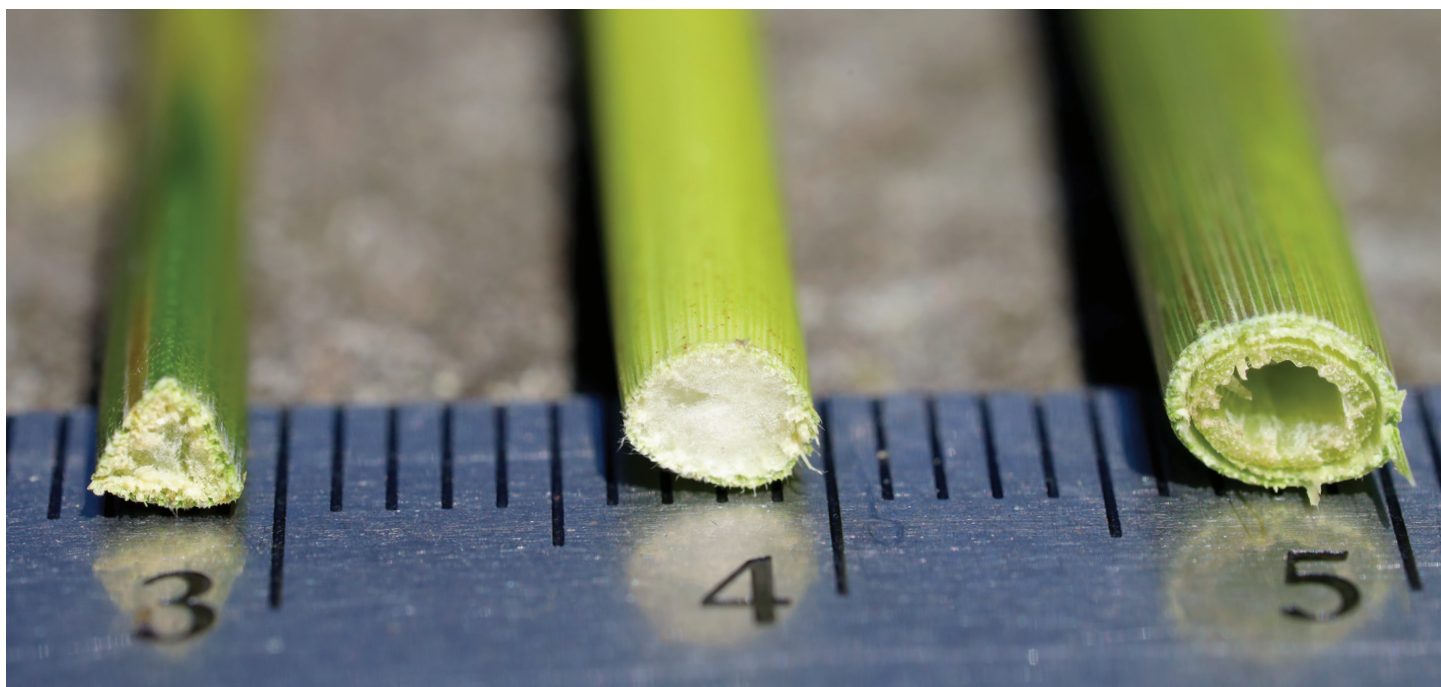
Carex are growing in popularity in horticulture thanks to their beauty, utility, and minimal maintenance requirements. *Carex* are often planted *en masse* to cover ground, stabilize soil, and suppress weeds. However, some species are so striking that they can be used as individual specimens and accents. Some members of this genus even have the potential to replace turfgrass lawns and are tolerant of regular mowing. In a typical cultivated landscape, *Carex* are low maintenance, requiring a late winter or early spring cutback, but many species thrive even without this level of care. *Carex* are more than just beautiful and useful garden plants. They contribute valuable ecosystem services both in cultivation and in the wild, including providing food and shelter for wildlife.

This trial evaluated 70 different types of *Carex*: 65 species and five cultivars. Commercially available types were included, as well as several locally native species not currently available from nurseries. Each was grown in average garden soils in both sun and shade to test their adaptability in the mid-Atlantic region.

WHAT MAKES A CAREX A CAREX?

Carex are grass-like perennials in the Cyperaceae family that, along with several other closely related genera, are collectively referred to as sedges. Simply put, all *Carex* are sedges but not all sedges are *Carex*. Sedges can resemble other families of grass-like plants such as the Poaceae (grasses) and Juncaceae (rushes). The familiar rhyme “Sedges have edges, rushes are round, grasses are hollow, what have you found?” is easy to remember and illustrates some of the most basic differences between these three distinct families.

Once a plant is determined to be a sedge, the real identification work begins. Botanists have used details of foliage, stems, flowers, and fruits to organize the large, diverse *Carex* genus into smaller groups referred to as sections. Close examination will help determine the section, a useful first step in the sometimes-challenging task of *Carex* identification.



SEDGES

Sedges have Edges

(Cyperaceae)

Sedge stems are triangular, with three edges, and are solid when cross-sectioned.

RUSHES

Rushes are Round

(Juncaceae)

Rushes, or *Juncus*, have round stems that are solid and filled with a spongy pith.

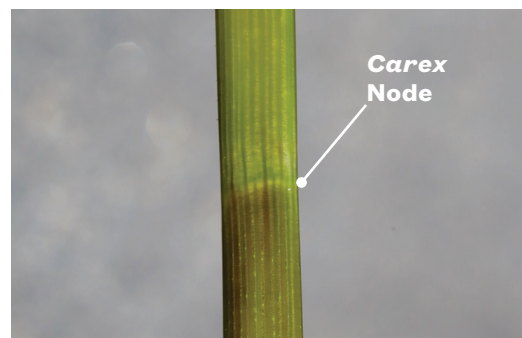
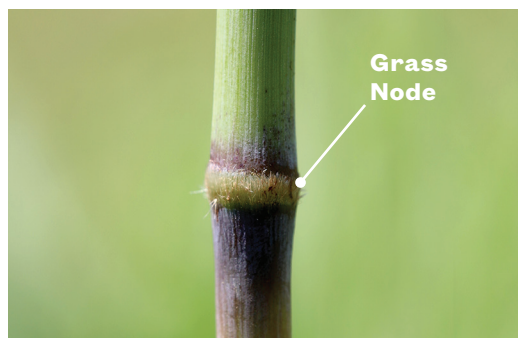
GRASSES

Grasses are Hollow

(Poaceae)

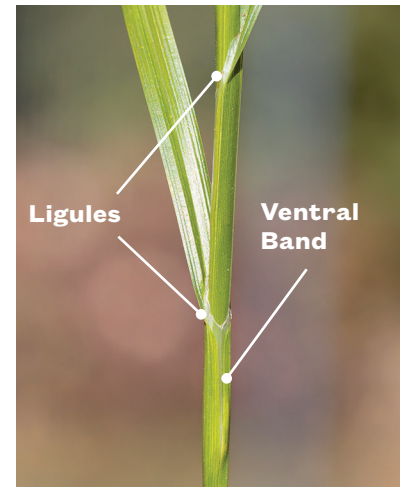
Grass stems are hollow, in contrast to the solid stems of sedges and rushes.

Another version of the rhyme finishes, “grasses have joints (or nodes) from their tips to the ground,” which highlights a distinguishing feature of grasses, conspicuously swollen joints or nodes.





Carex plantaginea (plantain-leaf sedge)



Carex muskingumensis (Muskingum sedge) stem. Photo: Paul Wilson

CAREX STEMS AND FOLIAGE

The leaf blades of sedges in the trial display many shades of green and have textures ranging from fine to coarse. Some sedges, such as *Carex plantaginea* (plantain-leaf sedge), have characteristic foliage and can be identified easily by this distinctive trait alone. In other cases, details such as ventral bands and ligules provide useful clues to the identity of the plant. Ventral bands, found on the opposite side of the stem from the leaf blades, exhibit varied patterns and colors depending on the species. The ligule is a membrane-like structure of the leaf blade and sheath that clasps the stem of the sedge.

Many *Carex* in this evaluation provide visual interest year-round by retaining semi-evergreen foliage throughout the winter. Semi-evergreen *Carex* can be cut back in late winter or early spring although this is not required for all species. In contrast, one-fifth of the trialed *Carex* are deciduous, meaning that they are completely dormant during the winter months and produce a flush of new foliage each spring. Maintenance for deciduous *Carex* consists of a single cutback of dead foliage in late winter.

CAREX UNDERGROUND

Carex have two patterns of growth: clumping or spreading. Most of the trialed *Carex* are categorized as clump-forming, meaning that growth radiates from a central point and does not form an ever-increasing mat. Clumping sedges are well suited for smaller gardens as they rarely exceed the bounds of their intended spacing.

Seven of the 70 *Carex* in the trial spread via underground stems known as rhizomes. Some species including *Carex pensylvanica* (Pennsylvania sedge) and *Carex woodii* (Wood's sedge) spread relatively slowly and present little competition to neighboring plants. Other species such as *Carex emoryi* (Emory's sedge) and *Carex trichocarpa* (hairy-fruited sedge) have the potential to spread rapidly in ideal conditions. The ability to cover ground and stabilize soils could be useful in the right situation but may make them unsuitable for small home landscapes.



Clumping habit of *Carex haydenii* (Hayden's sedge). Photo: Paul Wilson



Spreading habit of *Carex trichocarpa* (hairy-fruited sedge). Photo: Paul Wilson

CAREX FLOWERS

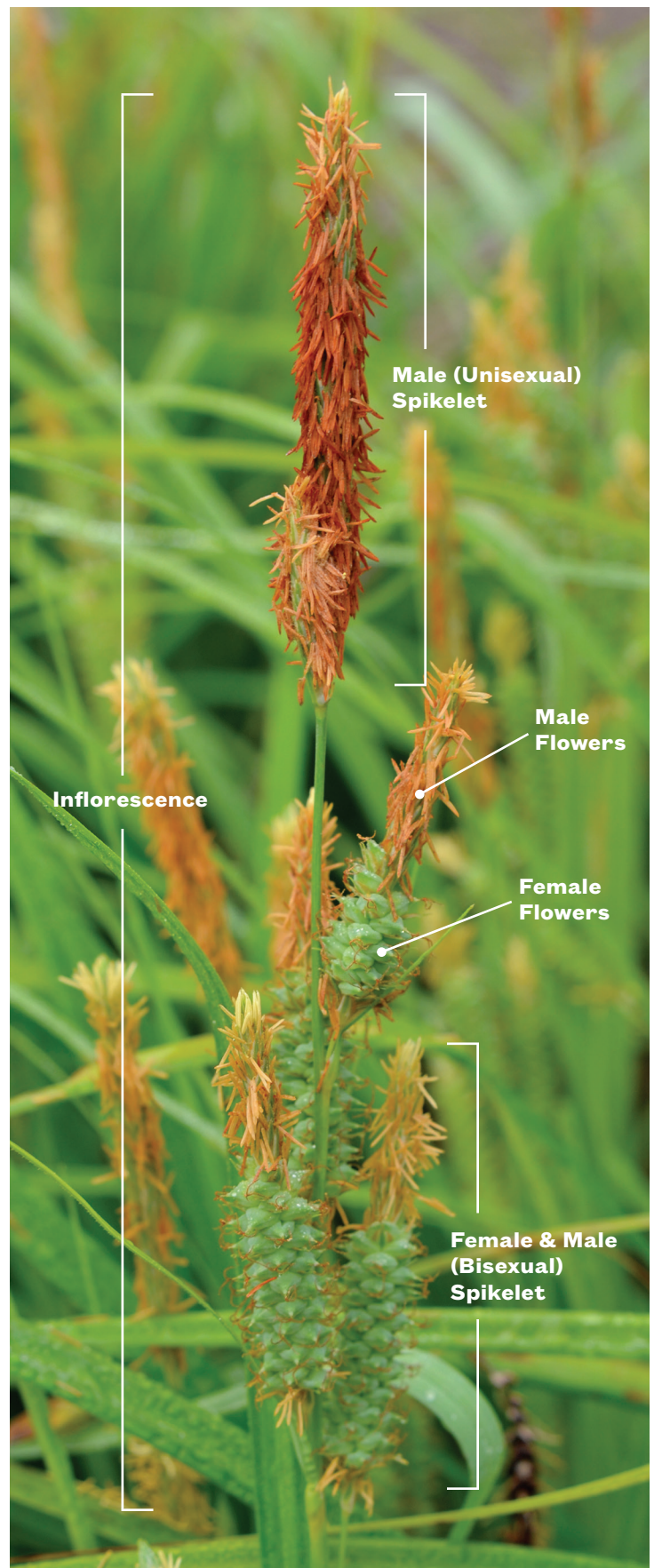
Carex flowers range from nondescript to truly spectacular. In addition to their ornamental value, the arrangement and anatomical features of *Carex* flowers are a useful identifying feature and provide important insight into the biology of this genus. The individual flowers of *Carex* are unisexual, either male or female. This is nearly unique within the world of Cyperaceae and if unisexual flowers are present, the sedge in question is most likely a *Carex*. Most *Carex* species are wind pollinated. Copious amounts of pollen are produced by the anthers of male flowers, and that pollen must contact the stigmatic surface of female flowers for pollination to occur. Male and female flowers are usually found on the same plant in clusters on the flowering stems known as spikelets. Their number and positioning on the plant as well as the composition of male and female flowers within each spikelet are helpful diagnostic features.



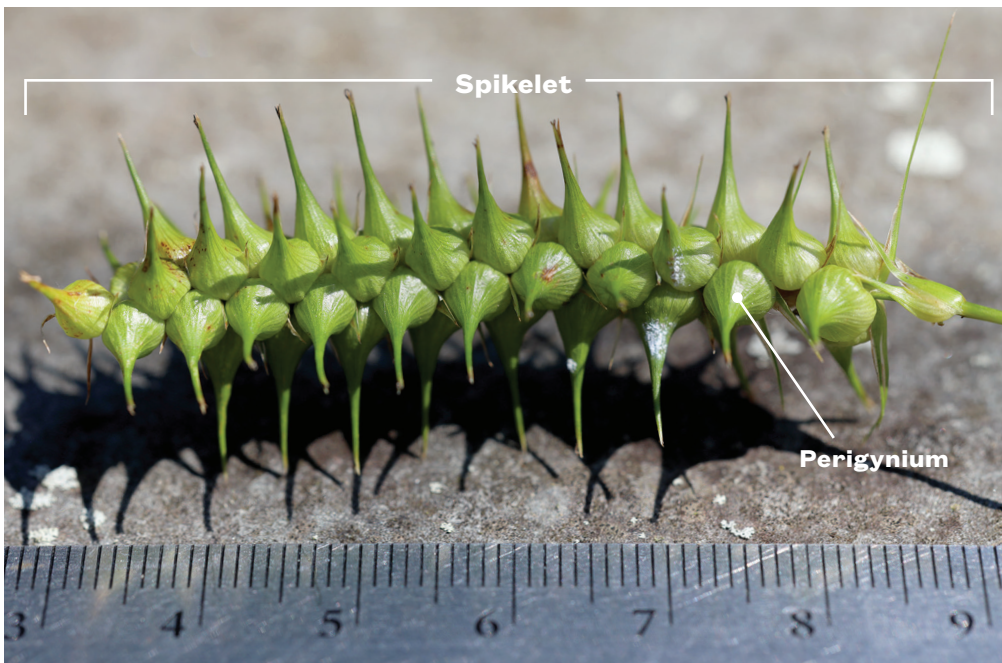
Carex typhina (cattail sedge) flowers



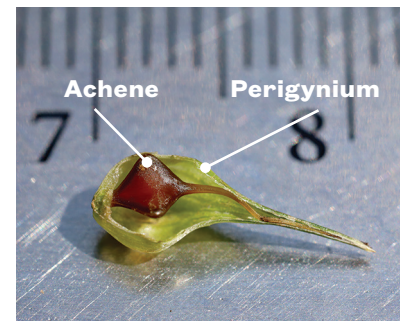
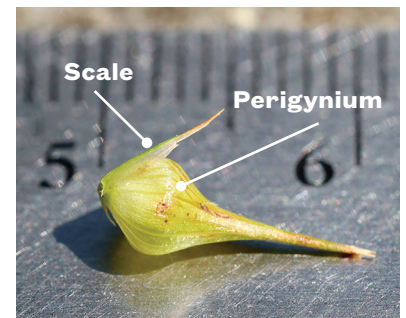
Carex barrattii (Barratt's sedge) flowers



Carex joorii (Joor's sedge) flowers



Carex gigantea (giant sedge) fruit



CAREX FRUIT AND SEEDS

Within the genus *Carex*, a successfully pollinated female flower will produce a one-seeded fruit, or achene. Each achene is enclosed in a specialized membrane called a perigynium, which is accompanied by a single leaf-like scale. *Carex* fruit persists longer than the flowers, and anatomic details of the perigynia and enclosed achenes are useful when identifying *Carex*, particularly species within the same section. As with the foliage and flowers of the various species and cultivars in this evaluation, the fruiting structures of *Carex* can range from subtle to highly ornamental and are a welcome addition to landscapes.



Carex muskingumensis 'Oehme'
(Oehme Muskingum sedge) fruit.
Photo: Paul Wilson



Carex vulpinoidea (fox sedge) fruit.
Photo: Paul Wilson



Carex lurida (sallow sedge) fruit.
Photo: Paul Wilson



Carex crinita (fringed sedge) fruit. Photo: Paul Wilson



Carex woodii (Wood's sedge)

CAREX TOP PERFORMERS

Mt. Cuba Center's four-year *Carex* trial aimed to evaluate the horticultural qualities, vigor, and adaptability of 70 different *Carex* species and cultivars. The trial was planted in fall 2017 and supplemental water was provided only during the first year of the evaluation to encourage establishment. Throughout the trial, no fertilizer was added, and plants were given minimal care other than a late winter cutback. Each *Carex* was assessed in both full sun and shade in soils that can be best described as "average": medium-moisture clay-loam with a pH of 6.5. Data were collected and ratings were assigned from spring through fall in 2018, 2019, and 2021. During these weekly/biweekly evaluations of plant vigor and foliage quality, ratings were assigned on a scale of 1–5 (1 being very poor and 5 being excellent). The plant ratings from each year were averaged to determine the final score for each *Carex*. Plants with a final score of 4.2 or higher in sun, shade, or both are featured in this report as top performers.

Carex woodii (Wood's sedge)

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.7	4.4	small	spreading	semi-evergreen	<i>Panicaceae</i>



Carex woodii, or Wood's sedge, is an exceptional species that exemplifies the ornamental value and versatility of sedges in garden settings. Wood's sedge is similar to the popular *C. pensylvanica* as they both possess a low-growing, slow-spreading habit. While these two sedges can occupy similar landscape niches, *C. woodii* is superior to *C. pensylvanica* from both garden utility and ornamental standpoints. Wood's sedge forms a denser mat of foliage than *C. pensylvanica* and is better at suppressing weeds. The fine-textured foliage of Wood's sedge emerges an attractive blue-green hue in spring before changing to green as temperatures increase in late spring and summer. As a bonus, from April through early May, carpets of straw-colored flowers create an eye-catching display and provide the perfect complement to other spring wildflowers. Wood's sedge can be found in forests in the midwestern and eastern United States. As might be expected from a woodland plant, it performed best in shade; however, this species is also exceptionally adaptable to full sun.

***Carex cherokeensis* (Cherokee sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.7	4.3	large	clumping	semi-evergreen	<i>Hymenochlaenae</i>

Carex cherokeensis is a graceful, arching sedge that looks beautiful whether planted as a single specimen or in large masses. The lustrous, dark-green foliage is the primary asset of Cherokee sedge, with peak attractiveness from early summer through early winter. The flowers and fruit of this species, while not overly spectacular or profuse, add interest for a prolonged season from late April through fall. The large size and nearly evergreen nature of Cherokee sedge provides cover for wildlife in the winter months. While most wildlife are a welcome addition to gardens, voles caused extensive damage to the roots and crowns of some *C. cherokeensis* plants. However, the damaged plants rarely succumbed and usually recovered well the next growing season. Yearly maintenance for this species is minimal, typically limited to an optional trim of browned leaf tips in early spring. A complete cutback in late winter or early spring is not recommended for *C. cherokeensis* because it is slow to resume vegetative growth. This species can be found throughout the southern United States in moist woodlands.

***Carex bromoides* (common brome sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.6	4.3	medium	clumping	semi-evergreen	<i>Deweyanae</i>

Carex bromoides occurs in wet and shady conditions in the eastern half of the United States and adapts well to average soils and full sun in cultivation. Common brome sedge forms a tidy medium-sized clump and features fine-textured, flowing foliage. In April, clouds of small golden flowers are produced with the emerging foliage, adding to the already substantial ornamental value of this sedge. The finished flowers eventually arch over and disappear into the growing foliage. Among its many potential landscape uses, this species could be utilized to great effect in large masses intermingled with other perennials. In this setting it can form a weed-suppressing base layer of a mixed planting. Common brome sedge eventually forms a raised crown, and in full sun, the centers of clumps may begin to thin several years after planting. This issue is easily remedied by lifting and dividing the plant in either spring or fall.



***Carex haydenii* (Hayden's sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.5	4.5	large	clumping	deciduous	<i>Phacocystis</i>



Carex haydenii, or Hayden's sedge, is one of the most striking and statuesque species in the trial. Silver spikes of new growth emerge from the ground in early April, followed by elegant, sweeping inflorescences that resemble sprays of rusty brown and white pipe cleaners. As the foliage matures the plant takes on an upright, vase-shaped habit that relaxes to a more mounded profile as the growing season progresses. *Carex haydenii* is similar to *Carex stricta* and they can inhabit the same wet and sunny locations in the wild, although *C. stricta* has a wider geographic range. In the evaluation, *C. haydenii* was taller and more upright than *C. stricta*, but they both produce similarly beautiful floral displays, form strong clumps, and are completely deciduous. Key details of the perigynia are used to differentiate the two species when a positive identification from other traits remains elusive. This species could be utilized in a variety of landscapes with wet-to-average soils and may be particularly well-suited for wet, open meadows and rain gardens.

***Carex stricta* (upright sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.2	4.5	medium	clumping	deciduous	<i>Phacocystis</i>



Carex stricta, also known as upright sedge or tussock sedge, is an attractive species that performs best in full sun. In the evaluation, *C. stricta* formed a medium-sized, deciduous clump. In early spring, silvery fingers of new growth emerge from the crown and eventually give way to a beautiful display of flowers that closely resemble those of *C. haydenii* in timing and appearance. The graceful, deep-green foliage of this species remains attractive all summer and is seemingly unaffected by short periods of drought. While quite at home in the average soils of the Trial Garden, *C. stricta* can be found in wet habitats throughout the eastern United States, sometimes growing as tiny hummocks in standing water. In Delaware wetlands, *C. stricta* plays a critical ecological role as its crowns are utilized for nesting habitat by the endangered bog turtle (see page 19 for more details).

***Carex emoryi* (Emory's sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.1	4.4	large	spreading	deciduous	<i>Phacocystis</i>

Carex emoryi is a spectacular plant but is best suited for use in landscapes with ample space. Emory's sedge spreads readily by underground rhizomes and can overrun small garden beds in a relatively short period of time. *Carex emoryi* has the potential to expand by more than six feet in a single growing season and vigilance is needed to keep it from overwhelming neighboring plants. This fast-growing habit is not without merit, however, as *C. emoryi* could be utilized to great effect when planted in a contained space or used to stabilize wet soils. This sedge could also be planted in wet, sunny meadows along with other competitive native plants to keep out unwanted invasives. Attractive blue-green foliage is the primary ornamental feature of *C. emoryi*; blooms were rarely observed in the evaluation. Emory's sedge can be found throughout the central United States and into the mid-Atlantic region in wet meadows and along streams.

***Carex sprengelii* (long-beaked sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.4	4.0	medium	clumping	semi-evergreen	<i>Hymenochlaenae</i>

Carex sprengelii, also known as long-beaked sedge, is a member of the same section as fellow top performer *C. cherokeensis*, and features similarly desirable ornamental qualities but in a slightly smaller plant. This species starts off its spring growth with an upright fountain-shaped habit replete with nodding inflorescences. Long-beaked sedge shines in April and May as the foliage emerges and the flowers and fruit are produced. The unique wheat-like flowers and seeds are held well above the foliage and add movement and texture to the garden. However, the beautiful floral and fruiting display does not last long as heavy rain can cause the plant to flop. Thankfully a new flush of growth quickly disguises the flattened foliage to create a tidy, though slightly shorter plant through summer and fall. Cutting down the tallest stems either right before or right after the flop occurs can improve the appearance of the plant during June. After several years the clumps developed a hollow center, but timely division should keep the plants full. Long-beaked sedge can be found in woodlands of the northern United States.



***Carex pensylvanica* (Pennsylvania sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.3	4.2	small	spreading	semi-evergreen	<i>Acrocystis</i>

***Carex pensylvanica* ‘Straw Hat’ (Straw Hat Pennsylvania sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.4	4.1	small	spreading	semi-evergreen	<i>Acrocystis</i>

*Carex pensylvanica* (Pennsylvania sedge)*Carex pensylvanica* ‘Straw Hat’ (Straw Hat Pennsylvania sedge)

Both *C. pensylvanica* and *C. pensylvanica* ‘Straw Hat’ are exceptional sedges that are worthy additions to almost any landscape of the mid-Atlantic region. They perform admirably in both sun and shade and will form loose carpets of verdant grassy foliage. Selected by Brent Horvath in Hebron, Illinois, *C. pensylvanica* ‘Straw Hat’, is slower growing than the species, with a growth rate of approximately three feet over four years. In contrast, a single division of *C. pensylvanica* can cover an area of four to five feet in diameter in the same amount of time. The flowers of the species *C. pensylvanica* are not showy or numerous and are easily missed by casual observers when they bloom in April. Straw Hat Pennsylvania sedge, on the other hand, produces a bounty of attractive parchment-colored flowers that rival the ornamental display of *C. woodii*. Both plants are excellent garden companions for taller perennials where they can weave gently amongst their stems, helping to cover ground and suppress weeds. Pennsylvania sedge is widespread through the central and eastern United States where it can be found in open woodlands and other well-drained sites.

***Carex muskingumensis* ‘Little Midge’ (Little Midge Muskingum sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.3	4.2	small	clumping	deciduous	<i>Ovales</i>



Introduced by Limerock Nursery in Port Matilda, Pennsylvania, *Carex muskingumensis* ‘Little Midge’ is one of the most unusual plants in the entire trial. This cultivar is a true miniature that is much smaller than both the species and another trialed cultivar, *Carex muskingumensis* ‘Oehme’. When viewed from above, the keen observer is greeted with a geometric pattern of foliage that resembles green honeycombs. This selection of Muskingum sedge could be an excellent candidate for container gardens or the front of a garden bed, where its details can be appreciated up close. *Carex muskingumensis* ‘Little Midge’ performed well in average soils in both the sun and shade of the Trial Garden. No flowers were observed on *C. muskingumensis* ‘Little Midge’.

***Carex albicans* (white-tinge sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.3	4.1	small	clumping	semi-evergreen	<i>Acrocystis</i>

Carex albicans, or white-tinge sedge, is an attractive plant that produces fine-textured foliage in uniform clumps. Overall, the appearance of this species resembles *C. bromoides*, although these two sedges belong to different sections of the genus and occur in different habitats in the wild. *Carex albicans* can be found in dry woodlands in contrast to the shady and wet conditions preferred by *C. bromoides*. White-tinge sedge, when grown in shade, proved to be quite adaptable to average garden soils and produced lovely compact clumps. Plants grown in full sun displayed rings of new growth with dead centers. This was most noticeable early in the season, but, as with other sedges, this tendency can be corrected with timely division.

***Carex jamesii* (James's sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.3	3.9	small	clumping	semi-evergreen	<i>Phyllostachyae</i>

Carex jamesii is one of the most beautiful sedges in the trial, particularly in spring when the emerald-green foliage is fresh. In midsummer, the tips of the leaf blades bronze and burn, especially in full sun; although this effect is diffuse enough that the plants remain attractive. Established plants form tidy clumps of semi-evergreen foliage that retain their interest and ornamental value in the winter months. Spring cleanup, while not entirely necessary with this species, can consist of a very light cutback in late winter or early spring to refresh its appearance. James's sedge occurs in moist woodlands throughout the eastern half of the United States, so it is not surprising that it performed best in the shaded area of the trial.



***Carex muskingumensis* ‘Oehme’ (Oehme Muskingum sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.1	4.4	medium	clumping	semi-evergreen/deciduous	<i>Ova/les</i>



Carex muskingumensis ‘Oehme’ is the second selection of Muskingum sedge to be rated among the top performers of this evaluation. Much larger than *C. muskingumensis* ‘Little Midge’ and more upright than the species, which has a tendency to sprawl, *C. muskingumensis* ‘Oehme’ is the only sedge with variegated foliage in the trial. Reportedly found in the garden of the noted landscape architect Wolfgang Oehme, this plant has subtle yellow leaf margins. The contrast provided by the variegation is most evident in summer and adds interest best appreciated up close, as the effect is muted when seen from a distance. Arching flowering and fruiting stems are produced in May and continue to add ornamental value and texture to this sedge well into fall. This cultivar of *C. muskingumensis* did exceptionally well in full sun and average garden soils. The typical habitat of this species in the wild suggests it would tolerate, if not prefer, wet soils.

***Carex crinita* (fringed sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.0	4.2	large	clumping	deciduous	<i>Phacocystis</i>



Carex crinita, or fringed sedge, is a statuesque species that provides ornamental interest through the spring and summer. As a completely deciduous sedge, the new growth of *C. crinita* emerges in early April and quickly forms substantial clumps of blue-green foliage. Fringed sedge produces flowering stems with characteristic pendant spikelets in May. While the flowers themselves are relatively short-lived, the developing fruit persists well into fall, adding texture and movement to the landscape for an extended season. As with many deciduous species, the ornamental qualities of fringed sedge begin to wane in fall as the foliage browns and the plant begins to go dormant. *Carex crinita* is native to large portions of the eastern United States, where it can be found in wet habitats including swampy woods and marshes in both full sun and shade.

***Carex leavenworthii* (Leavenworth's sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.2	3.7	medium	clumping	semi-evergreen	<i>Phaestoglochin</i>

Carex leavenworthii is an attractive fine-textured, clump-forming sedge similar to top performers *C. bromoides* and *C. albicans*. Sprays of flowers are produced in mid-to-late April on long, wiry stems that tend to lean soon after they finish blooming. The plants eventually grow a flush of new foliage from their crowns that creates a fuller plant by July. In the wild, Leavenworth's sedge grows in dry, open woodlands but it proved to be quite tolerant and adaptable to the average garden soils in the Trial Garden. This species may have potential for use in dry shade as the foliage remained green and lush during summer droughts when other *Carex* were showing signs of stress.

***Carex plantaginea* (plantain-leaf sedge)**

Shade Rating	Sun Rating	Size Category	Habit	Winter Foliage	Section
4.2	did not complete trial	small	clumping	semi-evergreen	<i>Careyanae</i>

Carex plantaginea is an easily recognized species that features broad, heavily textured foliage. Although nearly evergreen, by the end of winter the tips of the previous year's leaves may be brown and desiccated. This tendency could be tempered by siting plants in protected locations away from direct winter sun. Spring cleanup requires minimal effort, and a hard cutback should be avoided, if possible, because *C. plantaginea* is slow to produce new leaves in spring. Without the previous year's foliage, it does not completely fill out until late spring or early summer. This species has an exceptionally early bloom time, with dark, spear-like flowering stems emerging from the crown in March. This welcome display mixes well with some of the earliest spring ephemerals. Plantain-leaf sedge was a top performer in shade but plants in full sun failed to thrive and did not complete the four-year evaluation. In the wild, plantain-leaf sedge grows in woodlands through the Appalachian Mountains, New England, and around the Great Lakes.



RIGHT CAREX, RIGHT PLACE

The *Carex* identified as top performers in the trial represent species and cultivars that thrive in average garden soils in the mid-Atlantic region. It might be tempting to dismiss sedges that did not achieve the top-performer ranking, but these are not necessarily inferior bad plants. On the contrary, some lower-scoring *Carex* deserve consideration, especially in landscapes that closely match the environmental conditions where these species naturally occur.

Several *Carex* species that are staples of the naturalistic landscapes at Mt. Cuba underperformed in the trial. These species succeed in the garden due to their careful siting by the talented horticulture staff. *Carex appalachica* (Appalachian sedge) and *Carex eburnea* (bristle-leaf sedge) are small sedges that prefer more well-drained soils than can be found in the Trial Garden; these do well in drier sites in the gardens at Mt. Cuba. *Carex grayi* (Gray's sedge), although it just missed the top performer list, is valued for its incredible fruiting structures which resemble a medieval mace, leading it to be one of the most talked-about *Carex* in the garden.

Many *Carex* thrive in conditions that are wetter or drier than the Trial Garden. The following charts were created using information about the natural habitats for the various species in the trial, and can aid selection of *Carex* for various environments.



Carex eburnea (bristle-leaf sedge) in Mt. Cuba's Upper Naturalistic Gardens

Carex for Dry Soils

Carex	Shade	Sun	Size Category	Habit	Winter Foliage	Section
<i>C. albicans</i>	X		medium	clumping	semi-evergreen	<i>Acrocystis</i>
<i>C. appalachica</i>	X		small	clumping	semi-evergreen/deciduous	<i>Phaetoglochin</i>
<i>C. bicknellii</i>		X	medium	clumping	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. brevior</i>	X	X	medium	clumping	deciduous	<i>Ovales</i>
<i>C. eburnea</i>	X		small	clumping	semi-evergreen	<i>Albae</i>
<i>C. gravida</i>		X	medium	clumping	semi-evergreen	<i>Phaetoglochin</i>
<i>C. hirtifolia</i>	X		medium	clumping	semi-evergreen/deciduous	<i>Hirtifoliae</i>
<i>C. leavenworthii</i>	X	X	medium	clumping	semi-evergreen	<i>Phaetoglochin</i>
<i>C. molesta</i>		X	medium	clumping	semi-evergreen	<i>Ovales</i>
<i>C. muehlenbergii</i>	X	X	medium	clumping	semi-evergreen	<i>Phaetoglochin</i>
<i>C. nigromarginata</i>	X		small	clumping	semi-evergreen	<i>Acrocystis</i>
<i>C. pensylvanica</i>	X		small	spreading	semi-evergreen	<i>Acrocystis</i>
<i>C. pensylvanica</i> 'Straw Hat'	X		small	spreading	semi-evergreen	<i>Acrocystis</i>
<i>C. retroflexa</i>	X		medium	clumping	semi-evergreen	<i>Phaetoglochin</i>
<i>C. silicea</i>		X	medium	clumping	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. texensis</i>	X		medium	clumping	semi-evergreen	<i>Phaetoglochin</i>



Carex grayi (Gray's sedge) in Mt. Cuba's Lower Naturalistic Gardens

Carex for Moist-to-Wet Soils

Carex	Shade	Sun	Size Category	Habit	Winter Foliage	Section
<i>C. amphibola</i>	X	X	medium	clumping	semi-evergreen	<i>Griseae</i>
<i>C. annectens</i>		X	medium	clumping	semi-evergreen	<i>Multiflorae</i>
<i>C. barrattii</i>	X		large	spreading	deciduous	<i>Limosae</i>
<i>C. bebbii</i>		X	medium	clumping	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. bromoides</i>	X		medium	clumping	semi-evergreen	<i>Deweyanae</i>
<i>C. canescens</i> var. <i>disjuncta</i>	X	X	small	clumping	semi-evergreen	<i>Glareosae</i>
<i>C. comosa</i>	X	X	large	clumping	semi-evergreen	<i>Vesicariae</i>
<i>C. crinita</i>	X	X	large	clumping	deciduous	<i>Phacocystis</i>
<i>C. decomposita</i>	X	X	large	clumping	semi-evergreen	<i>Heleoglochin</i>
<i>C. emoryi</i>	X	X	large	spreading	deciduous	<i>Phacocystis</i>
<i>C. flaccosperma</i>	X		medium	clumping	semi-evergreen	<i>Griseae</i>
<i>C. folliculata</i>	X		medium	clumping	semi-evergreen	<i>Rostrales</i>
<i>C. gigantea</i>	X		medium	clumping	semi-evergreen	<i>Lupulinae</i>
<i>C. grayi</i>	X	X	large	clumping	semi-evergreen	<i>Lupulinae</i>
<i>C. gynandra</i>	X		large	clumping	deciduous	<i>Phacocystis</i>
<i>C. haydenii</i>		X	large	clumping	deciduous	<i>Phacocystis</i>
<i>C. hystericina</i>		X	medium	clumping	semi-evergreen	<i>Vesicariae</i>
<i>C. intumescens</i>	X	X	medium	clumping	semi-evergreen	<i>Lupulinae</i>
<i>C. joorii</i>	X	X	large	clumping	semi-evergreen	<i>Glaucescences</i>
<i>C. lupuliformis</i>	X	X	large	clumping	semi-evergreen	<i>Lupulinae</i>
<i>C. lurida</i>	X	X	large	clumping	semi-evergreen	<i>Vesicariae</i>
<i>C. mitchelliana</i>	X		large	clumping	deciduous	<i>Phacocystis</i>
<i>C. muskingumensis</i>	X	X	medium	clumping	semi-evergreen	<i>Ovales</i>
<i>C. muskingumensis</i> 'Little Midge'	X	X	small	clumping	deciduous	<i>Ovales</i>
<i>C. muskingumensis</i> 'Oehme'	X	X	large	clumping	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. normalis</i>		X	medium	clumping	deciduous	<i>Ovales</i>
<i>C. scabrata</i>	X		large	spreading	deciduous	<i>Anomalae</i>
<i>C. scoparia</i>		X	medium	clumping	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. socialis</i>	X		medium	clumping	semi-evergreen	<i>Phaetoglochin</i>
<i>C. squarrosa</i>	X		large	clumping	deciduous	<i>Squarrosae</i>
<i>C. stipata</i> var. <i>maxima</i>	X	X	medium	clumping	semi-evergreen	<i>Vulpinae</i>
<i>C. stricta</i>	X		medium	clumping	deciduous	<i>Phacocystis</i>
<i>C. trichocarpa</i>	X	X	large	spreading	deciduous	<i>Carex</i>
<i>C. typhina</i>	X		large	clumping	deciduous	<i>Squarrosae</i>
<i>C. vulpinoidea</i>		X	large	clumping	semi-evergreen	<i>Multiflorae</i>



Carex stricta (upright sedge) habitat

THE ECOLOGICAL VALUE OF CAREX

Although no data were collected on wildlife interactions with the various species and cultivars of *Carex* in this trial, it does not mean that sedges are devoid of ecological value. The truth is quite the opposite as *Carex* species provide food and habitat to a diversity of wildlife both in the wild and in the garden.

Carex as Host Plants

Although most *Carex* are wind pollinated, and thus of little value to pollinating insects, they do provide nutrition and sustenance to various species through other avenues. The seeds of *Carex* are readily eaten by small mammals and birds, and the leaves are consumed by caterpillars of numerous species of butterflies and moths. Several caterpillars were observed feeding on *Carex* in the Trial Garden, including those of the yellow-collared scape moth (*Cisseps fulvicollis*), an unusual moth with iridescent blue and black wings and a characteristic yellow collar just behind its head. The caterpillars were seen browsing the leaves of *Carex hirtifolia* (pubescent sedge), and adult moths were later observed nectaring on goldenrods in the nearby *Solidago* trial. All stages of this insect's life cycle were supported by plants within the confines of the Trial Garden. This one example of the ecological value provided by a relatively unassuming *Carex* species serves as a valuable reminder of the sometimes subtle, but nonetheless invaluable, ecological contributions that native plants can have even in a cultivated setting.



Yellow-collared scape moth caterpillar.
Photo: Paul Wilson



Yellow-collared scape moth



DID YOU KNOW? While most sedges are wind pollinated, *Carex fraseriana* (Fraser's sedge), formerly *Cymophyllus fraseri*, lures insect pollinators with its fragrant white flowers. Although not included in the trial, this fascinating species can be seen in the naturalistic gardens at Mt. Cuba Center.



Carex stricta (upright sedge) in Mt. Cuba Center's greenhouse

Carex as Habitat

Carex species provide habitat for an abundance of wildlife large and small. In the Trial Garden, numerous small invertebrates and several species of reptiles and amphibians were observed taking refuge in the *Carex* plot. While toads and frogs might take up residence in sedge plantings within a home landscape, some wildlife interactions are so specialized that they will probably not be observed in most back yards.

One such interaction features the endangered bog turtle (*Clemmys muhlenbergii*) which utilizes the elevated tussocks of *Carex stricta* for nesting sites. For several years, Mt. Cuba Center has partnered with the state of Delaware to help expand suitable bog turtle habitat and support these imperiled animals in the wild. Beginning with wild-collected material, the greenhouse team at Mt. Cuba Center propagates and grows dozens of plants each year. In fall, established *C. stricta* are planted back at the bog turtle site. Since the beginning of this partnership, clutches of eggs have been observed among these reintroduced plants.



A clutch of bog turtle eggs in the crown of an upright sedge.
Photo: Nathan Nazdrowicz



Hatchling bog turtle. Photo: Nathan Nazdrowicz



Adult bog turtle. Photo: Nathan Nazdrowicz



Carex woodii (Wood's sedge)

CAREX AS A LAWN ALTERNATIVE

Carex is frequently mentioned as a possible alternative to the traditional high-maintenance turfgrass lawn. The compact habit and grassy, fine-textured foliage of several *Carex* species can effectively mimic a carpet of cool-season grasses, and require limited inputs once they are established.

To Mow or Not to Mow...

In 2022, a yearlong mowing trial was conducted to identify sedges that are tolerant to regular disturbance and those that may be viable mowed-lawn alternatives. A portion of every surviving *Carex* in both sun and shade was mowed with a push mower; individual plants of each were left unmowed for comparison. The mower blades were set at four inches and mowing took place on a biweekly basis from early May through late August. The plants in the mowing trial received no supplemental water or fertilizer.

The vast majority of *Carex* proved to be tolerant of regular mowing, although many of the species with medium- and coarse-textured foliage did not display the traditional aesthetic of mowed turfgrass. Several small-to-medium-sized sedges with fine-textured foliage looked particularly convincing as a lawn alternative and, in some cases, mowed plants performed better than their unmowed counterparts. Species with rhizomatous habits could be of particular utility as they would continuously knit together and fill gaps in the lawn. Another added benefit of these spreading *Carex* species is that fewer plants would be needed at the initial planting installation. Some of these species spread considerably over time as opposed to those clump-forming species that cover less ground individually.

Continued research on the durability of *Carex* lawns is needed to determine which species tolerate foot traffic as is often expected of traditional turfgrass in the landscape.

BEST CAREX FOR MOWING

The mowed *Carex* were rated on a scale of 1–5 (1 being very poor and 5 being excellent) on a biweekly basis from early May through late August. Plants were judged for their tolerance to mowing and for their suitability as a mowed-lawn alternative. The best *Carex* for mowed-lawn alternatives, described on page 21, achieved an average score of 4.2 or higher in sun, shade, or both.

**Carex woodii (Wood's sedge)**

Shade Mowed Rating	Sun Mowed Rating	Habit
4.9	4.9	spreading

Building on its stellar reputation earned in the regular trial, *Carex woodii* was also a top-rated plant in the mowing evaluation. Performing exceptionally well in both sun and shade, this species developed into dense mats that efficiently covered ground and suppressed weeds.

**Carex eburnea (bristle-leaf sedge)**

Shade Mowed Rating	Sun Mowed Rating	Habit
4.6	3.6	clumping

Carex eburnea has the narrowest foliage of any sedge in the trial and is quite similar in appearance to fine fescue turfgrass. This species forms low-growing clumps that spread very slowly over time. *Carex eburnea* occurs in rocky soils and outcrops in the wild and could be a great lawn option in dry sites.

**Carex socialis (low woodland sedge)**

Shade Mowed Rating	Sun Mowed Rating	Habit
2.4	4.6	clumping

Carex socialis is a species that was dramatically improved by mowing in this evaluation. Unmowed plants became weak after the first years of the trial, but when mowed, this species bounced back with surprising vigor. In full sun *C. socialis* developed dense, impenetrable clumps that would be the envy of any turfgrass enthusiast.

**Carex pensylvanica (Pennsylvania sedge)**

Shade Mowed Rating	Sun Mowed Rating	Habit
4.3	4.4	spreading

Carex pensylvanica is a tried-and-true species in the landscape that unsurprisingly was a good candidate for mowed *Carex* lawns. This species gently covers ground although there are small gaps present in the carpets of foliage that are exploited by opportunistic weeds.

**Carex jamesii (James's sedge)**

Shade Mowed Rating	Sun Mowed Rating	Habit
4.0	4.4	clumping

The dark-green foliage of this plant is put into direct focus when it is mowed, and individual plants make consistent and orderly clumps. Since *Carex jamesii* is not rhizomatous and does not have a large footprint when mowed, many closely spaced plants would be needed to work as a lawn substitute.

TRIAL PERFORMANCE SUMMARIES

Carex	Shade Rating	Sun Rating	Avg. HxW (Foliage)	Growth Habit	Texture	Winter Foliage	Section
C. albicans	4.3	4.1	12" x 33"	clumping	fine	semi-evergreen	Acrocystis
<i>C. albursina</i>	3.7	*	11" x 23"	clumping	coarse	semi-evergreen	<i>Laxiflorae</i>
<i>C. amphibola</i>	4.1	3.9	17" x 32"	clumping	medium	semi-evergreen	<i>Griseae</i>
<i>C. annectens</i>	3.2	3.6	17" x 27"	clumping	fine	semi-evergreen	<i>Multiflorae</i>
<i>C. appalachica</i>	2.8	*	8" x 16"	clumping	fine	semi-evergreen/deciduous	<i>Phaetoglochin</i>
<i>C. barrattii</i>	4.0	3.9	29" x 64"	spreading	medium	deciduous	<i>Limosae</i>
<i>C. bebbii</i>	2.9	3.2	15" x 32"	clumping	fine	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. bicknellii</i>	3.6	3.6	17" x 23"	clumping	fine	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. blanda</i>	3.6	3.3	12" x 24"	clumping	medium	semi-evergreen	<i>Laxiflorae</i>
<i>C. brevior</i>	2.2	2.8	18" x 23"	clumping	medium	deciduous	<i>Ovales</i>
C. bromoides	4.6	4.3	16" x 33"	clumping	fine	semi-evergreen	Deweyanae
<i>C. canescens</i> var. <i>disjuncta</i>	3.4	2.9	11" x 33"	clumping	medium	semi-evergreen	<i>Glareosae</i>
C. cherokeensis	4.7	4.3	35" x 61"	clumping	medium	semi-evergreen	Hymenochlaenae
<i>C. comosa</i>	3.3	3.5	30" x 51"	clumping	coarse	semi-evergreen	<i>Vesicariae</i>
C. crinita	4.0	4.2	41" x 61"	clumping	coarse	deciduous	Phacocystis
<i>C. cumberlandensis</i>	2.7	*	12" x 24"	clumping	fine	semi-evergreen	<i>Careyanae</i>
<i>C. cumberlandensis</i> 'Jacksboro'	*	*	12" x 20"	clumping	fine	semi-evergreen	<i>Careyanae</i>
<i>C. decomposita</i>	3.7	3.6	25" x 44"	clumping	medium	semi-evergreen	<i>Heleoglochin</i>
<i>C. eburnea</i>	3.4	3.4	9" x 20"	clumping	fine	semi-evergreen	<i>Albae</i>
C. emoryi	4.0	4.4	40" x indeterminate	spreading	coarse	deciduous	Phacocystis
<i>C. flaccosperma</i>	3.7	3.4	15" x 31"	clumping	coarse	semi-evergreen	<i>Griseae</i>
<i>C. folliculata</i>	3.0	2.6	14" x 23"	clumping	coarse	semi-evergreen	<i>Rostrales</i>
<i>C. gigantea</i>	2.3	2.1	20" x 40"	clumping	coarse	semi-evergreen	<i>Lupulinae</i>
<i>C. glaucodea</i>	3.3	3.3	6" x 22"	clumping	medium	semi-evergreen	<i>Griseae</i>
<i>C. gracillima</i>	3.6	3.6	13" x 21"	clumping	coarse	semi-evergreen	<i>Hymenochlaenae</i>
<i>C. gravida</i>	2.7	3.0	17" x 26"	clumping	medium	semi-evergreen	<i>Phaetoglochin</i>
<i>C. grayi</i>	3.7	3.5	29" x 50"	clumping	coarse	semi-evergreen	<i>Lupulinae</i>
<i>C. grisea</i>	4.1	3.9	13" x 29"	clumping	medium	semi-evergreen	<i>Griseae</i>
<i>C. gynandra</i>	3.7	3.6	31" x 51"	clumping	coarse	deciduous	<i>Phacocystis</i>
C. haydenii	4.5	4.5	31" x 61"	clumping	medium	deciduous	Phacocystis
<i>C. hirtifolia</i>	3.6	*	17" x 38"	clumping	medium	semi-evergreen/deciduous	<i>Hirtifoliae</i>
<i>C. hystericina</i>	3.2	3.5	16" x 40"	clumping	medium	semi-evergreen	<i>Vesicariae</i>
<i>C. intumescens</i>	2.8	*	17" x 35"	clumping	medium	semi-evergreen	<i>Lupulinae</i>
C. jamesii	4.3	3.9	15" x 24"	clumping	fine	semi-evergreen	Phyllostachyae
<i>C. joorii</i>	2.7	2.9	23" x 23"	clumping	medium	semi-evergreen	<i>Glaucoscentes</i>
<i>C. laxiculmis</i>	4.0	3.4	10" x 20"	clumping	coarse	semi-evergreen	<i>Careyanae</i>
<i>C. laxiculmis</i> 'Hobb'	3.9	3.3	10" x 18"	clumping	coarse	semi-evergreen	<i>Careyanae</i>
<i>C. laxiflora</i>	3.6	4.0	10" x 21"	clumping	coarse	semi-evergreen	<i>Laxiflorae</i>
C. leavenworthii	4.2	3.7	18" x 31"	clumping	fine	semi-evergreen	Phaetoglochin
<i>C. lupuliformis</i>	2.9	2.2	23" x 36"	clumping	coarse	semi-evergreen	<i>Lupulinae</i>
<i>C. lurida</i>	3.7	3.6	21" x 33"	clumping	medium	semi-evergreen	<i>Vesicariae</i>
<i>C. mitchelliana</i>	3.9	3.9	36" x 42"	clumping	coarse	deciduous	<i>Phacocystis</i>
<i>C. molesta</i>	3.4	3.5	13" x 28"	clumping	medium	semi-evergreen	<i>Ovales</i>

Carex	Shade Rating	Sun Rating	Avg. HxW (Foliage)	Growth Habit	Texture	Winter Foliage	Section
<i>C. muehlenbergii</i>	2.8	2.8	27" x 49"	clumping	medium	semi-evergreen	<i>Phaetoglochin</i>
<i>C. muskingumensis</i>	3.1	3.2	17" x 45"	clumping	medium	semi-evergreen	<i>Ovales</i>
<i>C. muskingumensis</i> 'Little Midge'	4.3	4.2	13" x 14"	clumping	fine	deciduous	<i>Ovales</i>
<i>C. muskingumensis</i> 'Oehme'	4.1	4.2	28" x 38"	clumping	medium	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. nigromarginata</i>	3.1	2.8	15" x 26"	clumping	medium	semi-evergreen	<i>Acrocystis</i>
<i>C. normalis</i>	3.4	3.4	13" x 25"	clumping	medium	deciduous	<i>Ovales</i>
<i>C. pennsylvanica</i>	4.3	4.2	15" x 54"	spreading	fine	semi-evergreen	<i>Acrocystis</i>
<i>C. pennsylvanica</i> 'Straw Hat'	4.4	4.1	14" x 38"	spreading	fine	semi-evergreen	<i>Acrocystis</i>
<i>C. planispicata</i>	3.3	3.6	12" x 27"	clumping	medium	semi-evergreen	<i>Griseae</i>
<i>C. plantaginea</i>	4.2	*	13" x 26"	clumping	coarse	semi-evergreen	<i>Careyanae</i>
<i>C. platyphylla</i>	*	*	9" x 18"	clumping	coarse	semi-evergreen	<i>Careyanae</i>
<i>C. radiata</i>	3.9	3.6	11" x 30"	clumping	fine	semi-evergreen	<i>Phaetoglochin</i>
<i>C. retroflexa</i>	3.6	3.7	17" x 42"	clumping	fine	semi-evergreen	<i>Phaetoglochin</i>
<i>C. rosea</i>	3.6	3.5	11" x 35"	clumping	fine	semi-evergreen	<i>Phaetoglochin</i>
<i>C. scabrata</i>	4.0	3.8	25" x 56"	spreading	coarse	deciduous	<i>Anomala</i>
<i>C. scoparia</i>	3.4	3.5	17" x 34"	clumping	fine	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. silicea</i>	2.8	3.8	17" x 19"	clumping	fine	semi-evergreen/deciduous	<i>Ovales</i>
<i>C. socialis</i>	3.3	3.6	11" x 33"	clumping	fine	semi-evergreen	<i>Phaetoglochin</i>
<i>C. sprengelii</i>	4.4	4.0	20" x 40"	clumping	medium	semi-evergreen	<i>Hymenochlaenae</i>
<i>C. squarrosa</i>	3.4	3.8	25" x 41"	clumping	medium	deciduous	<i>Squarrosae</i>
<i>C. stipata</i> var. <i>maxima</i>	3.4	3.9	13" x 38"	clumping	medium	semi-evergreen	<i>Vulpinae</i>
<i>C. stricta</i>	4.2	4.5	25" x 38"	clumping	medium	deciduous	<i>Phacocystis</i>
<i>C. texensis</i>	3.6	3.3	10" x 34"	clumping	fine	semi-evergreen	<i>Phaetoglochin</i>
<i>C. trichocarpa</i>	3.5	3.9	45" x indeterminate	spreading	medium	deciduous	<i>Carex</i>
<i>C. typhina</i>	4.0	4.0	30" x 48"	clumping	coarse	deciduous	<i>Squarrosae</i>
<i>C. vulpinoidea</i>	4.0	3.9	28" x 43"	clumping	medium	semi-evergreen	<i>Multiflorae</i>
<i>C. woodii</i>	4.7	4.4	14" x 46"	spreading	fine	semi-evergreen	<i>Panicaceae</i>

Rating Key: 5=excellent, 4=good, 3=fair, 2=poor, 1=very poor. Plants in **bold** are top performers.

* Did not complete the trial

Visit mtcubacenter.org/carex for complete descriptions of all 70 *Carex* in the trial.



Up Next: *Vernonia* for the Mid-Atlantic Region

Vernonia, also known as ironweed, is a genus of unsung aster relatives with tremendous horticultural and ecological potential in gardens. All ironweeds native to eastern North America bloom in late summer and fall, with clusters of purple flowers that attract an abundance of pollinators. The floral homogeneity of *Vernonia* belies an incredible diversity in size, texture, and soil preference within this genus. Mt. Cuba Center's trial features 45 species and cultivars of ironweeds and aims to determine those plants that are best suited for gardens and wildlife in the mid-Atlantic region.



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ABOUT MT. CUBA CENTER

Mt. Cuba Center is a botanic garden that highlights the beauty and value of native plants to inspire conservation. Once the private estate of Pamela and Lammot du Pont Copeland, the public garden opened for general admission in 2013 and now spans more than 1,000 acres. It features captivating blooms along garden pathways in formal and woodland settings, picturesque meadows and ponds with stunning vistas, and more than two miles of scenic trails. Mt. Cuba is recognized as a leader in native plant research and open space preservation, having protected 14,000 acres in the mid-Atlantic region. Learn more at mtcubacenter.org.

ABOUT TRIAL GARDEN RESEARCH

Mt. Cuba Center's Trial Garden, managed by Sam Hoadley, evaluates native plants and their related cultivars for their horticultural and ecological value. This research aims 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 wild hydrangea, *Echinacea*, *Helenium*, *Phlox*, *Monarda*, *Baptisia*, *Coreopsis*, *Heuchera*, and asters. Visit mtcubacenter.org/trial for detailed information on each trial.

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FRONT COVER

Carex haydenii ©Mt. Cuba Center, 2022. All Rights Reserved.