THE MEADOW PLANTS AT
MT. CUBA CENTER INC.

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Meadow Plants at Mt. Cuba Center

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Mission

Mt. Cuba Center, the region’s premier native plant garden, is a non-profit organization set on nearly 600 acres in the rolling hills of northern Delaware. Our mission is to foster an appreciation for plants of the Appalachian Piedmont and the conservation of their environment through garden display, education and research.
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Purpose

The purpose of this guide is to showcase the meadow plants of Mt. Cuba Center. I wanted to explain the environmental advantages of meadow landscapes and to show how anyone can use these plants in their gardens. Included is a reading list for those who wish to delve deeper into this topic. Admittedly, this book does not dwell extensively on meadow installation techniques. I feel this is best addressed by others who have researched and documented this step. I prefer to emphasize the careful cultivation of meadow plants in which I have more than 20 years experience.

The following eight grasses and 30 wildflowers were selected because they possess characteristics that make them great contributors to any meadow garden. They are generally easy to grow if their basic needs are met. This selection of plants displays a long season of bloom and has great wildlife value.

The photographs are intended to highlight the wide diversity of shapes and colors of meadow plants. Readers will enjoy vignettes and up-close views of plants captured by myself and others.

Acknowledgments

First and foremost I thank our founder Mrs. Copeland, for her vision of Mt. Cuba Center as a public garden that supports native plants and naturalistic gardening. Mrs. Copeland instilled in me the skill of careful observation of both plants and garden design.

Thank you also to F. M. Mooberry, Neil Diboll, Jeffrey Keller, Larry Weaner, and Art Gover for my earliest lessons in meadow plants and meadow management. Roger Latham and Craig Harper both taught me about natural meadow habitats and meadow management.

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Lastly, I must thank Jessica Gajdatsy, a Mt. Cuba Center summer intern, for her initiation of this project and the whole Public Programs department at Mt. Cuba Center who helped in so many ways to put this guide together.

Why Use Native Plants?

In the past, native plants were promoted for their beauty, an ability to provide a sense of place, and the preservation of our natural heritage. Native plants were also touted as better suited to their native habitat than plants from other ecosystems. We are now discovering that, to sustain our native wildlife populations in the midst of the destruction of their natural habitats, it is more critical than ever to encourage the use of native plants in the garden.

Creating biodiversity and supporting a varied ecosystem in the garden has become the new imperative as we move towards the future with limited resources. Much of what was once open fields and woodlands are now homes for growing families. Even the farmer’s fence row, a natural habitat for many song birds and insects, is being plowed under to meet the needs of an increasing population. We are increasingly finding that the only oases left for our native organisms are suburban gardens, right-of-ways, and common areas.
In *Bringing Nature Home*, Dr. Douglas Tallamy makes a strong case for using native plants in the landscape. “Most of our native plant eaters (insects) are not able to eat alien plants, and we are replacing native plants with alien species at an alarming rate... All plants are not created equal, particularly in their ability to support wildlife ... unless we restore native plants to our suburban ecosystems, the future of biodiversity in the United States is dim.” We are also finding that native pollinators (bees, wasps, butterflies, birds, and more) are dependent upon native plants for survival as some are very specific to a given native plant. The book *Attracting Native Pollinators* by the Xerces Society outlines how native pollinators are critical to our food production. Stephen Kress, author of *The Audubon Society Guide to Attracting Birds* further connects native birds with native plants. Native plants are key to sustaining a healthy ecosystem.

By planting native plants in our own garden, we encourage native insects, birds, reptiles, mammals and other wildlife to thrive. Should an entire neighborhood or community decide to grow native plants, an even more beneficial, continuous site can be created for these animals. We all can make a difference by starting in our own backyard.

### A History of the Mt. Cuba Center Meadow—Planned or Happenstance?

Mr. and Mrs. Lammot du Pont Copeland acquired property along the Red Clay Creek in an area known as Mt. Cuba in 1935. They began to develop it by building a home for their young family. In 1950, the Copelands purchased an adjacent property consisting of nearly 18 acres. In the 1960’s, with the assistance of landscape architect Seth Kelsey, they
began to consider designing the gardens for potential public use. By 1965, land was cleared to create pathways and ponds.

During this time, the meadow site was an open field of *Andropogon virginicus*. Mr. and Mrs. Copeland were able to see this from the road as they drove from Ashland. Mrs. Copeland particularly enjoyed this view. It wasn’t until the late 1970’s when Nan Fairbrother, an English landscape architect, visited the Copeland’s property that changes began for the meadow. While enjoying cocktails at the gazebo by the pond, she commented that the meadow was the loveliest thing and the Copelands must never give it up. With that suggestion, the Copelands began the process of nurturing the meadow. Dr. Richard Lighty, from the University of Delaware, was hired in 1979 to consult with the Copelands regarding their “sage” field - a term they used for the meadow. In 1983, when Dr. Lighty became the first Director of Mt. Cuba Center, many large trees had already begun to compete with the *Andropogon virginicus*.

In order to let the grass flourish, the painful process of removing trees was started. Sometimes Mrs. Copeland would debate the removal of a tree for several years before deciding. She took these decisions very seriously and looked at the tree placement from every angle.
In 1991, when I began to work in the meadow, *Andropogon virginicus* had to compete with aggressive non-native grasses like orchard grass and tall fescue. Former gardeners had fought tough battles with other weeds such as brambles and Oriental bittersweet. Bit by bit, these areas of non-native grasses were eliminated and replaced with warm season native grasses like *Andropogon virginicus* and *Schizachyrium scoparium*.

Today the meadow is about two acres in size, flanked by dogwoods and many other native trees. It can be enjoyed not only from the gazebo, but also through tree-framed portals along the Dogwood Path and from the top of the meadow where visitors have an unblocked view of the ponds below. Through our education programs, many visitors to the meadow have been inspired by its beauty and diversity. If one is quiet, perhaps they will observe finches dining on seed heads or native bees busy gathering food for their brood.

**Meadow Composition**

Meadows can appear very different, even if they have the same types of plants. The balance of grasses and wildflowers, and the placement of drifts, all contribute to the meadow composition. Mrs. Copeland’s design concept for the meadow consisted of a high percentage of grasses interspersed with spots of color from native wildflowers. This was her idea of a very natural-looking grassland.

In creating your own meadow, determine the grass to wildflower ratio that appeals to you. With the current concern for native pollinators, the Xerces Society urges a much higher ratio of native wildflowers to grasses
(about 70% native wildflowers). Wildflowers are a great food source for native pollinators.

The site may also dictate your plant selections. Some plants tolerate fluctuating moisture levels or higher levels of shade better than others. This is true for both grasses and wildflowers. Most grasses are sun-loving. The height of your grasses will also influence which perennials will mix most effectively and not get lost.

Ultimately, your meadow will be steered by the site. Meadow plants will thrive in conditions that they deem favorable and disappear from less suitable areas.

So regardless of your final decision on how many grasses or wildflowers to plant, creating a meadow will generate many environmental benefits, reduce fossil fuel inputs, and give you a beautiful garden filled with birds, butterflies and bees to enjoy.
What is a Meadow?

There are three terms used to describe grassland. The word “meadow” is an old-English term referring to an area where grasses predominate. “Prairie” comes from the French word for grassland. In the United States, prairie usually refers to the expansive native grasslands of the Midwest. The word “savanna” is a term describing large areas of grass interspersed with trees. Savannas can be found in the southeastern United States.

Our meadow at Mt. Cuba Center is an example of an old field successional meadow. Grasses and perennials are at the first stages of succession following the abandonment of agricultural land. As in much of the eastern United States, the rich soils and adequate rainfall promote a quick reversion to forests. However, by preventing the growth of trees and invasive plants, we maintain this area as a meadow.

Grasslands exist either naturally or through human intervention. Natural grasslands exist because of unusual soil types, high or low water tables, or low rainfall. Serpentine, diabase, and shale barrens are examples of grasslands determined by unusual soil types. Temporary grassland can also occur when storms create an opening in the forest. This opportunity allows sun-loving plants to flourish until the gap is filled by trees.

Before European settlement, there were many large prairies, meadows, and savannas that Native Americans kept as grassland through fire management. This practice enabled them to grow crops, promote the growth of blueberries, and provide grazing land for deer, elk, and buffalo. The Native Americans also deliberately burned areas to reduce the amount of flammable plant material that could cause catastrophic fires if left untended.
Finally, fires were set to help hunting. After European settlement, inhabitants of the southeastern United States continued to burn savannas to maintain them as valuable grazing land.

Modern military bases can also be the site of large grasslands consisting of thousands of acres. Some are maintained in grassland for training exercises like parachuting or other military training. Fort Indiantown Gap in Pennsylvania has the largest unplanted grassland in the state and is the only refuge east of the Mississippi for the Regal Fritillary butterfly. The frequent trampling by tanks, and fires set by military exercises creates a habitat for the arrow-leaved violet, a plant that thrives in disturbed areas and the larval food specific to this butterfly.

Another unusual modern refuge of sun-loving plants is power line and gas pipeline right-of-ways. These right-of-ways are regularly mowed or spot-sprayed to keep out woody growth. These modern meadowlands are frequently surveyed by botanists looking for rare and unusual plants.

**Establishing a Meadow**

There are many ways to establish a meadow. Site analysis is the first step. Ask yourself the following questions prior to any plant selections. Does the area have at least a half day of direct sunlight? What is the soil composition? Is the meadow area generally dry, or does it have low wet spots? What was growing there previously? These answers will guide your plant choices.

After you have taken note of the physical characteristics and even mapped the low spots, have the soil tested. This can be done by the state extension service.
soil lab. Review the test results for pH levels as well as soil composition, i.e. the clay, sand, and organic matter content. This analysis will direct the preparation of the meadow and its plant selection.

The rest will depend on several factors such as your budget, size of the area, and the amount of time you are willing to wait for visible results.

For a more detailed look at meadow site analysis and preparation, refer to the following websites:


Some good books on the subject include, *Native Warm-Season Grasses* by Craig Harper and *Urban and Suburban Meadows* by Catherine Zimmerman. Additional recommendations are outlined in the back of the book.

The key to good meadow establishment, is initially taking the time to ensure that the intended meadow area is free of weeds. Also, any dormant weed seeds in the soil need to be reduced. This is probably the most frustrating part of meadow development, but also the most crucial.

The first step to weed reduction is eliminating existing vegetation. The most commonly used methods are smothering the vegetation with newspaper (covered with mulch), or using a herbicide such as glyphosate. Areas with existing turf could also be stripped. In most cases, tilling is not recommended because it exposes the existing seeds in the soil to sunlight and increases weed seed germination. Do not incorporate organic matter or fertilizers into your meadow, as most meadow plants perform better in poor, low fertility soils. Rich soils contribute to excessive soft plant growth, resulting in a floppy appearance.
Installing a Meadow

There are several ways to plant your meadow. The least expensive is hand broadcasting seed. The seed is usually mixed with vermiculite to help spread it across large areas. Ernst Seeds and Brandywine Conservancy are two local seed sources. See the list at the end of this guide for additional sources.

Another method is the use of plug plants. Plugs are usually small plants that are less than one year old. If you have a bigger budget, you can add larger plants. An advantage of using plugs is that they grow faster than seeds and the meadow establishes quickly.

You may elect to utilize both of the above-mentioned methods to create your meadow. First, broadcast seed, then plant plugs or larger plants along the edge. This allows for a quick visual impact while maintaining a reasonable budget.

The third method of creating a meadow is to use a no-till seed drill. This is a specialized piece of equipment designed to sow the tiny seeds of native grass along with wildflower seed. This method is most economical for large sites.

For the mid-Atlantic region, the best time of year to plant warm season native grasses, regardless of method, is the second half of May through June. Warm season native grasses require warm soils to grow new roots and get established before the onset of winter.

If planted later, the roots will not grow enough to keep plants from frost heaving and dying during the winter. To add perennials to an existing grass meadow, plant in early spring. Make provisions for watering in the first year, in case nature doesn’t supply enough rain.
Planting plugs is much easier using a modern clutch-equipped, gas powered auger as depicted on the right. The job gets done quickly and with less effort than hand digging. When plugs are properly planted, they can get off to a very quick start. Even so, it may take from one to three years to establish a meadow.

**Meadow Maintenance**

Maintenance in an established meadow starts with annual mowing in late winter or early spring. At Mt. Cuba Center, we mow using a lawn tractor equipped with a vacuum box pulled behind the tractor. We cut the meadow to approximately 5” high. The mower picks up much of the grass and chops it up. The chopped grass is saved to use as mulch on new plantings. This chopped grass is the best mulch for new meadow plantings, preferable to hardwood or other wood mulches.

Small meadows can be cut with a gasoline-powered lawn trimmer. A sharp steel blade mounted on a grass trimmer or brush cutter works particularly well on tough meadow grass stems.

Another method is controlled fire or prescribed burning. Much planning must go into a burn plan. Make a complete review of local laws to ensure you are in compliance. Contact the local fire companies and your neighbors to inform them of your plans. You may need the assistance of the fire company to ensure safety. It is recommended to burn only a third
of your meadow each year. The unburned portions will act as a refuge for overwintering wildlife.

Throughout the rest of the year, regularly monitor the meadow for weeds. Pay close attention to invaders that might be very aggressive like Japanese honeysuckle, Oriental bittersweet, brambles, Canada thistle, mugwort, and multiflora rose.

Such weeds can be controlled by spot spraying with herbicides, hand pulling, cutting the entire plant to the ground, or removing seed heads before dispersal. We employ all of these methods at Mt. Cuba Center.

If you have questions after consulting the reading list, direct specific inquiries to the Ask the Horticulturist section of Mt. Cuba Center CONNECT’s Meadow book.

**Meadows and Neighbors**

American culture celebrates the perfectly manicured and weed-free lawn. Many of us have spent hours on riding mowers, or hired lawn services so that we can show off a perfect lawn. Anything deviating from this goal might be looked upon as different, strange or worse, even bad. There are a few things you may want to consider when designing your meadow garden to gain acceptance and backing from your neighbors and the public at large.

Appearance is important. The first tip is to have a tidy border surrounding your meadow, such as a mowed grass edge and possibly even fencing. This lets neighbors know that it is an intentional garden. Your meadow is not the result of laziness or a reluctance to mow. It is definitely not a patch of weeds.

© Larry Weaner Landscape Associates
Secondly, create an inviting path through your meadow. By bringing people into the meadow, you give them a better opportunity to experience the beautiful space first hand. The entrance to the path might be highlighted by a little fencing, an arch, or a sign.

Tell them what this meadow is all about. Official signage that recognizes your work and its impact on the environment is also good in allaying your neighbor’s angst. The following are organizations that will assist you in certifying your meadow:

- **Pollinator Friendly Garden**
  (certification through Penn State Extension Service)
- **Certified Wildlife Habitat** under the National Wildlife Federation
- **Bird Habitat Recognition Program** from Audubon Pennsylvania

All of these programs provide you with a very nice plaque to display. In order to qualify, you will need to fill out a relatively simple survey describing your property.

When designing your meadow, make sure to use shorter grasses near the paths. Studies indicate that people do not like walking close to tall grasses like big bluestem (*Andropogon gerardii*) and yellow Indian grass (*Sorghastrum nutans*). They prefer to see where they are going.

Finally, plant showy flowering meadow plants in prominent locations where...
neighbors will see them easily (even if only from afar). The surest way to win someone over is for them to enjoy what they see. Make sure to invite neighbors for a stroll through the meadow. This way they can share your pleasure in watching butterflies gathering food, delight in the calls and songs of birds, and smell the intoxicating fragrance of phlox.

Here are a few ways to incorporate meadow plants into the landscape:

- Around homes and pools
- Within open spaces of developments and planned communities
- Beside corporate centers
- In golf course rough areas and general landscaping around golf courses
- Plantings around retention basins or rain gardens in place of them
- Along driveways or even in containers.
Meadows used beside corporate buildings. © Neil Diboll of Prairie Nursery

Deck view of meadow plants. © Mark Gormel for Jessie Benjamin Taproot Native Design

A lovely and wildlife-friendly lawn alternative. © Christina Kobland of Native Return LLC

Showy grasses beside the fairways. © Hoffman Nursery
A power line right-of-way provides a great opportunity to create a meadow habitat.
© Fay Kobland Native Return LLC

Wildflowers and grasses line the driveway.
© Pat Hill

Meadow plants as a foundation planting.
© Donna VanBruecken

Fencing defines a meadow area.
© Ian Caton of Larry Weaner Landscape Associates
The Grasses of Mt. Cuba Center’s Meadow

We favor warm-season native grasses in the Meadow, such as *Andropogon virginicus*, *Schizachyrium scoparium*, *Andropogon gerardii*, *Sorghastrum nutans*, *Muhlenbergia capillaris*, and *Sporobolus heterolepis*.

They grow more efficiently in the hot, dry summer weather than other grasses. The warm-season native grasses are so described because they only start to grow in late spring when daily temperatures reach 60° F, and the soil temperature reaches 55° F. They are more efficient in the heat because they use a different photosynthetic pathway than other plants and are called C4 plants. (They fix sugars at higher temperatures using 4-carbon atoms.) As a result, they out-compete their botanical challengers. These grasses are tough!

*Andropogon virginicus* and *Schizachyrium scoparium* make up the bulk of the grass element in our meadow. They were selected for several reasons. The first is their stature; they are short enough that wildflowers can be viewed from all angles. The second reason for this choice is the fact that they are clumping grasses rather than sod-forming. This characteristic enables them to grow better with wildflowers.

Additionally, the clumping nature of these grasses provides open spaces at ground level. This gap allows for the movement of songbirds and other wildlife in search of food and provides shelter from predators.

Grasses and meadow ecosystems produce extensive root systems, often manufacturing equal biomass above and below the ground. It is this massive underground root system that allows grasses to regenerate after a burn.

Grasses can be difficult to identify. To become a real expert, you will need to become familiar with the parts of the grass inflorescence (flower) and vegetative structures described in the back of this book.

Finally, these grasses have been chosen for their beautiful display in summer, fall, and winter. By choosing any combination of the eight grasses presented in this chapter, you will be sure to provide plant interest in your meadow, as well as attract animals to delight your spirit.
**Andropogon gerardii**
big bluestem

Big bluestem forms a tall column of grass, standing out as a sentinel among shorter plants. It can also be used as an elevated background plant in other garden settings. This robust, clumping grass has erect, flat, blue-green leaves which turn tan in the fall. The unusual arrangement of the seed heads earn this grass the nickname of “turkeyfoot.” *Andropogon gerardii* is quite pest and disease resistant. Dense roots make this drought-tolerant grass excellent for erosion control.

**Cultural Requirements:**
Prefers full sun in well-drained to clay soils but tolerates a wide range of pH levels from as low as 4 to higher alkaline pHs. Once established, the large, fibrous root system will tolerate drought.

**USDA Hardiness Zone:** 3 - 8

**Ultimate Size:** 4’ to 6’ tall; 2’ to 3’ wide.

**Wildlife Value:**
Host plant to the Cobweb and Delaware Skipper. Attracts other beneficial insects. Birds such as junco, chipping sparrow, and tree sparrow will consume the seeds but not as their first choice. Provides nesting cover and good quality forage.
**Andropogon virginicus**
broom sedge

Broom sedge is the beautiful, reddish-tan grass that one commonly sees on roadside banks in fall and winter. During summer months, broom sedge appears as a nice soft, green, arching clump. This clumping quality is very important in providing wildlife cover from predators and space for wildflowers. As the weather cools, the characteristic fluffy seed awns and reddish-tan color emerge. Deep and spreading fibrous roots make this grass excellent for erosion control.

**Cultural Requirements:**
While it grows best in full-sun, we also use broom sedge along the edges of the woods since it is more tolerant of partial shade than *Schizachyrium scoparium*. It grows best in dry, low-fertility soils but is tolerant of clay soils. Very drought tolerant.

**USDA Hardiness Zone:** 3 - 8

**Ultimate Size:** 1’ to 3’ tall; 1’ wide.

**Wildlife Value:**
Wildlife use this grass for nests and cover. Its seeds are eaten by birds in winter when other food is scarce. Broom sedge provides 5% - 10% of the field sparrow diet and 2% - 5% of the tree sparrow diet. Small mammals graze on this grass.
Deschampsia cespitosa
tufted hair grass

Because tufted hair grass is a cool-season grass, it begins to grow well ahead of the warm-season grasses in the surrounding meadow. It has a unique, stiff, wiry texture. During the growing season, this grass forms a tight globe-shaped clump of rich green leaves 1/4” wide. Later, tall cloud-like blooms, ranging in color from green to gold, rise above the plants. As a cool-season grass, D. cespitosa will bloom much earlier than warm-season grasses. Because of its adaptability to a wide range of light conditions, tufted hair grass makes a great transition plant from meadow to woodland.

Cultural Requirements:
Dry to moist soils in full sun to shade. It is tolerant of heavy soils.

USDA Hardiness Zone: 1 - 7

Ultimate Size: 1’ to 3.5’ tall; 12” to 18” wide.

Wildlife Value:
Good for wildlife cover and grazing.
Eragrostis spectabilis
love grass

This grass is easy to love in the landscape when the spectacular flowers emerge, sending a purple mist over the meadow. If observed earlier in the season, love grass appears as a very coarse clump of ordinary grass. In the late summer to early fall, the emergence of purple, misty flower plumes changes the mood. The haze turns from purple to light tan as they age. These grass inflorescences last a long time in the garden, about three months. Very late in fall, the tan, dry panicles break loose from the rest of the plant and are easily carried around like tumble weeds.

Cultural Requirements:
Tolerant of a wide range of soils. Full sun to partial shade.

USDA Hardiness Zone: 4 - 9

Ultimate Size: 8” to 18” tall and wide.

Wildlife Value:
Grazed by mammals when young. Also eaten by leafhoppers (Flexamia areolata) and caterpillars of the Zabulon Skipper (Poanes zabulon). Seeds of love grass are consumed by game birds and songbirds.
**Muhlenbergia capillaris**  
**hair-awn muhly**

Hair-awn muhly is the showiest of our native grasses. This clumping, warm-season grass forms a three-foot round globe of wiry texture. Beginning in September to October, a pink wispy smoke created by the flower panicles slowly appears over many days until the whole plant is covered in a cotton candy-like haze.

**Wildlife Value:**  
Provides great cover for birds in the winter and seed as a food source.

**Cultural Requirements:**  
Full sun to partial shade.

**USDA Hardiness Zone:** 5 - 9

**Ultimate Size:** 1’ to 3’ tall; 3’ wide.
Little bluestem is one of the most frequently planted grasses in our meadow. This green to blue-green grass also adds finely textured foliage to the garden. The newly emerging leaves can be washed with burgundies, wines, and other colors. In late summer, delicate inflorescences emerge which become conspicuous when back-lit. In the fall, the leaves mature to a russet or tawny-red color, and continue to be of interest throughout the winter by remaining erect, often with snow and ice.

**Cultural Requirements:**
Moist to dry, well-drained soils in full sun. Tolerant of acidic or alkaline soils and drought. Emerges as the days warm above 60° F.

**Wildlife Value:**
Supports multiple species of skippers. Grasshoppers, along with many other insects, feed on the leaves. The seeds produced are an important source of food for small birds. Grazing herbivores also enjoy this grass. Provides wildlife cover.

**Schizachyrium scoparium**
little bluestem

Ultimate Size: 1’ to 4’ tall; 6” to 24” wide.

USDA Hardiness Zone: 3 - 9
Sorghastrum nutans
yellow Indian grass

Yellow Indian grass draws many favorable comments in fall when its golden-plumed seed heads catch people’s attention. This grass reaches up to six-feet tall and can be rather aggressive in some soils, out-competing many other plants. Yellow Indian grass often succeeds in places where other native warm-season grasses fail, including partial shade. Like many of the other native grasses we grow, yellow Indian grass has a dense root system that is excellent for erosion control.

Cultural Requirements:
Will grow in full sun to light shade in moist to dry soils. Flowers stalks are more floppy in the light shade than in full sun. Tolerant of heavy clay soils. Also tolerant of drought once established.

USDA Hardiness Zone: 4 - 9

Ultimate Size: 3’ to 5’ tall and 2’ to 3’ wide.

Wildlife Value:
Yellow Indian grass provides excellent forage for livestock and supports the Pepper and Salt Skipper (Amblyscirtes hegón). It is also an important source of cover for small birds. Provides a nutritious meal for grazers.
**Sporobolus heterolepis**  
*prairie dropseed*

The elegant and refined prairie dropseed is used as a meadow plant, but also makes a fine addition to perennial beds and borders as a specimen plant. Its soft-textured mounds are eye-catching when planted singly and even more so in masses. Long lived, the warm-season *S. heterolepis* has 1/16” wide leaves that form a rounded mass of emerald-green leaves. In the fall, these turn to an apricot, tan or yellow color, quite different from little bluestem and broom sedge. Prairie dropseed prefers dry soils and is quite drought-tolerant.

**Cultural Requirements:**  
Requires moist to dry well-drained soils in full to partial sun.

**USDA Hardiness Zone:** 4 - 8

**Ultimate Size:** 18” tall (the flower stalk grows to 3’ tall) and 3’ wide.

**Wildlife Value:**  
The seeds are an important source of food to many small birds such as sparrows while the foliage is grazed by livestock. Small mammals will use this grass for cover.

*Sporobolus heterolepis in fall*
Another major group of plants in our meadow is wildflowers. They bring cheerful color to the landscape throughout the growing season while providing precious food for insects and animals. Scientifically, both grasses and wildflowers are considered flowering plants. But to the average person, the wind-pollinated inflorescences of grasses don’t resemble the showy, insect-pollinated, daisy-like blooms of a black-eyed Susan. Quite often, when referring to meadow plants you hear people distinguishing between grasses and forbs. Forbs are herbaceous or non-woody flowering plants such as wildflowers. They are often found in grasslands.

In the meadow at Mt. Cuba Center, we have chosen flowers that extend the season of bloom as long as possible. From moss phlox (Phlox subulata) in April to aromatic aster (Symphyotrichum oblongifolium) late in November, meadow plants span the growing season. Part of our mission is to also display a wide range of worthy wildflowers that grow in the Piedmont of the Eastern United States. Currently we have over 90 species and cultivars representing at least 14 plant families. The Asteraceae (Aster family) with daisy-like ray and disk flowers is a frequent plant family found in the forbs of the meadow. The Asclepiadaceae (Milkweed family) feeds the caterpillars of monarchs while the blossoms make a perfect landing pad for nectar hungry butterflies. This diversity of wildflowers has many benefits in a meadow.

Plant health and a diverse food source for multiple insects and mammals are supported where there is a mix of wildflowers. Extreme weather, pests or disease can decimate an area if only a single plant type exists. Greater botanical biodiversity encourages a wealth of creatures that depend on the flora. A diversity of blooms at one time in the growing season provides for a greater assortment of native pollinators. This relationship is so strong that some plants and pollinators have co-evolved. Certain plants require pollinators that behave in a particular manner in order for pollination to occur. And some pollinators have evolved to the point that they are solely dependant upon a specific plant for food or reproduction. Without one, the other can not exist.

Early in the history of our meadow, we purchased native Piedmont species from any nursery carrying them. Now, our emphasis is growing wild-collected seeds (i.e. collected with proper authorization) and propagating plants from this program to incorporate into our meadow. This program allows us to conserve the genetic diversity that exists within the whole Piedmont province and, at the same time, find plants that are useful for gardens. In this chapter, you will find wildflowers that not only bring color to the meadow, but also support a variety of wildlife.
**Asclepias spp.**

milkweeds

In the Piedmont, there are 12 species of *Asclepias* but several are rare. As a whole, *Asclepias* spp. are an excellent example of the specific relationship between insects and plants.

All *Asclepias* contains cardiac glycosides, making them poisonous to most insects, except those adapted to handle this defense mechanism. Monarch butterfly caterpillars are dependant upon milkweeds and must consume their leaves to grow and transform into butterflies. The nectar of *Asclepias* blooms feeds many *Lepidoptera* larvae including *Fritillaries*. Pollen is sought after by bees. Bumble bees are thought to be one of the main pollinators of *Asclepias*.

Many other species of insects depend specifically on *Asclepias* for food and will even display the same orange and black warning coloration found on monarch butterflies.
Asclepias incarnata
swamp milkweed

Swamp milkweed is probably the easiest Asclepias species to grow and is quite fragrant. When in bloom, it is very attractive to butterflies and other pollinators. Like the other milkweed species, it is a very important food source for the Monarch butterfly larvae. Pink to rose-colored blossoms form at the top of a 2’-3’ plant in mid-July. It grows in an expanding clump of many stems. Cultivars are available with variation in color including the white cultivar ‘Ice Ballet’. Despite the common name, swamp milkweed grows nicely in average garden soil.

Cultural Requirements:
Prefers average to moist soils in full sun to partial shade.

USDA hardiness zone: 3 - 9

Ultimate size: 2’-3’

Wildlife Value:
Required food for Monarch butterfly larvae, and is very attractive to other butterflies and native pollinators for its nectar and pollen.
Milkweed species found in Mt. Cuba Center Meadow

**A. exaltata**
*poke milkweed*

Found in moist forests and woodland edges. Blooms occur throughout the upper half of the plant at the nodes and terminals. A distinctive plant with large leaves and dangling clusters of flowers. Grows 2’ to 5’ tall. Zones 3 - 8.

**A. syriaca**
*common milkweed*

This coarse-textured plant grows over 5’ tall and is an aggressive, quick spreader through rhizomes. Tolerant of a wide range of soils and pH’s. It is also fragrant and a great magnet for Monarch butterflies. Zone 3 - 9.

**A. variegata**
*red-ring milkweed*

Typically found in woodlands and forests. The overall white flower has a red ring between the upper and lower part of the flower structure. Blooms in early summer. Grows 1’ - 3’ tall. Zones 4 - 9.
**A. purpurascens**

*purple milkweed*

Requires moist, well-drained soils with at least a half-day of sunlight. It has broad-shaped leaves with a reddish mid vein. Blooms at the end of each stem. Grows to 3’ tall. Zones 3 - 9.

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**A. verticillata**

*whorled milkweed*

Grows much shorter than most milkweeds, reaching only 1 1/2’ - 2’. Requires well-drained soils and is usually found in rocky dry soils. This *Asclepias* species is distinguished by its very narrow leaves. Zones 3 - 9.
Asclepias tuberosa
butterfly weed

Butterfly weed is a beautiful and very drought-tolerant perennial of great ecological importance. All species of Asclepias, including A. tuberosa, are required food for the Monarch butterfly larvae. This long-lived plant grows in erect clumps 24” tall from a large soft-textured, white tap root. From mid-June into July, butterfly weed is covered in large clusters of unusually-shaped blooms of orange to yellow. There is some re-bloom throughout the growing season.

Cultural Requirements:
Prefers well drained, sandy soils in full sun to partial shade, although it will tolerate acid soils and clay, if allowed to dry out. One of the most drought tolerant plants in the meadow.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 1’ to 2’ tall; 2’ to 3’ wide.

Wildlife Value:
Required food for Monarch butterfly larva. Pollen and nectar source for many insects. Many other insects have adapted to consuming this plant.
**Baptisia alba**  
white wild indigo

White wild indigo is an elegant, long-lived perennial that is extremely drought tolerant. It emerges in spring looking like purple-black asparagus spears, then grows into a three-to-four-foot tall, multi-stemmed, shrub-like plant. From mid-May to early June, white terminal flower spikes emerge and contrast beautifully with its smoky-purple stems. The flowers are followed by plump green pea pod shaped seed capsules which turn black later in the summer. It is striking, planted in a flower border as well as in a meadow. A similar plant with blue-purple flowers is *Baptisia australis*.

**Cultural Requirements:**  
Adapted to full or light shade in well-drained moist to dry soils. Tolerant of drought and a wide range of soil pHs.

**USDA Hardiness Zone:** 5 - 9.

**Ultimate Size:** 3’- 4’ tall; 3’- 4’ wide.

**Wildlife Value:**  
This is a host plant to the Eastern Tailed Blue and the Frosted Elfin butterfly. It provides nectar for other butterflies. *Baptisia* species are host to 15 native butterflies and moths. They also provide pollen and nectar for many native bees.
Chrysopsis mariana
Maryland golden-aster

The Maryland golden-aster is a beautiful cheery perennial with a long period of bloom. It is a very drought-tolerant plant and is found in dry habitats and sandy soils. Maryland golden-aster blooms from mid-August to as late as mid-October. It grows to about two feet tall. Chrysopsis mariana is a tidy and clumping plant with rich-green leaves. Since it seems to be a short lived-perennial, be sure to allow a few flowers to go to seed for additional plants. In our meadow, it only lives for five to six years.

Cultural Requirements:
Well-drained soils in full-sun to half a day of sun. Drought tolerant.

USDA Hardiness Zone: 5 - 9

Ultimate Size: 18” to 24” tall; 12” wide.

Wildlife Value:
Little is known of its wildlife value. More research is needed.
Coreopsis verticillata
whorled tickseed

Coreopsis verticillata has long been a favorite in traditional perennial gardens. It is a fine-textured, bright and delightful perennial that thrives in dry situations. It is usually easy to grow and trouble free. It spreads by short rhizomes and if grown in rich garden soil, can spread rapidly. Cultivars are available with different heights and flower colors. Whorled tickseed is a very long blooming perennial that forms a fine textured mound. Length of bloom varies with the species and cultivar, and in general can bloom from late June through September. Two notable cultivars are ‘Zagreb’ and ‘Moonbeam’. The later is noted for its soft-yellow flowers.

Cultural Requirements:
Moist to dry, sandy or well-drained soils in full-sun to partial shade. Tolerant of drought once established.

USDA Hardiness Zone: 4 - 9

Ultimate Size: 1’-2’ tall and spreads

Wildlife Value:
Seeds are eaten by birds, while the nectar is enjoyed by butterflies.
Echinacea purpurea
purple coneflower

Purple coneflowers are probably one of the best known and most popular native perennials and for good reason. They are extremely beautiful, easy to grow, drought and heat tolerant, and make wonderful wildlife plants. Purple coneflower is a marvelous nectar and pollen plant for butterflies and other insects. It is also a fabulous seed source sure to attract birds such as the American Goldfinch. A huge number of cultivars have been introduced in recent years, making a wide range of colors and flower forms available. The species grows about three feet tall and can bloom throughout July and August.

Cultural Requirements:
Full sun to partial shade in average to rocky soils. Prefers regular garden soils but is tolerant of drought once established.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 2’ to 5’ tall; 12” to 18” wide

Wildlife Value:
Seeds are eaten by birds, most notably American Goldfinches and juncos. Nectar and pollen is enjoyed by bees, butterflies, and other pollinators.
**Euthamia caroliniana**

**slender goldentop**

Slender goldentop’s extremely fine texture creates a nice contrast against the larger, bolder foliage of native grasses. In late fall, equally fine textured soft yellow flowers cover the tops of plants. It is a great meadow plant selection due to its long season of textural contrast and its late bloom that extends the blooming season of the meadow. Slender goldentop spreads by fine rhizomes; quickly in fine garden soil, and more slowly in average field soils. It is easily removed when it strays farther than you want. It grows from 30”-36” tall and blooms from mid-to late October.

**Cultural Requirements:**
Will grow in a wide range of soils in full sun.

**USDA Hardiness Zone:** 4 -10

**Ultimate Size:** 30” to 36” tall and spreads

**Wildlife Value:**
Many pollinators, especially bees and wasps, are attracted to this plant.
Joe-Pye weed would be better called Joe-Pye flower. It was named after a native American who showed settlers how to use the plant to fight the effects of typhoid fever. There are four species of Joe-Pye weed in the Appalachian Piedmont, including *E. dubium*, *E. fistulosum*, *E. maculatum*, and *E. purpureum*. All four species and the many cultivars are excellent butterfly attractors in August. There are a number of fine cultivars available with different colors and heights such as ‘Little Joe’, ‘Baby Joe’, ‘Little Red’, ‘Big Umbrella’, ‘Gateway’, ‘Atropurpureum’ and ‘Bartered Bride,’ to name a few.

**Cultural Requirements:**
Tolerates full to partial sun in moist to dry soils; this plant is drought-tolerant once established.

**USDA Hardiness Zone:** 3 - 9

**Ultimate Size:** 3’ to 12’ tall; 2’ to 4’ wide.

**Wildlife Value:**
Supports over 40 species of butterflies and moths. Swallowtails and native bees are particularly drawn to the flowers. Many other beneficial insects are also supported and some migratory birds will utilize this plant.
This perennial is the last of the sunflowers to bloom, bringing rays of sunshine into your garden very late in the season. *H. angustifolius* has tall stems with narrow, glossy, almost succulent-like dark-green leaves. They grow about six feet tall and bloom in October until frost. The cultivar ‘Gold Lace’ is a typical bright yellow and shows well from a distance, while the cultivar ‘Mellow Yellow’ is a beautiful soft yellow.

**Cultural Requirements:**
Grows in a wide range of soils from moist to dry. Tolerant of a wide range of pHs from 4.0 - 7.0.

**USDA Hardiness Zone:** 5 - 9

**Ultimate Size:** 5’ to 7’ tall; 2’ wide

**Wildlife Value:**
Leaves are food for the Silvery Checkerspot, Bordered Patch butterfly larvae, and Painted Ladies among others. American Goldfinch and many other small birds and mammals will eat the seeds.
**Liatris pilosa var. pilosa**  
grass-leaf blazing-star

Grass-leaf blazing-star is a more delicate variation on *Liatris spicata*. It grows to 24” and produces a slender wand of flowers. It makes a graceful appearance in a meadow planted among native grasses such as little bluestem and broom sedge. It will seed in at a modest rate and naturalizes beautifully. It blooms over a long period of time, from mid-August to mid-October.

**Cultural Requirements:**  
Grows in a wide range of soils in full sun.  
USDA Hardiness Zone:  5 - 9

**Ultimate Size:** 24” tall

**Wildlife Value:**  
Attracts a wide range of butterflies and other pollinators.
Liatris spicata
spike gayfeather

Also known as dense blazing star, spike gayfeather is the first to bloom in the Liatris group. In mid-summer, tall spikes emerge with blossoms that bloom at the top first, progressing down to the bottom. These spikes are densely covered in purple blooms. The species can grow three feet tall and blooms for about three weeks in mid-July. It is often used in floral arrangements. Many other beautiful species of Liatris are available like L. pilosa and L. microcephala.

Cultural Requirements:
Moist to wet soils in full sun to partial shade. Will tolerate average soils. Best suited to soils with a pH between 5.6 - 7.5.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 2’ to 5’ tall which includes the flower stalk; 18” wide.

Wildlife Value:
Bees, butterflies and other beneficial insects are attracted to this plant for its nectar.
Lobelia cardinalis
cardinal flower

Excellent when viewed from afar, or up close in a border, the cardinal flower with its vibrant crimson blooms will surely catch anyone’s attention. Many cultivars are available with a wide range of color choices for flowers and foliage. Plants can be short lived. Since they seed in, make sure to leave a few flower heads to replenish your display.

Cultural Requirements:
Moist to wet soils, especially when planted in full sun. Partial shade is better when planted in drier sites. Supplement with water during drought.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 2’ to 4’ tall; 4” to 8” wide.

Wildlife Value:
One of the best plants to attract hummingbirds. Also very enticing to butterflies and other pollinators.
Monarda didyma
scarlet bee balm

The Oswego Indians and early American settlers made tea from this plant and thus the other common name Oswego tea. Its bright unusual flowers look like a vibrant joker’s hat. Many Monarda cultivars are hybrids between several native species. A very successful red form, Monarda ‘Jacob Cline’, is one of the most mildew-resistant cultivars. Scarlet bee balm grows to 4’ tall and blooms from late June through most of July. Bloom times can be extended with deadheading.

Cultural Requirements:
Best in moist, loamy, fertile soils with a pH less than 6.8. Enjoys full sun to partial shade.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 1’ to 6’ tall; 2’ to 3’ wide.

Wildlife Value:
A good mid-season flower to draw in hummingbirds. Also very attractive to butterflies and other pollinators, including Sphinx moths.
**Monarda fistulosa**  
**wild bergamot**

*Monarda fistulosa*, a species which tolerates drier sites, has flowers very similar to *M. didyma* but in a lavender-purple color. It has been widely cultivated, and selections for shorter forms, mildew resistance, and other colors can be found. Some fine selections are ‘Claire Grace’ (pink), ‘Coral Reef’ and ‘Judith’s Fancy Fuchsia’. *M.’Claire Grace’* grows to 4’ tall and blooms most of July through August. Bloom time is extended with deadheading. Many *Monarda* cultivars are hybrids between several native species.

**Cultural Requirements:**  
Prefers full sun and well drained soils but will tolerate clay. Drought tolerant

**USDA Hardiness Zone:** 3 - 9  
**Ultimate Size:** 4’ tall; spreads

**Wildlife Value:**  
Attracts hummingbirds, hummingbird moths, and other pollinators.
Packera anonyma
Small’s ragwort

Small’s ragwort is a cheery, early blooming meadow flower. Clusters of 20-100 tiny bright-yellow daisy-like flowers are borne atop a 30” long stem. This flowering stem rises from a basal rosette of intricately-cut, rich-green leaves. Small’s ragwort blooms from mid-May to June, and it seeds in at a moderate rate. It is especially valuable in the meadow because of its early flowering time.

Cultural Requirements:
Grows in full sun in dry fields and open woods. Will tolerate clay.

Wildlife Value:
Attracts many pollinators.

Ultimate Size: 30” tall including the flower stalk; 12” wide

USDA Hardiness Zone: 6 - 9
Penstemon digitalis
foxglove beardtongue

Appearing relatively early in the meadow blooming season, the beautiful, but unusually-structured white flowers rise on a stalk above glossy green leaves. The flowers’ size and the arrangement of its stamens perfectly fit the bumblebees that visit. Foxglove beardtongue makes a splendid show of white, both up close and at a distance. It grows up to 4 1/2’ tall, blooms in June, and is commonly found in meadows, old fields, and roadsides. The burgundy-leaved cultivar ‘Husker Red’ is widely available.

Cultural Requirements:
Grows in a wide range of soils in full sun to partial shade.

USDA Hardiness Zone: 3 - 9

Ultimate Size: 2’ to 4 1/2’ tall (taller in rich soil); 12” wide

Wildlife Value:
It is pollinated by bumblebees and other insects.
Phlox pilosa
donny phlox

Thanks to its early blossoms, downy phlox will delight any gardener when placed near the front of a border or within a meadow. This low growing, herbaceous perennial slowly creeps through the garden by rhizomes and can seed in over time. Flower color is pink to lavender and, rarely, white. Five-petaled flowers bloom on one-foot-tall plants from mid-May to mid-June. It can be quite fragrant! It is rare in nature where it occurs in moist meadows and roadsides.

Cultural Requirements:
Moist to moderately dry soils in full sun to partial shade.

USDA Hardiness Zone: 4 - 9

Ultimate Size: 1’ tall; spreads

Wildlife Value:
Invaluable as an early butterfly and hummingbird nectar source.
**Physostegia virginiana**

**obedient-plant**

This easy-to-grow perennial has many uses, from naturalizing in meadows to indoor flower arrangements. The common name comes from the fact that each flower may be moved from side to side, then stays where it is put, as if wired on the stem. Naturally found with purplish-pink blooms, cultivars come in various shades including white. The species blooms July into August. Cultivars are available with different heights, colors, and bloom times. The plant tends to spread quickly through loose, loamy soils and slower in heavy clay soils. It is easily divided, or cut back underground with a spade to control its spreading roots. The cultivar ‘Vivid’ grows to two feet tall and blooms September to October.

**Cultural Requirements:**
Grows best in full sun with moist to moderately dry soils. Divide in spring to reduce the size.

**USDA Hardiness Zone:** 3 - 9

**Ultimate Size:** 3’ to 4’ tall; spreads

**Wildlife Value:**
Attracts butterflies, long-tongued bees and ruby-throated hummingbirds.
**Rudbeckia fulgida**
black-eyed Susan

*Rudbeckia fulgida* thrives in the full sun of a meadow or as a sweeping drift in a border. It is a very reliable clumping perennial and combines beautifully with other grasses and perennials. From late August to mid-October, showy, orange-yellow blooms emerge. These striking flowers are about 2” to 3” across and have purple-black disk florets, thus the name black-eyed Susan. Insects find this an attractive landing pad. Many cultivars and varieties are available thanks to the high variability found in nature. It grows to three feet tall with nice clean foliage. It closely follows the bloom time of *Rudbeckia hirta*, a close relative that is an annual or biennial. It spreads moderately by seed.

**Cultural Requirements:**
Will grow in full sun to partial shade, and in a wide range of soils including clay.

**USDA Hardiness Zone:**  3 - 9

**Ultimate Size:**  2’ to 3’ tall; 18” wide

**Wildlife Value:**
Nectar is attractive to bees and butterflies; 17 species of butterflies and moths use the *Rudbeckia* genus as food. Seeds will be eaten by American Goldfinches and other small birds.
**Solidago odora**
sweet goldenrod

Sweet goldenrod is an early blooming goldenrod that mixes nicely with butterfly weed and purple coneflowers, either in the meadow or the garden. Smooth dark-green leaves smell like anise when torn, which is the plant’s most identifiable feature. In mid-to late summer, earlier than most goldenrods, small yellow flowers form bright clusters. Native Americans made a tea from this plant. Goldenrods have long been misunderstood as many think they cause allergies or hayfever. The actual culprit is ragweed, (*Ambrosia* spp.) which blooms at the same time. Goldenrod has sticky pollen whereas the pollen of ragweed is wind-blown.

**Cultural Requirements:**
Will grow in full sun to partial shade in moist to dry soils of an average to sandy texture.

**USDA Hardiness Zone:** 4 - 9

**Ultimate Size:** 2’ to 6’ tall; 1’ wide

**Wildlife Value:**
Goldenrods support 115 species of butterflies and moths making them a wildlife powerhouse! Many native birds will eat goldenrod seeds so leave some up for winter.
**Solidago rugosa ‘Fireworks’**

Fireworks wrinkle-leaf goldenrod is characterized by great, long, arching racemes of flowers. It grows 3’ to 4’ tall and blooms from September to early October. The species *Solidago rugosa* is a moderately aggressive spreading goldenrod with typical goldenrod flowers. The cultivar ‘Fireworks’ still spreads underground at a moderate rate and can be controlled by cutting back with a sharp spade. It works well as a perennial border feature or mixed among native grasses in a meadow.

**Cultural Requirements:**
Moist to dry well-drained soils in full sun to partial shade are preferred. A pH between 5.0 and 7.5 is best. Drought tolerant once established.

**USDA Hardiness Zone:** 3 - 9

**Ultimate Size:** 2’ to 4’ tall; 3’ wide

**Wildlife Value:**
Butterflies and many other pollinators are attracted to goldenrods for their nectar. Additionally, their seeds supply food for many native birds.
**Solidago speciosa**  
**showy goldenrod**

This goldenrod is the most elegant of all the goldenrods. In late summer, soft, pale-yellow, candlestick-shaped blooms rise above rich, deep-green foliage. Also unlike many other goldenrods, the blooms of the showy goldenrod remain straight and upright, not bending over or arching. Showy goldenrod is a very long-lived reliable perennial. Many stems rise from the base and the plant spreads slowly by seed. It grows 3’- 5’ tall and blooms from mid-September to mid-October.

**Cultural Requirements:**
Grows well in average soils in full sun. Drought tolerant once established.

**Wildlife Value:**
Goldenrods support many species of butterflies, moths and birds.

**Ultimate Size:** 3’ to 5’ tall; 1’ wide

**USDA Hardiness Zone:** 3 to 9
**Spigelia marilandica**  
**Indian pink**

Indian pink is a neat, clump-forming perennial with bright, eye-catching blooms. Outstanding red tubular flowers burst open like a firecracker revealing yellow to yellowish-green pointed petals. Once the seeds have matured, they self-sow by almost “exploding” away from the parent plant. Indian pink is very adaptable to a wide variety of soils and light conditions. It is a long-lived perennial that forms an expanding cluster of stems. The main bloom period is in June with sporadic re-bloom throughout the growing season right up to frost.

**Cultural Requirements:**
A wide range of soils and light conditions are tolerated. Will tolerate moist to dry conditions.

**USDA Hardiness Zone:** 6 - 9

**Ultimate Size:** 1’ to 2’ tall; 1’ wide or less

**Wildlife Value:**
Attracts hummingbirds.
Stokesia laevis
Stokes’ aster

Stokes’ aster is a beautiful, long-lived perennial that blooms prolifically for an expanded period in the heat of summer. *Stokesia laevis* is a clumping plant. In late June through July, pale buds covered in soft prickly thorns appear, which develop into beautifully fringed blooms up to 3” across. Although the species is typically a shade of blue-purple, cultivars now exist with colors ranging from deep purple to white and even a creamy yellow. The cultivar ‘Peachie’s Pick’ has a more upright form and longer period of bloom. The species grows about 18” tall.

**Cultural Requirements:**
Grows in full sun to partial shade. While it prefers light, well-drained soil, it will tolerate clay soil.

**USDA Hardiness Zone:** 5 - 9

**Ultimate Size:** 1’ to 2’ tall (with blooms); 1’ wide

**Wildlife Value:**
Attractive to butterflies due to its nectar. Also attracts many other pollinators.
Symphyotrichum georgianum
Georgia aster

While the Georgia aster comes from the southern Piedmont of the Carolinas and Georgia, it grows beautifully here at Mt. Cuba Center. It is one of the last plants to bloom in the fall, along with aromatic aster and swamp sunflower. Its deep violet color and narrow flower petals makes it stand out in our fall garden. In nature it is found in rocky woodlands, woodland edges and even power line cuts. Georgia aster grows with many upright stems in a 3’ to 4’ tall clump. It spreads at a moderate rate by rhizomes and is easily controlled by dividing or cutting off unwanted sections with a sharp spade.

**Cultural Requirements:**
Grows in full sun to partial shade, water lightly during drought.

**USDA Hardiness Zone:** 6 - 9

**Ultimate size:** 3’ to 4’ tall; spreads

**Wildlife Value:**
Attracts butterflies and many other pollinators.
Symphyotrichum laeve var. laeve ‘Bluebird’
Bluebird smooth aster

This plant ranked as the best overall aster in a Mt. Cuba Center aster study completed in 2006. Bluebird smooth aster has long been known for its beauty and reliability. It has a neat habit, stays in a clump and rarely requires staking. The bluish-green foliage is clean and attractive with a slightly glossy appearance. Violet-blue flowers appear in late September through October. It mixes beautifully with Rudbeckia fulgida, Helianthus angustifolius, and other fall-blooming perennials. Bluebird smooth aster is one of Mt. Cuba Center’s plant introductions.

Cultural Requirements:
Thrives in full-sun to light shade. Tolerates a broad range of soil types and moisture levels, and is drought tolerant once established.

USDA Hardiness Zone: 3 - 8

Ultimate Size: 2’ to 4’ tall; 18” wide.

Wildlife Value:
This is a larval host to the Pearl Crescent butterfly and it attracts many other pollinators.
**Symphyotrichum novae-angliae**  
**New England aster**

New England aster is one of the earliest native asters to bloom in the meadow. It has been cultivated for many years and there are a number of richly-colored cultivars from white, pink, red to deep purple. It is a long-lived and tough perennial, found in meadows and the edge of woods. It is a fine garden subject for both perennial borders and meadow plantings. It grows to 5’ tall and blooms in September and October.

**Cultural Requirements:**  
Grows in full sun to partial shade. Prefers moist soils.

**USDA Hardiness Zone:** 3 - 9

**Ultimate size:** 3’ to 5’ tall (with flowers); 2’ wide

**Wildlife Value:**  
Attracts butterflies and many other pollinators.
**Symphyotrichum oblongifolium**  
**aromatic aster**

This low-growing aster is a great addition to the front of any border or meadow edge. The rigid, blue-green leaves, as the common name suggests, have an herbal scent when crushed. In late September and even into November, the violet-blue ray florets with yellow discs emerge to form beautiful solid mounds of flowers. Its late bloom period often gives the meadow the last show of the season. The straight species, and cultivars ‘October Skies’ and ‘Raydon’s Favorite’, are all great choices.

**Cultural Requirements:**  
Grows in full sun to partial shade, easy to grow, and pest resistant.

**USDA Hardiness Zone:** 3 - 8

**Ultimate Size:** 1 1/2’ to 2’ tall and up to 3’ or more wide.

**Wildlife Value:**  
Attracts butterflies and many other pollinators.
**Vernonia angustifolia**

* Narrow-leaf ironweed

Narrow-leaf ironweed is likely the most promising garden perennial ironweed because of its fine ornamental foliage in addition to its deep violet flowers. This ironweed blooms in mid-September atop 3’ to 5’ tall, finely textured foliage. It is quite drought tolerant. In comparison to *V. noveboracensis*, narrow-leaf ironweed has a more delicate appearance and broader shrub-like growth.

**Cultural Requirements:**
It thrives in well-drained, low-nutrient soils, in full sun to partial shade.

**Wildlife Value:**
This plant is loved by butterflies and other pollinators.

**Ultimate Size:** 3’ to 5’ tall and wide

**USDA Hardiness Zone:** 6 - 9
New York ironweed is a tall native plant with deep-violet flowers often seen along roads in wet low lying areas. It is a tough, but beautiful plant that is very attractive to butterflies and other pollinators. It can grow to 6'-7' tall. Here at Mt. Cuba Center, we have found that, once established, it can also grow in upland areas with lower moisture levels. It is very drought tolerant and long lived. There are several other species of interest that all have similar fine-petaled, deep-violet flowers. *Vernonia glauca* is an uncommon native called upland ironweed because it is normally found in upland sites.

**Cultural Requirements:**
A lover of full sun, this plant will be happy in soils ranging from wet to dry, although most species will be shorter when grown in dry conditions.

**USDA Hardiness Zone:** 4 - 9

**Ultimate Size:** 3’-7’ tall; 1’ wide.

**Wildlife Value:**
A favorite of butterflies, native bees and other pollinators.
Plants for Wet Sites

While many of these plants have a wide range of moisture tolerance, the following lists those that do well in a moist to wet meadow. These plants are also excellent candidates for the rain garden.

Andropogon gerardii
Andropogon glomeratus
Asclepias incarnata
Asclepias purpurascens
Conoclinium coelestinum
Eutrochium spp.
Gentiana clausa, G. saponaria
Helianthemum autumnale
Helianthus angustifolius
Liatris spicata
Lilium canadense
Lobelia cardinalis
Monarda didyma
Phlox maculata
Physostegia virginiana
Rudbeckia fulgida
Senna hebecarpa
Sorghastrum nutans
Symphyotrichum novae-angliae
Vernonia noveboracensis
Veronicastrum virginicum

Plants for Dry Sites

Allium cernuum
Asclepias tuberosa, A. purpurascens, A. syriaca, A. verticillata
Andropogon virginicus
Baptisia alba, B. australis
Chrysopsis mariana
Coreopsis verticillata
Deschampsia cespitosa
Echinacea purpurea
Eragrostis spectabilis
Eupatorium hyssopifolium
Euthamia caroliniana
Eutrochium spp.
Helianthus angustifolius
Liatris pilosa var. pilosa
Liatris microcephala
Monarda fistulosa
Muhlenbergia capillaris
Packera anoma
Penstemon digitalis
Phlox pilosa
Phlox subulata
Rosa carolina
Rudbeckia fulgida
Senna hebecarpa
Schizachyrium scoparium
Solidago odora, S. odora ‘Fireworks’, S. speciosa
Sorghastrum nutans
Sporobolus heterolepis
Symphyotrichum concolor
Symphyotrichum oblongifolium
Thermopsis villosa
Vernonia acaulis
Vernonia angustifolia
Vernonia glauca
**Glossary**

**Annual** - A plant that completes its life cycle in a single year or growing season.

**Awn** - A substantial hair or bristle that terminates a plant part such as a bract, glume, or seed.

**Beneficial insects** - Insects that are considered beneficial to an ecosystem. Typically they either prey on plant pests or pollinate plants. Insects are also beneficial because they are an excellent food source for a wide variety of animals (e.g. moth and butterfly larvae are important sources of protein for birds feeding their young).

**Biennial** - A plant that completes its life cycle in two years or growing seasons. During the first season, foliage is produced, then flowers and seeds in the next.

**Clumping** - A type of growth habit with many stems packed densely together.

**Cool season grasses** - Grasses that actively grow under cool conditions in the spring and fall with optimum growth temperatures between 60° and 80° F. They stay green during winter months and go dormant under warm conditions, turning brown. Many cool season grasses are referred to as C3 grasses because they produce chlorophyll using a specialized pathway originating with sugars comprised of 3-carbon atoms.

**Cultivar** - A cultivated variety or strain of a plant selected for specific favorable characteristics that persist when reproduced sexually or vegetatively.

**Deadheading** - The process of removing spent blossoms before seed is produced. This helps maintain a tidy appearance to the plant, encourages re-blooming, and reduces the unintentional propagation of the plant.

**Diabase barrens** - An area where the soil is formed from an underlying foundation of diabase bedrock and is characterized by high levels of magnesium and a nearly neutral pH.

**Grasslands** - An area where the predominant vegetation consists of grasses.

**Heavy soils** - Soils that contain high levels of clay.

**Inflorescence** - A flowering stalk or seed head.

**Meadow** - An old English term for a grassy area where the predominant vegetation consists of grasses.

**Old field** - An abandoned agricultural field.

**Panicle** - A branched inflorescence.

**Perennial** - A plant that lives for two years or more generating foliage and stems from the
Glossary

previous year’s stem/root system.

**Piedmont** – A geographic area lying between the Coastal Plain and the Appalachian Mountains characterized by rolling hills, rivers and streams, and a rich diversity of plants. It extends from New York to Alabama.

**Pollinators** – Animals, such as insects, that pollinate flowers. Bumblebees are considered among the best insect pollinators.

**Prairie** – A word derived from French describing a large area that consists mostly of grasses; often used to refer to the large grasslands of the central United States.

**Raceme** – An unbranched, typically elongated, inflorescence or seed head where the flowers are produced on short stalks along the main flowering stem.

**Rhizome** – An underground, usually horizontal, stem that produces roots and shoots at various intervals.

**Rhizomatous** – Producing rhizomes.

**Savanna** – Grasslands scattered with trees, or groups of trees, where only a small percentage of the area is composed of trees; typically found in the southeastern United States.

**Seed capsules** – Dried fruiting structures containing seeds.

**Serpentine barrens** – An area where the soil is formed from an underlying foundation of serpentine bedrock. The soil tends to be thin and gritty and is characterized by high levels of magnesium, chrome and nickel. Although few plants tolerate these conditions, species have evolved that can thrive in these challenging soils.

**Shale barrens** – An area where the soil is formed from an underlying foundation of shale deposits. Soils tend to be thin, gritty and dry.

**Succession** – A process of change whereby plant and animal communities evolve over time.

**Sun exposure** – The direction, duration, and degree of sunlight a plant is exposed to.

**Warm season grasses** – Grasses that actively grow in the spring and summer with optimum growth temperatures between 85° and 95° F. They turn brown in the fall and go dormant under cool to cold conditions. Many warm season grasses are drought tolerant and are referred to as C4 grasses. C4 grasses produce chlorophyll through a specialized pathway originating with sugars comprised of 4-carbon atoms.

**Woodland** – An area dominated by trees, along with shrubs, other woody plants, and an understory of herbaceous plants.
Parts of a grass plant

Used by permission and with sincere thanks to Dr. Craig A. Harper, author of Native Warm-Season Grasses.
Recommended Reading


Recommended Reading; Continued


Recommended Websites

http://www.alabamaplants.com/
*Alabama Plants.com* – Great site for detailed plant photographs by Dan Tenaglia

http://bna.birds.cornell.edu/bna/
The *Birds of North America Online* – Detailed and up-to-date information about birds including preferred habitat and food.

http://bringingnaturehome.net/
*Bringing Nature Home* – Website of Dr. Douglas Tallamy where he makes a case for native gardening and its relevance to native insects.

http://www.bugoftheweek.com/
*Bug of the Week Website* – Up-to-date articles on insects of concern, insect-related news, and other interesting entries by entomologist Dr. Michael Raupp from the University of Maryland.

http://bugguide.net/node/view/15740
*Bug Guide* – Identification, images, and information on insects, spiders and their kin. For the United States and Canada.

http://www.butterfliesandmoths.org/
*Butterflies and Moths of North America* – Collecting and sharing data about Lepidoptera.
www.wildflower.org
Lady Bird Johnson Wildflower Center – Native plant database and more.

www.missouribotanicalgarden.org
Missouri Botanical Garden – Extensive plant information including comprehensive databases.

http://www.missouriplants.com/
Missouri Plants.com – Another great site for detailed plant photographs by Dan Tenaglia.

http://web4.audubon.org/bird/at_home/HealthyYard_Create.html#
National Audubon Society – Information on birds, butterflies, plants and habitats.

http://ncbg.unc.edu/
North Carolina Botanical Garden – Educational resources, articles and publications related to conservation, plants and gardening.

http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/index.html
North Carolina Cooperative Extension Service – Numerous plant fact sheets.

http://www.paflora.org/
The Pennsylvania Flora project of Morris Arboretum – Species checklist and fact sheets about plants and invasive plants found in Pennsylvania.

http://www.pollinator.org/
Pollinator Partnership and the North American Pollinator Protection Campaign – A source for pollinator action, information and resources.

http://ag.udel.edu/udbg/gardens/native.html
University of Delaware Botanic Garden – The Native Garden at the University of Delaware and its Lepidoptera Trail includes a plant list by Dr. Doug Tallamy.

http://www.herbarium.unc.edu/flora.htm
The University of North Carolina Herbarium – Online version of Alan Weakley’s Flora of the Southern and Mid-Atlantic States.

http://fwf.ag.utk.edu/personnel/charper/succesionmgmt.htm
University of Tennessee Center for Grassland Management – Website of Dr. Craig Harper which includes links for articles, manuals and publications on grassland management.

http://plants.usda.gov/java
The USDA Natural Resources Conservation Service – Multiple plant-related databases, articles and links.

http://www.xerces.org/
The Xerces Society – Publications, programs and news about insects and other invertebrates.
This is by no means an exhaustive list of seed and plant suppliers, rather it is a sharing of the sources we have used over the years.

**Brandywine Conservancy**  
Routes 1 and 100, P.O. Box 141  
Chadds Ford, PA 19317  
(610) 388-2700  
[www.brandywinemuseum.org/gardens.html](http://www.brandywinemuseum.org/gardens.html)  
Source of locally collected seeds

**Ernst Conservation Seeds**  
9006 Mercer Pike  
Meadville, PA 16350  
(800) 873-3321  
[www.ernstseed.com](http://www.ernstseed.com)  
Source of regionally collected seeds

**Groff’s Plant Farm**  
6128 Street Road  
Kirkwood, PA 17536  
(717) 529-2249  
[www.groffsplantfarm.com](http://www.groffsplantfarm.com)  
Annuals, perennials, shrubs  
Seasonal retail shop

**Hoffman Nursery**  
5520 Bahama Rd.  
Rougemont, NC  
(919) 479-6620  
[www.hoffmannursery.com/](http://www.hoffmannursery.com/)  
Ornamental and native grasses  
Wholesale only, source for plant plugs

**Nearly Native Nursery**  
776 McBride Road  
Fayetteville, GA 30215  
(770) 460-6284  
[www.nearlynativenursery.com](http://www.nearlynativenursery.com)  
Southeastern trees, shrubs, perennials  
Retail shop and mail-order, a source for Georgia aster

**New Moon Nursery, LLC**  
975 Barretts Run Road  
Bridgeton, NJ 08302  
(888) 998-1951  
[www.NewMoonNursery.com](http://www.NewMoonNursery.com)  
Perennials, grasses, aquatics, ferns  
Wholesale only, source for plant plugs

**North Creek Nurseries, Inc.**  
388 North Creek Road  
Landenberg, PA 19350  
(610) 255-0100  
[www.northcreeknurseries.com/](http://www.northcreeknurseries.com/)  
Native perennials, grasses, ferns, woodies  
Wholesale only, source for plant plugs

**Prairie Moon Nursery**  
Route 3, Box 163  
Winona, MN 55987  
(507) 452-1362  
[www.prairiemoonnursery.com](http://www.prairiemoonnursery.com)  
Native plants and seeds  
Wholesale and retail mail-order

**Prairie Nursery**  
PO Box 306  
Westfield, WI 53964  
[www.prairienuyres.com/store/](http://www.prairienuyres.com/store/)  
(800) 476-9453  
Native plants and seeds  
Wholesale and retail mail-order

**Sunlight Gardens**  
174 Golden Lane  
Andersonville, TN 37705  
(800) 272-7396  
[www.sunlightgardens.com](http://www.sunlightgardens.com)  
Eastern native perennials  
Retail mail-order
Dave Korbonits

Dave is the Meadow Horticulturist at Mt. Cuba Center, a post he has held for over 21 years. Before joining Mt. Cuba Center, he was the head gardener for Mrs. Donald F. Carpenter. Additionally, he holds a Certificate of Merit from Longwood Gardens, a B.S. from Rochester Institute of Technology, and a M.F.A. from Cranbrook Academy of Art in Bloomfield Hills, Michigan. Dave has a great interest in the interaction of native plants and the wildlife dependant upon them. He teaches regularly at Mt. Cuba Center about meadow gardening and has lectured on this topic at conferences.

Julia Lo Ehrhardt

Julia is the Director of Visitor Experience for Mt. Cuba Center. Her previous positions include Assistant Director at Baywood Greens, Horticulturist at Longwood Gardens, and Director of the School of Professional Horticulture at the New York Botanic Garden. Julia has been a Mt. Cuba Center staff member since 2007.