Chapter 10

Herbaceous Landscape Plants

Learning Objectives
1. Discuss how to grow herbaceous plants
2. State the basic requirements of herbaceous plants
3. Demonstrate how to design gardens with herbaceous plants
4. Describe the growing cycles of herbaceous plants
5. Describe aspects of specialty gardening
Herbaceous Landscape Plants

Herbaceous plants are annuals, biennials, tender perennials or semi-woody perennials. They typically have succulent or tender stems and green leaves. Often, tops of herbaceous plants die back to the ground each winter and new stems grow from the roots each spring. Gardening with herbaceous plants in Tennessee can be rewarding and challenging for both the beginner and the advanced gardener. Few people are blessed with the perfect gardening conditions. Most sites provide an average soil, and in Tennessee, most soils are clay with a mixture of sunny and shady areas. A well-planned garden should reflect the type of soil, the moisture and the lighting conditions of the site for peak performance. Additionally, while trees and shrubs provide the “bones” of a garden, herbaceous plants are compliments to the bones. That being stated, a garden should feature plants that not only look good when combined, but also that grow together compatibly.

The pleasures a flower garden brings are endless. Colorful blooms and foliage combined with interesting textures are a creative expression that is unique to each gardener. Gardening gives the opportunity to show off nature’s palette. Flower gardens can make an entrance welcoming, embellish the front of the home, enhance structures such as fences and lamp posts, frame a lovely view, dress up the back yard, add fragrance, and invite wildlife into the landscape. A combination of annuals, biennials and perennials can transform the garden into a mass display of color and multi-season interest.

Part of the enjoyment of a flower garden is taking care of it. Careful preparation is the key to eliminating some of the hard work and increasing the pleasure of gardening. Any site can become a splendid garden with a little knowledge and some effort. The information in this chapter will provide the basics for growing a successful and beautiful flower garden.

Lifecycles of Herbaceous Plants

Herbaceous plants can provide a non-stop show of color throughout the growing season and can be quite dramatic when used in mass. Annuals can add a lot of “punch” to a garden and can be changed with the seasons to provide continual interest. Biennials and perennials are the mainstay of any flower garden. Perennials return year after year and contribute striking foliage color, texture and sometimes fragrance to the garden long after their flowers have faded. In fact, many herbaceous plants are valued for their eye-catching foliage alone. For detailed information on annuals, biennials and perennials please refer to the Chapter 2, Horticulture.

Site Selection and Preparation

Site selection is one of the most important components in a successful garden; therefore, it should be given careful consideration. The shape, size and position of the site play important roles in the type of plants that can be placed in the garden or landscape.

Personal tastes and property will, in part, dictate the site. However, there are different styles of herbaceous gardens to consider when locating a site. These styles include borders and island beds. A border garden is viewed from one side and is usually installed against a fence, wall, hedge or permanent structure that acts as a background. An island bed is usually planted in the middle of a lawn.

After a site is chosen, the area for the garden should be marked off. This can be done using a can of spray paint, a rope or a hose. Lines should be arranged until a desirable shape is created. Lines can be curved, angled or straight, depending on the gardener’s taste. For more details on creating line, see Chapter 15, Landscape Design.

If drainage problems or tree roots exist at the garden site, suggest doing a raised bed. Raised beds can improve drainage and soil aeration in areas that are difficult to plant or maintain.
Sun-Loving Plants

Sun-loving plants need at least 6 hours of sun each day to realize their full potential. They can take less, but the result will be poor flowering, stretched-leggy growth and weak stems. Also, there are some plants that do well in full-sun, but cannot tolerate the southern heat. These plants can be helped by giving them morning sun and afternoon shade or filtered sun all day.

Although gardening in full shade can be an enormous challenge for the gardener who wants a lot of bright colors all season long, most plants are sun tolerant. If fact, many shade tolerant plants will do fine with more sun, but they are just able to tolerate shade.

Light

After selecting the site, the next step is to determine whether the site has sun, shade or something in between. The light exposure the site receives will dictate the plants that can be used. Most annuals and perennials require full sun to realize their flowering potential. A variety of annuals, biennials and perennials do well in part shade or light shade; however, the plant palette is limited for plants that thrive in full shade.

Soil

After choosing the site and determining its sun exposure, it is necessary to evaluate the soil. Soil is arguably the most important element to a successful garden or landscape. If the soil is poor, the garden plants will most likely perform poorly. Plants cannot reach their full potential in compacted or poorly drained soils. A soil that is well-drained and rich in organic matter is ideal and will allow plants to reach their full potential, provided other growing conditions are favorable.

Before planting, it is necessary to remove or kill all vegetation from the site. Vegetation can be removed manually by using a spade or a power sod stripper, it can be killed by covering the area with a material that is impervious to light or it can be killed chemically by using a non-selective herbicide. If a gardener decides to use a chemical, make sure they follow the directions provided on the label. Existing grass should not be tilled into the soil because the grass roots can return as weeds.

Once the site is free of all vegetative growth, soil pH and nutrient content should be checked. At this point, the website for the Soil, Plant and Pest Center should be visited so that the proper soil test documentation can be printed and sent with the soil sample. This website can be found in the Resources section of this chapter. The results will provide instructions on what, if anything, should be added to the soil. After reviewing the test results, soil should be tilled and any large rocks, roots or foreign objects should be removed. Next, the recommended fertilizers or soil amend-

### Table 1. Classification of Garden Exposures

<table>
<thead>
<tr>
<th>Plant Sun Exposure</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Sun (Full sun)</strong></td>
<td>In order to be considered a full sun location, a site must receive at least six hours of direct sun per day.</td>
</tr>
<tr>
<td><strong>Part shade</strong></td>
<td>Part shade is identified as semi-shade or half shade. The garden receives full sun part of the day and full shade part of the day.</td>
</tr>
<tr>
<td><strong>Light shade</strong></td>
<td>Light shade can be thought of as moving shade or dappled shade. Light shade is the shade we often associate with the light found under deciduous trees where the sun is filtered.</td>
</tr>
<tr>
<td><strong>Full shade</strong></td>
<td>Full shade is probably the most easily understood of all the light designations. When direct sunlight never touches a plant’s leaves, the plant is in full shade.</td>
</tr>
</tbody>
</table>
ments from the soil test should be added, and then the site should be tilled again. After the second tilling, it is highly beneficial to add 2 to 3-inches of organic matter to the soil. Ideally, soil should be 16 percent organic matter. However, added organic matter should not exceed 1/3 of the tilling depth. This is because it would alter the nutrient holding capacity of the soil. Composted grass clippings, leaves and peat moss are great sources of organic matter.

**Spacing**

After the site preparation is complete, it is time to determine how many plants are needed for the bed. To do this, a gardener needs to determine how many square feet of garden space they have and how large the plants will be at maturity. The mature size of the plant is usually printed either on a tag on the plant or on the seed packet. Generally, a plant's height corresponds to its width. For example, a plant that has a full height of 10 inches will need about a 10-inch spacing. Using the spacing chart in Table 2, will allow the gardener to determine that 1.44 plants would be needed to fill one square foot area.

Whether plants are purchased from a garden center or grown from seed, most come with a tag or information printed on the seed packet. This information will include the plants mature height and width. Annuals may call for spacing anywhere from 6 to 12 inches apart, depending on their growth habit. Biennials and perennials should be spaced in proportion to their mature spread.

Proper spacing is important because if plants are too close, poor air circulation occurs. This can lead to problems with foliar diseases. Plants need air moving over their leaves to dry off excess dew, water and humidity. In contrast, if plants are spaced too far apart, the garden will look sparse and weeds will take advantage of the vacancies.

**Design**

Garden design is the creative planning of outdoor space for the greatest possible amount of harmony, utility and beauty. It requires certain skills, but ultimately, a garden's beauty is in the eye of the beholder. The designed garden is a work of art. However, it has unique qualities that distinguish it from other 2-dimensional arts. The garden can be walked through, around, over and under. The design is not static. As the season changes, as shadows change, as clouds move, the design is constantly modified making it a dynamic and living work of art.

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**Table 2. Plant Spacing Calculations:** Multiply the number of square feet by the number of plants required per square foot using this table to determine optimal number of plants

<table>
<thead>
<tr>
<th>Distance Apart</th>
<th>Plants Per Sq. Ft.</th>
</tr>
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<tbody>
<tr>
<td>4&quot;</td>
<td>9.11</td>
</tr>
<tr>
<td>6&quot;</td>
<td>4</td>
</tr>
<tr>
<td>8&quot;</td>
<td>2.25</td>
</tr>
<tr>
<td>9&quot;</td>
<td>1.77</td>
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<tr>
<td>10&quot;</td>
<td>1.44</td>
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<tr>
<td>12&quot;</td>
<td>1</td>
</tr>
<tr>
<td>18&quot;</td>
<td>.45</td>
</tr>
<tr>
<td>24&quot;</td>
<td>.25</td>
</tr>
<tr>
<td>36&quot;</td>
<td>.11</td>
</tr>
</tbody>
</table>

**One Flat of 100 Plants Will Cover:**

<table>
<thead>
<tr>
<th>Inch Spacing</th>
<th>Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>11</td>
</tr>
<tr>
<td>6&quot;</td>
<td>25</td>
</tr>
<tr>
<td>8&quot;</td>
<td>44</td>
</tr>
<tr>
<td>10&quot;</td>
<td>70</td>
</tr>
<tr>
<td>12&quot;</td>
<td>100</td>
</tr>
<tr>
<td>15&quot;</td>
<td>156</td>
</tr>
<tr>
<td>18&quot;</td>
<td>225</td>
</tr>
<tr>
<td>24&quot;</td>
<td>400</td>
</tr>
</tbody>
</table>
The best way to become a successful garden designer is to practice. When planning a garden near or around the home, suggest coordinating the color scheme of the plants to the exterior of the home. If the home is neutral-beige, gray or white- any color scheme can be chosen. If the home has colorful trim, suggest colors that echo or compliment it. Until a comfort level is reached in selecting colors, it is a good idea to stick to two or three repeated colors in the annual plantings. This provides a planned, unified look for the garden and avoids a hodgepodge appearance that lacks focus. Additionally, grouping plants in drifts can create unity and line in a garden. For more information on design, see Chapter 15, Landscape Design.

**Design Hints, Tips and Examples**

- Ground covers provide broad brush-strokes of background color. They should not be used to outline a bed. They should be thought of as part of the composition, an element for contrast or complement.
- To provide a vertical accent, consider using: Joe-pye weed, purple coneflower, foxglove, dill, Mexican bush sage, various ornamental grasses, garden phlox, alliums, verbascum, hollyhock, larkspur, delphinium, cleome, sunflower, Brazilian verbena or black-eyed Susan
- For rounded or shrubby forms, consider using: Artemisia, autumn sage, culinary sage, rosemary, catnip, coleus, threadleaf coreopsis, santolina, gaillardia, linear-leaf zinnia, lantana, coleus, Mexican mint marigold, catmint, perennial salvias, medallion flower (Melampodium), gomphrena, nierembergia or dwarf marigold such as ‘Ladybird’
- For cascading, arching or weeping forms, consider using: Bushclover, perennial verbena, ornamental sweet potatoes such as Marguerite or Blackie, grasses, ivy-leaf geranium, vinca vines, Solomon’s seal, ferns or toadlily
- For bold, coarse foliage, consider using: Canna, hosta, hollyhock, Joe-pye weed, yucca, foxglove, perennial hibiscus, helenebore, bergenia, wooly mullein, riceplant or cardoon
- For purple or bronze foliage, consider using: Coleus, purple heart, castor bean, ornamental sweet potato Blackie, ajuga, red shield hibiscus, various canna, burgundy forms of loropetalum, purple fountain grass, heuchera or sedums, such as ‘Atropurpurpureum’ or ‘Dragon’s Blood’
- For silvery, bluish or variegated foliage, consider using: Cheddar pink dianthus such as ‘Bath’s Pink’ or ‘Firewitch’, catmint, ‘Silver King’ or ‘Emerald Gaiety’ euonymus, various yuccas, artemisia ‘Powis Castle’, Russian sage, Clary sage, lamb’s ear, wooly mullein, various grasses and sedges, variegated forms of mondo, liriope, ajuga, English ivy, vinca vine, hosta, or deadnettle
- If an alternative groundcover look is desired, consider using: thymes, pennyroyal, dead nettle, yellow archangel, perennial verbenas (most annual types don’t perform well in hot areas), creeping Jenny, lamb’s ear, thrift, creeping forms of sedum, hardy plumbago (leadwort), soapwort, candytuft or dianthus—especially the cheddar pinks, such as ‘Firewitch’ or Bath’s Pink’
- If winter interest herbs and perennials are desired, consider using: oreganos, helenebore, arum, winter savory, rosemary (may get zapped in a rough winter), candytuft, sedum, lambs ear, ajuga, dianthus (hardy species), sage, parsley, lavender, santolina, germander, chives, burnet or artemisia
Planting Times
In Tennessee, the average last frost date is April 15. Therefore, it is usually safe to plant after this date. Keep in mind that this date can vary slightly throughout the different climatic regions of the state so inform gardeners to contact local County Extension offices for a more specific date in their area.

Annuals
Cold hardy annuals, such as pansies, dianthus and snapdragons, perform better in Tennessee during the winter season and should be planted September through October. These annuals should not be planted for summer show because they generally die out due to heat stress. Likewise, warm-season annuals may not be cold tolerant or require long days to bloom.

Biennials and Perennials
When planting biennials or perennials, the ideal time is in the early fall, after the hot days of summer have passed. Planting should be stopped around the middle of October to allow plants to become established before freezing temperatures occur. Another good time to plant biennials or perennials is as soon as the ground thaws in the spring. These plants can also be planted into the summer, but the heat and humidity can be especially hard on new transplants in Tennessee. Therefore, it is critical to monitor the plants’ water requirements daily.

Special Challenges
The heat and humidity of summer, as well as the alternate freezing and thawing of the ground in winter, gives gardeners in the mid-south a special challenge. Annuals, such as pansies, lobelia, phlox, stock and snapdragons, do not flourish and thrive during the summer in our Tennessee gardens due to heat stress. Also, the intermittent freezing and thawing can sometimes trick plants into breaking dormancy early, only to be killed by another freeze of the season. Therefore, before they begin to plant, it is important to teach gardeners which plants can perform well in this area. The University of Tennessee Gardens is an excellent resource for determining which plants are tolerant or Tennessee growing conditions. Advise clients to take advantage of research reports and information disseminated through local County Extension offices about plant performance.

Buying Plants
After selecting, preparing and designing the garden or landscape site, it is time to visit a reputable nursery or garden center to look for plants that are desirable and compatible with the conditions in the garden. The secret to successful gardening is choosing plants that grow in harmony with each other and with the garden or landscape conditions.

Selection Process
First and foremost, teach gardeners to choose healthy plants. To do this, tell them to examine the leaves first. Brown or black spots, rips or tears should not be present on the leaves. Also, the leaves should not be droopy or wilted, as this could be a sign of water stress or root disease. Although plants with water stress may survive, damage has already been done. Therefore, it is better to get plants that have not been stressed.

After choosing plants with healthy foliage, it is time to inspect the roots. This is done by removing plants from their containers, turning them upside down and gently tapping the bottom. The plant will be released from the pot, leaving the root system exposed. A healthy

Purchasing Annuals
Annuals are usually available in cell-packs. These are plastic trays that are divided into sections that contain four, six or eight plants in a pack. Garden centers and nurseries may refer to annuals as bedding plants. This refers to their propensity for being planted into the garden in large groups to produce a mass of color. Perennials and biennials are often grown in quart, 1-gallon or 2-gallon containers.
root system is white or light brown in color. The roots should not be black, slimy, rotten or odoriferous. Additionally, there should not be any insects present on the roots, leaves, stems or flowers. If a plant exhibits any of these signs, this plant should not be purchased.

In addition to plant inspection, teach gardeners to pay attention to cultivar selection when choosing plants. Cultivar refers to any number of characteristics a plant may have—such as color or height—that it retains after it has been reproduced. Often success with certain plants is largely due to the particular cultivar that is chosen. Gardeners should always be on the lookout for plant cultivars that are award winners. Several plant award winner programs exist. These programs include: All-American Selections (AAS), Proven Winners, Perennial Plant of the Year, Georgia Gold Medal Winners and Fleuroselect Winners.

The list of the most current, top performing annuals and perennials for Tennessee can be found on The University of Tennessee Gardens website. This website is listed in the Resources section at the end of this chapter. This list can also serve as a guide in selecting proven, durable plants for this region.

Reputable garden centers and nurseries most often employ knowledgeable, trained personnel that can usually answer most questions, including questions about award winning cultivars. Additionally, garden centers and nurseries generally feature choice cultivars of plants proven to be successful in this region and offer high quality plants. These establishments may be more expensive than mass merchandisers, but the trade-off is expertise, variety and quality.

### Selecting Outstanding Plants for the Garden

To get the best start as possible when planting, the most healthy and vigorous plants available should be selected. It is generally better to purchase younger, succulent plants not in bloom than plants that are fully mature and in full bloom. Older plants look great and can certainly catch the eye, but they will not adapt to the garden as quickly as a younger plant. A lot of energy goes into flower production. This saps energy from the plant that could be used for acclimating to its new environment. Additional tips for an outstanding garden include:

- Selecting plants that have a uniform growth habit and form. Misshapen plants can take a lot of time to balance out and appear normal in their growth. Branching should be evenly spaced.
- Carefully studying the color of the foliage. Foliage color can be an indicator of nutritional problems. Pale green to yellow foliage generally means poor nutrition, especially in nitrogen. A good dose of fertilizer will most likely remedy the problem, but the plant has been growing on limited resources and the quality of the plant is not quite what it could be. Before dismissing a plant on this basis, the gardener should be certain that the plant is not a variety that is meant to have yellow/gold foliage.
- Inspecting the plants carefully for insects. Common insects include aphids, scale, mealybugs, snails and spider mites. To do a thorough inspection, the underside of the foliage and the base and underside of leaf petioles need to be examined. Insects do not like direct sunlight so they hide. Also, the plant should be shaken to see if any insects fly away.
- Inspecting the plant foliage and roots carefully for diseases. Foliar diseases generally are brown to black, but can also be red, spotted or have dieback on leaf margins or flowers. To inspect roots, plants need to be removed from the container. Healthy roots should be white to light tan. Diseased roots will be dark brown to black and will break apart easily. The soil may have a foul odor as well. Symptoms of root disease include stunted growth or wilted foliage.
- Purchasing plants where the root system has filled the container, while insuring the plant is not root-bound. Root-bound plants can be stunted and hardened-off due to a high demand of water and a lack of root space.
- Selecting plants free of any mechanical damage such as scars, bruised bark or stems, and broken branches. Open wounds are an invitation to diseases and insects.
- Making sure that plants are snug and secure in their container. Wobbly, dry plants are an indication of broken roots around the base of the stem.
Planting
Now that the plants and the design have been selected, it is time to plant. Cloudy or overcast days are best for planting; hot, windy days should be avoided. Before starting, the plants and the bed need to be moist, but not soggy. Walking on, or digging in, a soggy bed can compact the soil and ruin its structure by creating large unbreakable clumps. If the soil gets compacted, the roots will not be able to penetrate the ground and the plants will suffer.

Once the soil is moist, the plants should be placed in the spots where they will be planted. Plants should be removed from their containers a few at a time. This will keep the roots from drying out. Additionally, plants should be planted at the same level they were growing in their containers. If planted too deep, there is a chance they will develop crown rot. If planted too shallow, the roots will be exposed and excessive drying will occur, causing some plants to die.

If the roots are tightly wound around the soil in the container, the root ball needs to be broken. This can be done by hand loosening the roots or by scoring the root ball in three or four places with a knife. This stimulates new root growth and encourages the root system to grow into the soil. After all of the plants are planted in the ground, the plants need to be thoroughly watered. Watering helps the plants settle into the soil and removes any air pockets around the root ball.

Mulch
After the plants are in the ground and watered, it is time to mulch. Mulch is important because it controls weeds, retains soil moisture, reduces soil temperature fluctuations, unifies and defines the garden design, and helps prevent the germination and growth of annual weed seedlings. Mulch can also help some perennials survive the winter by insulating plants from the alternate freezing and thawing temperatures. A layer of 3 to 4 inches of mulch should be applied after establishing a new garden, every spring and every fall. The mulch should be evenly spread around the plants, not heaped around or on top of them. Too much mulch around the crown of the plant can cause the plant to rot.

Mulches can be either organic or inorganic; both provide unique benefits. Shredded hardwood, pine bark, shredded leaves and pine needles are all types of organic mulch. These mulches readily decompose, and as they break down, they provide valuable organic matter that improves the water and nutrient holding abilities of the soil. Organic mulch with a small particle size, such as compost, is ideal for flower gardening. Generally, the smaller the mulch particle size, the faster it decomposes, enriching the soil.

Inorganic mulches include pea gravel, broken brick and lava rock. Contrary to organic mulches, the benefit of inorganic mulches is that they are incapable of breaking down. This makes them durable in the landscape. One disadvantage is that they will not improve the soil.

Water
In order for plants to remain healthy and vigorous, they need adequate water throughout the growing season, which is generally between 1 and 2 inches per week. Plants may need more or less then this depending on their location. For example, plants in elevated sunny spots may need more, whereas plants in low-lying, shady spots may need less. To determine if plants are getting adequate moisture, teach gardeners to examine the leaves of the plant. If they are drooping or wilted, the plant likely needs water. Feeling the soil can also give an indication of plant moisture. If the soil is dry and crumbly, the plants likely need water. Once plants are established, they should be watered slowly and deeply, for the purpose of replacing ground water. Frequent and shallow watering is not recommended because it encourages roots to develop near the surface of the soil, making them vulnerable to drought conditions.

The ideal time of the day to water is in the early morning. Watering before the heat of the day prevents water form evaporating and provides the plant with the moisture it will require throughout the day. If possible, watering late in the evening should be avoided because moisture will remain on the plants foliage during the night when fungi and molds are extremely active. To maximize an irrigation plan, teach gardeners to group plants with similar watering requirements in the same areas. For more information on watering, see Chapter 4, Water Management.
Fertilizing
There are a variety of fertilizers available for flower gardens. Water-soluble and slow release fertilizers are the two most commonly used types. Teach gardeners to always follow directions when using any fertilizer and to select a fertilizer that is labeled for use on annuals, biennials and perennials. For more information on fertilizing, see Chapter 3, Soils and Plant Nutrition.

Water-Soluble Fertilizers
Water-soluble fertilizers are readily available to the plant, but leach out quickly. Consequently, water-soluble fertilizers can cause problems ranging from leaf burn to groundwater pollution. Water-soluble fertilizers work relatively well in cooler weather and can lower the pH of the soil. This type of fertilizer requires mixing before each application and needs to be applied every 7 to 10 days.

Slow Release Fertilizers
Slow release fertilizers take longer to become available to the plant. They release nitrogen to the plant over an extended period of time and tend to burn the plants less frequently than water-soluble fertilizers. Plants use most of the nitrogen; therefore, little is left to leach into the surrounding soil and groundwater. Slow release fertilizers may not be as effective in cooler weather because they are released in response to soil temperature and moisture. The advantage of a slow release fertilizer is that it only needs to be applied once or twice during the growing season.

Fertilizer Application
Generally, for slow release fertilizers, 1 to 2 pounds of fertilizer per 1000 square feet is either tilled into the soil, or spread across the surface of the soil, at the beginning of the season. The rate for water-soluble fertilizers may differ and can be found on the packaging. When annuals slow in their growth or when yellow leaves begin to appear, fertilizer may need to be reapplied. Perennials may require an additional application midsummer, but fertilizer should not be reapplied in the fall. This is because fertilizers stimulate plant growth, and in the fall, plants need to go dormant to prepare for winter.

Problems
Even with the best of care, problems can arise in plants. Conditions such as: stress, snails and slugs, insects, diseases and household pests can cause trouble from time to time. Following is a brief description of some stresses and snails and slugs. The other conditions are covered in detail in other chapters.

Common Stresses
Plants generally develop problems when they are under some type of stress. Stress factors include: too much or too little light, too much or too little water, overcrowding, poor nutrition and poor soil. That being said, gardeners can decrease the stress on plants if they are taught to: properly prepare the soil, purchase healthy plants, correctly space the plants, provide adequate water and provide sufficient light.

Snails and Slugs
Other frequent problems of gardeners are snails and slugs. The major symptom of snail or slug damage is foliage that has been partially eaten or full of holes. Clear, shiny trails left behind on the soil or foliage is also an indication that snails and slugs have been feeding. Snails and slugs feed at night, so damage appears with no culprits in sight.

Because snails and slugs enjoy hiding in mulch, pulling the mulch away from the crowns of the affected plants can deter them. Another solution is to spread Diatomaceous Earth around the affected plants. Diatomaceous Earth is made from the crushed bodies of tiny sea creatures and can be purchased at most garden centers. As the slugs attempt to crawl over the product to the plants, it will scratch up their bodies and they eventually die.

Garden Maintenance
Garden maintenance is necessary to keep gardens looking nice and plants healthy and productive throughout the growing season. To this end, most plants benefit from cutting back, pinching, deadheading or dividing. These techniques, as well as techniques for weeding and edging, are detailed below.
Some perennials need to be cut back after blooming. If new growth is apparent at the base of the plant, cutting back to that point will encourage the production of new and healthy foliage. In some instances, cutting back a plant will encourage a second flowering later in the season. Tall perennials, such as asters that bloom in the fall, can be cut back by half twice in the growing season. This encourages them to be bushier and lower growing. Semi-woody perennials can be pruned in spring through late summer, but they should not be pruned in the fall or winter, as this would cause winter damage. Semi-woody perennials include: Russian sage, lavender, and santolina.

**Pinching**

Most plants that produce multiple shoots and flowers benefit from an initial pinching, or removal of the terminal growth point. Removing the growing point back to ½ to 1-inch above a leaf stimulates side shoots to grow. This gives the plant a fuller, bushier appearance with generally more blooms. Plants that should be exempt from this practice include those that only produce one flower stalk with no subsequent blooming such as: digitalis, delphinium and stock.

**Deadheading**

Throughout the growing season, faded or withering blooms should be removed from the plant. This is process is known as “deadheading” and it prevents the development of seed and encourages new flowers to develop. Deadheading also makes the garden look neater and promotes longer flowering periods in annuals and many perennials.

Most annual flowers can be removed with the thumb and index finger. However, with large planting areas, shears or pruners can be used to accomplish the task. Most perennials require pruners for deadheading.

**Dividing**

Most perennials produce larger and denser clumps each year. Dividing is a method of separating these clumps into two or more pieces. If the plant is flowering less, seems less vigorous or has gotten too large for the area it was intended for, then it needs to be divided. The ideal time to divide perennials in Tennessee is between September and November.

Dividing techniques vary depending on the individual plant growth habit. However, teach gardeners that whenever they are dividing, they need to make sure to get one or two stems, or eyes, per division. This will insure that the plant will be big enough to bloom the following season. Some plants have shallow, fibrous root systems that can be easily pulled apart once the plant has been dug up. Examples include: Shasta daisies and chrysanthemums. Other plants have strong, woody roots that grow in a tangled mass. To divide these, the individual crowns must be located after the roots have been dug up and then a blade of a sharp spade or knife needs to be forced between the crowns. Fleshy rooted plants such as daylilies and hostas can be divided by driving a spade or a garden fork into the middle of the clump. It is important to remember that after the divisions are created, the plant should be treated as if they were just brought home from the nursery.

**Weeding**

Though it can be a tedious chore, weeding is necessary in all gardens. Not only are weeds unsightly, but they also compete with desirable plants for light, water and nutrients. A well-mulched garden will prevent many weeds from germinating and will make it easier for those that do invade to be removed. Weeding on a regular basis will help keep weeds under control. Weeds should be pulled by hand or removed with the aid of a garden tool such as a spade or garden fork. So the weed does not reappear, the entire root system should be
removed. In addition, pre-emergent herbicides can be used to prevent seed germination of most of the common weeds found in flowerbeds. Label instructions should always be followed for the correct application rates and the plants listed on the label. Weeds in the flower garden should not be hoed back into the ground, as this could harm the other plants.

**Edging**

Edging defines the shape of the garden. It can be ornamental or inconspicuous. However, when used to separate a garden from the lawn, it should always extend at least 4 inches deep. This will stop the grass roots from advancing into the garden.

An edging tool will create a sharp border between the lawn and the garden. It may need to be re-cut once or twice during the growing season to keep it defined. Bricks, flagstones or a gravel path will also distinguish the green of the lawn from the out-of-bloom plant foliage. Masonry and stones used for edging add a nice contrast to the flowers and foliage of the garden and provide a decorative framework for foreground plants. Another edging option is low-growing plants that provide interesting foliage texture and color. The silvery foliage of lambs-ear (Stachys byzantina) and the purplish foliage of coralbells (Heuchera micrantha 'Palace Purple') are examples of plants that make excellent edgers.

**Container Gardening**

Container gardening is becoming a popular gardening method. Container gardening can be beneficial when space is limited or when gardening space needs to be altered to enable a garden. Container gardens offer a gardener more control over the environment. The gardener can control placement to the sun, soil conditions, watering and drainage. This allows gardeners to extend a gardening season.

Patio, decks, entrances, courtyards and other small areas can be landscaped with the use of container gardening. Proper selection of plant material and the container is important to ensure a functional and healthy container garden. Containers can be made of any vessel that can hold soil and water, but there does need to be drainage for excess water.

Irrigation is a critical component of container gardening. Plants should be watered when the media does not have enough water to supply the plant. An easy technique to determine this occurrence is to use the ‘first knuckle method’. This method is done by sticking a finger into the container media to the first knuckle. If it comes out wet, then do not water; if dry, then water thoroughly or until water leaches out of the drainage holes in the bottom of the container. Watering thoroughly each time you water can prevent salt buildup from fertilizer release. If the water quickly leaches out of the container, the media and the root system may be very dry. Sometimes the media can shrink away from the sides of the container, and the irrigation water just runs down the sides and out of the container without wetting the media. If this happens, soak the plant and container in a bucket of water until the media is re-saturated.

Fertilizer application may need to be frequent in container gardening. Routine watering may leach some of the fertilizer out of the container, so light and frequent fertilization can be the best approach. There are several commercial fertilizers available that can be applied with the irrigation water. Another approach is to use a controlled-release fertilizer granule. Depending on the release pattern (three to four months, six to eight months, etc.), these fertilizers can provide season-long nutrition to the plant.

Container gardening has become a popular landscaping technique. Plants can be potted.
and protected in the early spring and late fall to extend the time that plants are contributing to the landscape. The flexibility and unlimited ideas of container size, dimension and choice of plant material can provide much enjoyment in the garden.

**Design**

Designing a container garden can be as simple or complex as the gardener desires. When designing a container garden it is important to keep in mind the color, shape and height of the container. These characteristics can be used to choose plant material. Plant material should complement the container space and shape. Spillers, plants that cascade or spread over the sides of containers, can be used to accent the shape, color and texture of a container. Filler plants are used to fill space between plants and enhance the form and shape of the overall design. Thrillers are plants that add height, color, texture and act as a focal point for the design. For more information on design, see Chapter 18, Landscape Design.

**Replace**

Annuals, perennials and woody plants can be mixed in a container. When one plant becomes less interesting, it should be replaced with another. Recycling the surviving plants and adding back fresh media when replanting new additions will keep the container healthy and attractive.

**Containers**

Containers should be strong enough to hold the growing media and the mature plants. They should be wide enough to not tip over.

Container styles and materials are unlimited: plastic, clay pots, tubs, wooden boxes, barrels, concrete and metal may all be used. The main requirement is that the container be well-drained and suitable for the plant to grow in. Containers should have drain holes to allow excess water to drain out. Generally, taller containers provide longer water columns and, therefore, better drainage. Most commercially produced containers have adequate drainage holes; if not, or if a custom made container is used, then drill two good size (1/2 to ¾ inch) drainage holes for every square foot of bottom area. There are a few planters sold that do not have drainage holes, and many times can be the cause of plant mortality.

**Media**

Soil-less mixes are best suited for containers because of their light-weight and clean components. Soil-less mixes usually include a combination of peat moss, perlite, vermiculite or sand. Fertilizers and wetting agents are usually added to help these materials retain moisture and adequate nutrition. Once the wetting agent dries out, the mix is difficult to rewet. However, once the plants are established, fertilizers can be added.

Another important aspect of container gardening is the soil or growing media. A fast draining, porous media is important to provide air space; but a media needs to have water-holding capabilities that will provide water to the plant. Clay, heavy soil or poorly drained soil can be a primary cause for plant failures in container gardening. A good container media would contain peat moss, organic materials, sand (for weight) and sandy loam soil. Peat moss provides good water-holding capabilities in the media. If too much peat moss is used then the media may not drain as well and the air space could be restricted. Other good substitutes for peat moss are rice hulls, cotton gin waste and knafe. Most garden centers stock a selection of prepared potting media.

When potting, be sure that the media level is about one inch below the edge of the container to make watering easier and more efficient. Also, do not place the plant too deep in the media. The top of the root system should be level with the media surface. If planted too deep the root may suffer from lack of air space. When selecting plants for container gardening, be sure to size the plant with the container. There needs to be room in the container for the root system of the plant to grow. As the plant grows larger, a larger container may be needed.

**Placement**

Containers should placed in accordance with plant needs. If a plant needs full sun, the container should be placed in a sunny area. If a plant needs partial shade, the container should be placed in an area that provides partial shade. Most vegetables, sun annuals and perennials require full sun, which is more then 6
hours of sunlight. Shade plants usually require less then 6 hours of light.

As plants in the container mature and grow, their water and nutritional requirements will increase. Therefore, containers should be placed where water is easily accessible.

Wildflower Gardening

Location

As with other types of gardens, teach gardeners to take their time and analyze their wildflower garden site. Slopes and site features that may influence the garden should be examined. This includes looking at natural features such as a beautiful boulder, a habitual wet area or an old stump that could be incorporated into the garden. Sun and shade patterns should also be observed throughout the day and throughout the seasons. Existing plants should also be looked at: Do they complement or impede the design intention? Gardeners should also know about existing utilities, both above and below-ground. Local utility companies can come and mark the location of underground utilities. Finally, historical information, such as the past land usage of the property, should be gathered.

The next step in assessing the site is to locate and mark all existing features, such as trees, shrubs and walkways, on a rough plan. Graph paper is an excellent medium to use in creating this “as-built” drawing. A popular scale to use is the one-eighth scale; that is, 1 inch equals 8 feet, or 1/8 of an inch equals a foot. While the eight markings on a ruler can be used to do this, an architect’s scale makes the job much easier and is well worth the small cost. Graph paper with 1/8-inch squares can also make this task simple, as each square equals 1 foot. With all the existing features noted on a rough drawing of the site, the garden can be created on tracing paper first. This is helpful because ideas can be reworked and plans fine-tuned, if necessary. Encourage gardeners to experiment with different ideas and designs and to not be discouraged if it takes a few tries to get the design right. The planting and care of wildflowers, in most cases, is no different from that of other garden plants. After the garden is designed and the plants are selected, the preparation and planting techniques are similar to a perennial garden. The best planting time for most wildflower gardens is in early to mid-spring and fall.
Site

Most wildflowers prefer a well-drained, slightly acidic soil, 5.5–6.0 pH. Adding materials such as organic matter and chemical nutrients to change the pH and to correct mineral deficiencies will condition and improve the soil. The addition of shredded leaves is effective in conditioning and improving woodland soil. Providing wildflowers with the same type of soil found in their native communities will help ensure their survivability. Wildflower gardens can be in full sun, shade or partial sun. However, as indicated above, the right plant needs to be selected for the right location. The native tickseed (coreopsis) is a good selection for a sunny location.

Maintenance

From planting through the first growing season, wildflowers should receive approximately 1-inch of water each week during their establishment period. The goal is to saturate the soil to the depth of the plant’s root ball. This encourages root growth deeper into the soil, enabling plants to better withstand periods of drought, as well as tree root competition. If the garden is in a woodland setting, tree roots can be competitive for moisture and may need to have supplemental watering during establishment or during drought periods. During the second growing season, the plants should be well established and may need occasional watering during dry periods and drought.

Mulch should be used in wildflower gardens because it helps keep the soil cooler, slows down the rate of water evaporation, aids in winter protection, prevents the germination of many weed seeds and helps define the wildflower garden design. Materials such as shredded bark, wood chips, pine straw, shredded leaves, compost and stone, applied in a 2- to 3-inch layer, have proven to be satisfactory mulch materials. In a woodland setting the best mulch, according to veteran wildflower gardeners, is a layer of shredded leaves. The leaf mulch closely resembles the natural leaf litter found on the forest floor and acts as a good source of organic matter in addition to the benefits mentioned above.

Fertilizing is another important component to a healthy wildflower garden. The fertilizer promotes and encourages growth and provides the nutrients the garden needs to flower. Wildflower gardens benefit from the use of a balanced all-purpose water-soluble fertilizer or a slow-release fertilizer.

The first several years after planting a wildflower garden, the principal tasks of upkeep will be to remove weeds and add mulch and water occasionally. During this time, the design of the garden can be improved or added to, if necessary. If wildflowers will be transplanted into the garden, they should be moved when the plants are dormant. Spring blooming wildflowers typically die and become dormant by mid to late summer, and can be transplanted once the leaves have yellowed. Plants that bloom in the summer or fall can safely be transplanted in the early spring. Regardless of the time of year when transplanted, remind gardeners to never allow the roots to dry out while transplanting.
Common Herbaceous Plants for the Home Garden

Annuals

Ageratum (*aj-er-A-tum*), *Ageratum houstonianum*

*Ageratum* is also known as flossflower. Flossflower has numerous terminal clusters of cymose-arranged flowers that resemble daisies without the petals, ray flowers. The flowers are typically blue, but there are white and pink varieties. The flowers are long-lived, and the habit of most varieties is rather compact - less than 12-inches tall - making them good choices for edging. Flossflower is easy to start from seeds or from cuttings. Young plants should be transplanted to the garden after the threat of frost has passed. Flossflower performs well throughout the summer in sun or partial shade.

**Sweet Allysum (Al-E-sum), Lobularia maritime**

Sweet Allysum is a low growing plant, less than 6 inches, with a spreading habit, about 12 inches. It is covered with hundreds of tiny white, pink or purple flowers. The individual flowers have four petals, typical of members of the Mustard/Cruciferae family, and a sweet fragrance, hence the name. The seeds are often sown in mass since the individual plants are quite small. Also, seeds can be directly sown in the garden during the spring or late summer. Sweet Allysum performs best during cooler weather, so it may cease to flower during the heat of summer, but will resume in September or October. The plant requires good drainage, but it is not drought-tolerant.

*Begonia* (*ba-gOn-ya*), *Begonia semperflorens-cultorum*

*Begonia* plants are popular choices for flower-beds. *Begonia* flowers can be single or double and they can be seen continuously through the summer and early fall. Its clusters of white, pink or red flowers are formed in the leaf axils. The foliage comes in green or bronze. Although they prefer shade, *Begonia* plants will tolerate sunlight, provided sufficient water is available. *Begonia* plants usually start from very small seeds. The seeds are usually coated to make them easier to handle. *Begonia* plants are relatively easy to start from shoot-tip cuttings. Tidy *Begonia* plants, 6- to 18-inches tall and wide, make them ideal for residential or commercial landscapes. Flowering plants can be dug in the fall and used as an indoor plant in the winter. These plants can be fibrous-rooted or waxed.

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**Table 3. A Sample of Wildflowers for Sunny and Shaded Areas**

<table>
<thead>
<tr>
<th>Wildflowers for Sunny Spots-Prairies or Meadows</th>
<th>Wildflowers for Shady Spots-Woodlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beebalm (<em>Monarda didyma</em>)</td>
<td>Bleeding Heart (<em>Dicentra spectabilis</em>)</td>
</tr>
<tr>
<td>Black-Eyed Susan (<em>Rudbeckia hirta</em>)</td>
<td>Celandine Poppy (<em>Stylophorum diphyllum</em>)</td>
</tr>
<tr>
<td>Blanket Flower (<em>Gaillardia x grandiflora</em>)</td>
<td>Columbine (<em>Aquilegia spp.</em>)</td>
</tr>
<tr>
<td>Butterfly Weed (<em>Asclepias tuberosa</em>)</td>
<td>Foam Flower (<em>Tiarella cordifolia</em>)</td>
</tr>
<tr>
<td>Cardinal Flower (<em>Lobelia cardinalis</em>)</td>
<td>Green ‘n’ Gold (<em>Chrysogonum virginianum</em>)</td>
</tr>
<tr>
<td>Goldenrod (<em>Solidago spp.</em>)</td>
<td>Mayapple (<em>Podophyllum peltatum</em>)</td>
</tr>
<tr>
<td>Joe-Pye Weed (<em>Eupatorium maculatum</em>)</td>
<td>Shooting Star (<em>Dodecatheon meadia</em>)</td>
</tr>
<tr>
<td>Oxeye Daisy (<em>Chrysanthemum leucanthemum</em>)</td>
<td>Solomon’s Seal (<em>Polygonatum odoratum</em>)</td>
</tr>
<tr>
<td>Purple Coneflower (<em>Echinaeeae purpurea</em>)</td>
<td>Virginia Bluebells (<em>Mertensia virginica</em>)</td>
</tr>
<tr>
<td>Sneezeweed (<em>Helenium autumnale</em>)</td>
<td>White Trillium (<em>Trillium grandiflorum</em>)</td>
</tr>
</tbody>
</table>
Browallia (brO-wal-E-a), Browallia speciosa

Browallia is a blue flowering, bedding plant that likes the shade. The flowers resemble African violets. The 1-inch diameter flowers are solitary and form in the leaf axils. Mature plants will reach 8 to 16 inches in height and width. Browallia is easy to start from seed or shoot-tip cuttings. Young plants should be transplanted to the garden after the last frost date. This member of the potato family can be dug and used as a flowering indoor plant throughout the winter.

Celosia (sel-lO-sE-a), Celosia cristata

Celosia is also known as cockscomb. Cockscomb is available in plume/flame, crested or wheat types of flower heads that typically come in hot colors such as: red, yellow, gold and orange. Cockscomb plants perform well in full sun and will tolerate some drought. They are not tolerant of cool weather; therefore, they need to be planted after the soil has warmed-up. Cockscomb is propagated from seed and the flowers are relatively easy to dry.

Cleome (kI-E-O-mE), Cleome hasslerana

Cleome is also known as spider flower. Spider flower is a tall annual, 3 to 4 feet, which is perfectly suited for a large display bed. Each stem has numerous white or pink flowers that continue to open throughout the summer.

Dianthus (dl-an-thus) Dianthus chinensis

Dianthus flowers are typically white, pink or red and the plants grow to be 6- to 12-inches tall with a mounded growth habit. Dianthus thrives in cool weather; therefore, they are usually planted in the fall for spring flowering. The plants require some shade in the summer to reduce heat stress. If the Dianthus survives the summer temperatures, it is considered a
short-lived perennial. *Dianthus* plants are usually propagated by seed and are also known as annual pinks and China pinks.

**Dusty Miller Senecio cineraria**

Dusty Miller is grown for the accent that its foliage creates in the landscape. The leaves are thickly covered with silvery hairs. Plants generally grow up to 12-inches tall and are often used as a border edging or in containers. Flowers are usually removed if present. Dusty Miller grows best in full sun and will tolerate some drought. They can be planted a few weeks before the last frost and occasionally overwinter.

**Flowering Cabbage & Flowering Kale Brassica oleracea**

Planted in late summer/early fall, flowering kale and flowering cabbage usually survive into early winter. White, pink or purple variegated leaves provide interest both in the garden and as an edible garnish. Low nitrogen levels will produce more variegation. Plants usually reach 12-inches tall before a heavy frost kills them. Cabbage and Kale are both propagated by seed.

**Geranium Pelargonium x hortorum, P. peltatum & P. graveolens**

Garden geraniums are correctly referred to as Pelargonium, while the true geranium is known as the perennial crane’s bill. Garden geraniums are among the most traditional bedding plants and plants for containers. *P. hortorum* is propagated by two methods. Those propagated by seed are referred to as “seed” geraniums, while those propagated vegetatively are called “cutting” or “zonal” geraniums. Seed geraniums produce smaller, but more numerous, flower heads (umbels). They are less expensive and are usually planted in the flowerbed. Cutting geraniums produce huge clusters of flowers on larger plants. They are more expensive and are commonly used in container plantings. Geraniums come in a wide assortment of red, pink and white colors. Geraniums do not always perform well in the summer heat and humidity. The flower stalks are quite susceptible to gray mold (*Botrytis*).

A second species of geranium is *P. peltatum*, or the ivy geranium. Ivy geraniums have a trailing habit; therefore, they are usually used in containers or window boxes. The leaves are much smoother than *P. hortorum*. They are propagated solely by cuttings and are available with single or double flowers.

A third species of geranium is *P. graveolens*, or the scented geranium. These are grown for their sweet-scented foliage. They are usually grown in containers that can be brought indoors during the winter. Scented geraniums are propagated by cuttings and can come in a large assortment of scents including: lemon, nutmeg, peppermint and rose.

**Impatiens (im-pA-shenz), Impatiens wallerana**

*Impatiens* is the most popular bedding plant used for shade. With the exceptions of true blue and yellow, the choice of flower color seems endless. They are very easy to grow from seed and double flowers can be propagated from cuttings. *Impatiens* tolerates considerable sunlight, assuming that adequate water is provided. However, gardeners should be careful not to over water or over fertilize *impatiens*. They are over-sensitive plants and excess water and fertilizer can cause increased growth, which weakens the plant. *Impatiens* are not particularly cold tolerant, but they can be grown in a sunroom during the winter.

**New Guinea Impatiens**

*Impatiens* sp.

New Guinea Impatiens has larger flowers with deeper/richer flower colors then *Impatiens wallerana*. Also, the foliage of New Guinea Impatiens can be variegated. These plants are often used in hanging baskets or in beds. It is always amazing to see how badly these can wilt and still recover after watering. New Guinea Impatiens is almost entirely propagated from cuttings, although seeds are available. Newer varieties are considerably more heat tolerant than in the past. These will tolerate full sun conditions, but they always have the best appearance in the shade.
Marigold (*Tagetes erecta* & *T. patula*)

There are two common species of marigold: African and French marigold. The African marigold (*T. erecta*) has 2- to 5-inch double flowers that are usually yellow or orange. Plant height ranges from 12-inch dwarf varieties to 3-foot tall varieties. The French marigold (*T. patula*) has a more petite appearance. The flowers are 1 to 2 inches and can be single or double. Flower color is yellow and orange with some red and brown tones. Plant height ranges from 6- to 18-inches tall. Marigolds are as easy to grow from seeds as tomatoes. They prefer full sun and adequate moisture, though they will tolerate some drought. Deadheading can be beneficial, especially with the African marigolds.

Nasturtium (*nah-STUR-shum*), *Tropaeolum majus*

Nasturtiums are probably best known for their edible foliage and flowers. The flavor is peppery or mustardy, resembling watercress. Plants are easily started by directing sowing seed into a window box or in the garden after the last frost. The 1 to 2-inch diameter flowers are usually red, yellow or orange. Plant habit ranges from bushy and 1-foot tall, to trailing/climbing and 6-feet long. Nasturtium may cease to flower due to excess nitrogen fertilizer or heat stress.

Nicotiana (*ni_kO-shE-A-na*), *Nicotiana alata*

*Nicotiana* is also known as flowering tobacco. Old-fashioned varieties of flowering tobacco can reach 5-feet tall and produce many 1-inch diameter flowers that are fragrant, especially at night. Newer varieties are 1- to 2-feet tall and less fragrant, but they have more prolific flowering. Flowering tobacco is relatively heat tolerant and will flower all summer and late into the fall. They prefer full sun conditions. White is the most common flower color, but red, pink, lime green, lavender and maroon varieties are readily available.

Pansy *Viola x wittrockiana* and *V. tricolor or cornuta*

Pansies (*Viola x wittrockiana*) have become very popular in recent years. Many new varieties provide an endless palette of colors. Large, 1- to 3-inch flowers are produced profusely during cool weather. Pansies planted in the fall will flower during warm spells throughout the winter and then put on a big show in the spring. Pansies are usually removed from the garden in late spring/early summer when the summer bedding plants are transplanted. If left in the garden, pansies will get leggy and may die in the summer heat.

Johnny-jump-ups (*Viola tricolor*) tend to be more heat tolerant than pansies. The small, ½-inch, flowers are typically white, yellow or purple. They are considered an annual or a short-lived perennial; however, they will reseed themselves and can become naturalized. Both Viola species are usually started from seed.

Petunia (*pe-too-nE-a*), *Petunia x hybrida*

*Petunia* plants can be divided into several different categories. The grandiflora varieties have blooms that are 3 to 5 inches with ruffled or fringed petals. The multiflora varieties have more numerous blooms that are 2 to 3 inches. Double-flowering varieties are available in both groups, although the doubles tend to be weak-stemmed. As a result, they are most frequently used in containers, where they are allowed to cascade. *Petunia* plants are best grown in full sun to partial shade. The list of
varieties is endless and the flowers tend to be whites, pinks, purples or reds. Deadheading is necessary on most varieties to maintain a vibrant flowering plant. *Petunia* plants are usually started from seed. Recently, new vegetatively propagated varieties have been introduced into the gardening trade. These are extremely vigorous and often require additional fertilizer. The vegetatively propagated *Petunia* plants are sometimes referred to as supertunias.

**Portulaca (por-chU-lak-a), Portulaca grandiflora**

*Portulaca* is also known as moss rose. Moss rose is a prostrate-growing plant with narrow, succulent leaves. Individual plants will spread from 6 to 12 inches. The flowers are about 1 inch in diameter and are brightly colored red, yellow, orange and white. They will close in the afternoon. Moss rose plants are very tolerant of hot, dry locations at which other plants falter. They are well suited for the rock garden. Often, many seeds are sown per pot since individual plants are rather small.

**Salvia (sal-vE-a), Salvia splendens and Salvia farinacea**

*Salvia splendens* is a common annual used as a bedding plant. It is most often available as a hot red color, but there are also purple and white varieties. Actually, the colored portions of the flowers are bracts, modified leaves, not petals. The flower/bracts are displayed on a terminal raceme that usually reaches 12- to 24-inches tall. *Salvia splendens* should be planted in full sun to partial shade. Dead inflorescences should be removed to promote new growth. These plants should be transplanted to the garden after threat of frost has passed. *Salvia splendens* is also known as “Scarlet Sage” and “Red Salvia.”

*Salvia farinacea* is sometimes considered a perennial in Tennessee, although it is often treated as an annual. It flowers throughout the summer with silvery white or blue flowers which are presented on terminal spikes that are 4- to 6-inches long. Total plant height is 2 to 3 feet. While underused, *Salvia farinacea* is certainly a top performing plant in the Southeast. It is also known as mealy cup sage.

**Snapdragon *Antirrhinum majus***

Snapdragons are traditional garden plants that produce numerous individual flowers on a terminal raceme. Many shades of pink, white, red, orange and bronze flowers are available. Snapdragons are available as 6- to 12-inch dwarf plants or 3- to 4-feet tall plants. Shorter plants are preferred for the flowerbed, and taller ones are used for the cut flower garden. Tall varieties may require staking. Snapdragons are relatively cold tolerant and can be planted in the early spring. They may even survive a mild winter. Snapdragons are typically started from seed.

**Vinca *Catharanthus roseus***

*Vinca* has recently emerged as a top-selling bedding plant. The main reason for its success is that it cannot be beaten for heat tolerance. *Vinca* is a fantastic bedding plant throughout the summer. The glossy dark green foliage is covered with white, pink or purple 1-inch flowers. The plants reach 12- to 18-inches tall and wide. *Vinca* absolutely does not tolerate wet soils or cool temperatures; therefore, it should be transplanted into a well-drained soil after the soil has sufficiently warmed up. *Vinca* is typically propagated from seed. *Vinca* plants are also known as “Madagascar Periwinkles.”

The common name, vinca, can cause some confusion because *Vinca minor*, known as creeping myrtle or periwinkle, is a groundcover and *Vinca major*, known as vinca vine, is a variegated trailing vine used as an accent plant in containers and window baskets. *Catharanthus roseus* is being used as a possible treatment for cancer.

**Zinnia *Zinnia elegans and Z. angustifolia***

*Z. elegans* has 4- to 6-inch flowers in many different colors. Dwarf varieties and tall-cut flower varieties provide a range of plants for many garden uses. *Zinnia* plants do best in hot, dry weather. High humidity conditions cause zinnias to readily succumb to fungal diseases.

Thin-leafed *Zinnia* (*Z. angustifolia* or *Z. linearis*) is a short, 12-inch, annual with a spreading habit. It is very tolerant and a good choice for the flowerbed. The available colors, white, gold and orange, resemble marigolds at a distance. The thin-leafed *Zinnia* does not
have the disease problems of the common Zinnia.

**Biennials**

**Canterbury Bells *Campanula medium***

Canterbury bells come in whites, pinks and blues. They grow 2- to 3-feet tall and may require staking. They prefer moist, well-drained soils in partial shade. Canterbury bells readily self-sow and the seeds should be sown during the summer to produce flowering plants the following year. Canterbury bells are also known as cups and saucers.

**Foxglove *Digitalis grandiflora & D. purpurea***

The first year, foxgloves form a dense rosette of leaves. The following late spring/early summer, foxgloves will produce a large terminal raceme that reaches 2- to 4-feet high. Each raceme produces numerous tubular, 2-inch flowers that usually come in white, pink or yellow. Seeds are sown in the late summer/early fall for flowering the following year. Foxgloves perform best if planted in partial shade, however they may need staking. Foxglove readily self sows.

**Money Plant *Lunaria annua***

Money plants prefer cool weather, thus they perform best in partial shade. The plant produces fragrant pink or purple flowers on a terminal raceme that reaches 2- to 3-feet tall during the spring. In mid-summer, the dead flower stalks are often removed for use in dried flower arrangements. The outer sheaths on the fruit are removed to expose a silver, papery septum for which the plant is named. Often, planting is reserved to the cut flower garden. Money plant readily self sows.

**Sweet William *Dianthus barbatus***

Sweet William plants prefer slightly alkaline soils in sunny to partially shaded areas. The flowers are sweetly fragrant and appear in dense terminal clusters. This makes them a particularly showy species of Dianthus. Seeds usually produce a variety of colors, so division is often necessary to ensure true colors. Sweet William readily self sows.

**Perennials**

**Achillea (a-kill-E-a) *Achillea millefolium***

The name, *Achillea*, is derived from Achilles, who reportedly used this plant to soothe his wounded tendon. The common name for *Achillea* is yarrow. Yarrows provide long-lasting summer flowers. They are usually white or yellow, but reds are occasionally available. ‘Summer Pastel’ yarrows include several shades of pastel pink and yellow. The dense, low-growing foliage is delicately textured and often gray-green in appearance. Yarrow performs well in full sun and is tolerant of relatively poor soil. Good drainage is required for yarrows to thrive. Rainy summers can cause foliar diseases. The flowering heads will reach 1½ -to 3-feet tall. Spring division typically propagates yarrow; however, seed only propagates ‘Summer Pastel’. Yarrow flowers are easily dried and very common in commercial arrangements. Stems should be cut after pollen is visible for best vase-life.
Aegopodium (E-go-pO-dE-um), A. podagraria

*Aegopodium podagraria* ‘Variegatum’ is an invasive groundcover for partial sun. It spreads by underground stems, rhizomes, and must be placed where it will not overtake more desirable plants. It is most valuable when used as a groundcover. It can grow 8- to 10-inches tall. Foliage can be mowed back when it gets unsightly. *Aegopodium* is easily propagated by division. The variegated pattern on the foliage will vary in seed-grown plants. The early summer flowers are not particularly showy, but not particularly unattractive either. *Aegopodium* is also known as bishop’s weed or goutweed.

Alcea (al-sE-a)

*Alcea* is also known as hollyhock. It is an old-fashioned perennial that has maintained its popularity with today’s gardener. It produces a wide variety of colors, including black. The flowers are borne on spikes reaching 2- to 8-feet tall and may require staking. Hollyhocks do best in full sun and are easily grown from seed. They will often re-seed themselves in the garden. Although usually short-lived, the stately appearance of hollyhocks makes them wonderful plants for the perennial border. Insects can ravage these plants, so pesticide applications may be necessary. Additionally, these plants are susceptible to rusts.

Alchemilla (al-ke-mil-a)

*Alchemilla mollis* is also known as lady’s mantle. It is grown for its lovely foliage that is especially noteworthy after a heavy dew or rainfall, since the foliage sparkles with perfect droplets of water. Lady’s mantle is often planted near a garden path where it is allowed to spill out over the walkway. In Tennessee, it requires some shade and ample water. Lady’s mantle is usually propagated by seed, although division is possible. It may also re-seed itself in the garden. Zone 7 is the southern-most limit for this species.

Aquilegia (ak-wil-IE-ja)

*Aquilegia* is also known as columbine. It is an old-fashioned spring flower that is at home in a moist, partially shaded corner of the garden. Many hybrids are available to the home gardener, however ‘Biedermeier’ and ‘McKana’s Giant’ are the most common. Columbine does best when planted in mass because numerous color combinations are possible. It is usually started from seed. Fall planting is required to have flowers during the first spring. Leaf miners love columbine, but rarely cause plant death. Caterpillars may also defoliate these plants in the spring. Hybrid *Aquilegia* may need to be planted every few years, since they may be short-lived.

Artemisia (art-a-mE-zE-a)

*Artemisia* is also known as wormwood. Wormwood is known for its silvery foliage. It can be used as a contrast as a full sun, perennial border. Like most silver-leafed plants, Wormwood requires well-drained soils. Moist, high-fertility soils will cause leggy, disease-prone growth. The foliage on leggy plants may require heavy shearing to rejuvenate a full, bushy habit.

Popular varieties of *Artemisia* include: ‘Silver Mound’, ‘Powis Castle’, and ‘Silver King’. Powis castle has performed admirably for many years in The University of Tennessee Trial Gardens. However, silver mound is rarely long-lived in the Tennessee because it often dies during hot, humid summers and silver king can be invasive.

Astilbe (a-stil-bE), Astilbe x arendsii

*Astilbe* is best grown in moist, partially shady environments. They do not tolerate drought. *Astilbes* are attractive as specimens or in mass. There are many varieties available. The flowering spikes range from dark green to a coppery color. The most successful *Astilbes* are propagated vegetatively from divisions, while *Astilbes* grown from seed are considered inferior. Teach
gardeners that only vegetatively propagated astilbes have cultivar names.

**Begonia (ba-gOn-ya), Begonia grandis**

Begonia plants are tuberous plants that can grow 18 to 24 inches. They are like the shade and are frost hardy to Zone 6a. Begonia flowers are pink and bloom in heart-shaped forms. The foliage is blue-green with deep red-veins. Begonia plants spread by: seed, dividing the tuber or transplanting the bulblet. Begonia plants are also known as “Hardy Begonias.”

**Campanula (kam-pan-U-la)**

Campanula plants are also known as bellflowers. There are numerous species of Campanula available to the Master Gardener. Most have blue flowers that are campanulate, or bell shaped. Campanulas prefer cool growing conditions; therefore, they should be placed where they are protected from direct sunlight. Most campanulas can be easily propagated from seeds. Among the most popular Campanulas is C. carpatica (Carpathian harebells). These plants are at home in rock gardens. C. poscharskyana (Serbian bellflower) are fantastic plants for climbing or cascading over walls. The flowers are less than an inch in diameter, however they are produced in profusion. C. glomerata (clustered bellflower) has an informal appearance in the garden and is often useful as a cut flower. The flowers are produced in a dense terminal cluster that has a spherical appearance. There are more useful campanulas than can be described here.

**Cimicifuga (sim-E-sa-fU-ga)**

C. racemosa is an underused native plant that is ideal for a wooded, shady garden. The candelabra-like flowering spikes reach 6- to 8-feet high. The white flowers appear on top of long wiry stems, thus are showier if planted in front of evergreens or shrubs. This plant prefers moist, shady locations. Seed germination can be difficult. A couple of purple-foliaged plants (var. atropurpurea and ‘Brunette’) are occasionally available. Cimicifuga is also known as bugbane, black snakeroot, cohosh and Appalachian candlestick.

**Convallaria (con-va-lair-rE-a)**

Convallaria is also known as lily of the valley. Although not a hugely showy species, lily of the valley performs well as a groundcover for moist, shady conditions. The flowers have a sweet, permeating smell when harvested and brought indoors. These plants propagate by dividing.

**Coreopsis (kor-E-op-sis)**

Coreopsis plants are also known as tickseed. C. grandiflorum and C. verticillata are carefree perennials that produce masses of daisy-like flowers. The long stems below the flowers make these nice choices for cut flowers. C. grandiflorum ‘Early Sunrise’ is double-flowered and easily started from seed. C. verticillata ‘Moonbean’ has pale yellow flowers that appear for a long time atop delicate, ferny foliage. C. rosea resembles ‘Moonbean’ but has pink flowers and is more invasive. All Coreopsis are best planted in full sun and propagate by division. Deadheading will result in more prolific flowering. Coreopsis is relatively short-lived, typically lasting 2 to 3 years.

**Dianthus (dl-an-thus)**

Division most easily propagates dianthus plants, although seeds germinate rather easily as well. D. gratianopolitanus (cheddar pinks) develop a dense gray mat of foliage and a big flush of small, rose-red flowers in the spring. ‘Tiny Ruby,’ or ‘Firewitch,’ is a lovely double pink that is ideal for the rock garden. D. deltoids (Maiden Pinks) makes a decent groundcover in full sun or partial shade, especially in the later afternoon. Good drainage is necessary for all species of Dianthus. The foliage will often remain evergreen during the winter. Dianthus are also known as “Pinks” and “Carnation.”
**Echinacea (ek-in-A-sE-a)**

*Echinacea* is also known as coneflower, its popularity has exploded in recent years due to its reported value as a medicinal herb. It is also a valuable plant for the full sun landscape, where it will reach 3- to 4-feet tall. The daisy-like flowers have purple downward-curved petals, while the center head is orange. Coneflowers are very easy to grow from seed, although division is possible. These are not specimen plants; therefore, they are best used in the mixed perennial border. Pink, yellow, orange, green and white-petal varieties are also available. The Tennessee coneflower (*E. tennesseensis*) is an endangered species. The purple petals are curved upward, making it readily distinguishable from the common species. It is also less vigorous.

**Ferns**

Ferns can be wonderful additions to a full shade garden. They do best in moist soils, as they are not usually drought tolerant. Ferns are easy, although slow, to grow. Propagation is usually by division. Many species are available. The following is a brief listing:

- Autumn fern (*Dryopteris erythrosora*): The newly emerging fronds are a copper/brown color.
- Japanese painted fern (*Athyrium nipponicum*): This fern is shorter than most. It is only 12 to 18 inches. It has maroon/silvery fronds that contrast nicely with Hostas.
- Maidenhair fern (*Adiantum pedatum*): This fern is thought to be the most beautiful of the ferns. It has a very delicate texture.

**Foamflower Tiarella sp.**

Foamflowers are native to North America. They are evergreen plants that do well in partial shade to full shade, making them good choices for woodland areas. They spread by rhizome or stolons. Foamflowers prefer moist, well-drained soils. To maintain them, remove dried or dead leaves and topdress with organic soils. Foamflower propagates by seed or by division in the spring or fall. Plants grow to be 6 to 18 inches, depending on the variety. The most common pest problem of these plants is slugs.

**Hemerocallis (hem-er-O-ka-lis)**

*Hemerocallis*, also known as daylilly, has many uses in the landscape because of its durability and versatility. It performs well in full sun or partial shade, the foliage is attractive all summer and the flowers come in an endless selection of colors, shapes and sizes. Also, the clump-forming habit keeps hybrids neat and tidy in the garden. Daylilies are easily propagated and easily shared with a friend by dividing the thick clumps with a spade. Hybridizers have introduced hundreds, or even thousands, of new varieties. Much of the new breeding has been concentrated on developing reblooming varieties: ‘Sella de Oro,’ ‘Happy Returns,’ ‘Going Bananas’ and ‘Vintage Bordeaux’ are just a few. There are also two old species of daylilies that have their place in the garden landscape. *H. fulva*, the tawny daylily, shines its burnt orange flowers along roadsides every year, and *H. lilioasphodelus*, the lemon daylily, has wonderfully fragrant lemon-yellow flowers. Both of these species spread vigorously, thus are more suitable in a naturalized garden, or for covering a bank.

**Heuchera (hU-ker-a)**

*H. sanguinea* is also known as alumroot and coral bells. It is a nice plant to place near a garden path in partial shade. It flowers in late spring with intense, though small, pink to scarlet flowers. Coral bells prefer moist rich soil. There are many varieties of *Heuchera* that are grown for the interesting foliage; the flowers are rather inconspicuous. The foliage of these varieties can be chocolate-brown, purple
or metallic silver. Foliage color fades during the summer, especially if grown in full sun.

**Hosta (hoss-ta)**

Hosta is the most popular perennial for shade. Hosta is similar to daylilies, and hybridizers have introduced hundreds of varieties. Leaf size ranges from very small to very large. Leaf color ranges from gold, to lime, to deep green, to grayish blue. Yellow and white variegated forms can also be found. The variegation may occur in the leaf blade or along the leaf margin. Although usually grown for their foliage, the white or lavender flowers can be attractive and sometimes fragrant. Hostas add a lovely and subtle touch of texture to the shade garden. Hostas prefer moist soils and will tolerate a considerable amount of sunlight, provided enough water is available. However, the foliage color is best in the shade. Snails and slugs are common pests of hostas. When using hostas, remind gardeners to be patient, it takes several years for a newly planted hosta to take on the grandeur of those seen in the catalogues.

**Iberis (I-ber-is)**

*I. sempervirens* is also known as candytuft. It is a common spring flowering perennial known for its white flowers that cover its evergreen foliage. Candytuft prefers full sun and demands well-drained soils. The foliage can get leggy, so trimming the plant about 2 inches after flowering is beneficial. Candytuft fits well into rock gardens or where it is allowed to slowly cascade over walls. It can be propagated from seeds or cuttings taken in midsummer.

**Liatris (ll-a-tris)**

*L. spicata* is also known as spiked gayfeather. It is commonly used in cut-flower arrangements, and can also easily be grown in the home garden. Taller varieties may need staking to prevent the stems from toppling. ‘Kobold’ is a compact variety that performs well in the perennial border. Liatris plants perform best in full sun. It germinates readily from seeds.

**Linum (ll-num)**

*Linum perenne* is also known as blue flax. Blue flax produces azure blue flowers by the hundreds, if not thousands. The flowers are extremely short-lived, often dead by the evening; however, each morning a new display of flowers reappears. Blue flax will flower from spring through mid-summer in partial shade, but absolutely does not tolerate poor drainage. Blue flax is best planted in mass. The wispy, blue foliage provides a soft texture and is pleasantly blown about in a mild breeze.

**Myosotis (ml-O-sO-tis)**

*M. sylvestris* are also known as forget-me-nots. They produce lots of very small, fragrant, blue flowers in the spring. They are best planted in partial shade in moist soil. Although relatively short-lived, they will often re-seed themselves, or a new batch can be started from seed every few years. Forget-me-nots are susceptible to diseases during hot, humid or rainy weather.

**Physostegia (fi-zO-stE-gE-a)**

*Physostegia* is also known as obedient flower. The obedience part of the common name refers to how the individual flowers can be easily bent into submission. Obedient flower can be invasive as it spreads out to take more property for itself each year. The tall spikes of pink or white flowers make nice cut flowers. Obedient flower does well in full sun or partial shade, but may need staking.

**Platycodon (plat-E-cO-don)**

*P. grandiflorus* is also known as balloon flower. It is named after its closed buds, which resemble hot air balloons and prove irresistible to pop. Balloon flowers have rich blue petals. Although easily grown, they prefer some protection from late afternoon sunshine. Balloon flowers often require staking to prevent toppling. Newer varieties are more compact. Pink and white flowers are also available.

**Rudbeckia (red-bek-E-a)**

*R. fulgida* ‘Goldsturm’ is also known as black-eyed Susan. It is a magnificent performer throughout the summer. It is cloaked with many yellow-petaled, black-headed flowers that cover compact, dark green foliage. ‘Goldsturm’ is very easy to find for purchase. It prefers full sun and adequate moisture. ‘Goldsturm’ delivers a big bang for the buck.

**Salvia (sal-vE-a)**

*Salvia* is also known as sage. Perhaps the most widely available perennial *Salvia* is *S. x su-perba*, which is relatively drought tolerant and prefers full sun. This *Salvia* produces numerous spikes of dark blue flowers that reach 2 feet in
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the early summer. *S. leucantha* (Mexican sage), although not hardy, will reach 5 feet and will flower in the early autumn. The blue flowering spikes are velvety soft to touch. This species is propagated from cuttings, not seed.

**Sedum (sE-dum), Stonecrop**

*Sedum* are also known as stonecrops. They make great plants for the rock garden because they do well in full sun and tolerate drought. *S. x ‘Autumn Joy’* is among the most common variety of *Sedum*. It produces dense heads of pinkish flowers that age to bronze-red in the fall. Some gardeners consider the dried flower heads ornamental and leave them on the plants. ‘Autumn Joy’ forms a nice clump and is not as weedy as other *Sedums*. *S. spurium* ‘Dragon’s Blood’ is a low growing sedum that has purplish bronze foliage and dark red flowers in the summer. *S. acre* has tiny succulent leaves and produces many gold flowers. The later two sedums are perhaps best used as groundcovers over hot, dry and undesirable garden sites.

**Stachys (stA-kis)**

*S. byzantina* is also known as lamb’s ears. It has masses of velvety soft, silvery gray foliage that people love to caress. Lamb’s ear is a plant for full sun. Well-drained soils are necessary. There is some dispute over the ornamental qualities of the flowers. Some gardeners remove the flowering spikes so as not to detract from the foliage, while other gardeners enjoy the flowers. Lamb’s ears are easily started from seed.

**Ornamental Grasses**

Ornamental grasses come in many shapes and sizes ranging from 1- to 15-feet tall. Most prefer full sun. Ornamental grasses provide long-term interest in the garden. In the spring and early summer, the new growth billows in the wind. In the late summer and fall, the seeds steal the show. During the late fall and winter, the dried seed heads and foliage make a nice garden accent and lovely rustling sounds in the breeze. The following examples are just a few of the available ornamental grasses.

**Giant Reed Grass *Arundo donax* ‘Variegata’**

Giant reed grass can grow up to 12-to 15-feet tall; therefore, it looks best in a large garden. Very coarsely textured, this plant is striking at 50 yards away. The new growth looks like variegated corn. Later in the summer, the leaves lose their variegated appearance. The stems have been used for woodwind instruments. A great cultivar of giant reed grass is ‘Peppermint Stick.’ Peppermint Stick is desirable because it retains its variegation.

**Blue Fescue (Fesk-ju) *Festuca glauca***

Blue fescue grows up to 6- to 10-inches tall, making it a good choice for an accent plant. It requires good drainage, and will often heave out of the soil during the winter. This can be corrected by stepping on the clump. Blue fescue should not be planted in mass because the plants often vary in size and appearance.

**Miscanthus sinensis**

*M. sinensis* is the most popular ornamental grass for which there are numerous varieties. ‘Gracillimus’ (maiden grass) has narrow leaves and is among the most graceful in habit. ‘Morning light’ also has narrow leaves, but it is variegated. ‘Strictus’ (porcupine grass) and ‘Zebrinus’ (zebra grass) have broader leaves with unique horizontal variegation patterns. ‘Zebrinus’ tends to be floppy and may require staking.
Fountain Grass *Pennisetum alopecuroides*

Varieties of fountaingrass range in height from 1 foot, known as 'Little Bunny', to 2 feet, known as 'Hamlen,' to the normal, 3 to 4 feet species.

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Hardy Bulbs and Bulb-Like Plants

**Crocus (krO-kus)**

*Crocus* is a group of early spring flowering corms belonging to the Iris family. These plants are great for naturalizing in any full sun location, including lawns before mowing commences. They have a few insect and disease pests. In September, *Crocus* should be planted in clumps of six or more, at a depth of 5 inches. If they cease flowering after a few years, they can be lifted, separated and then replanted after the foliage has died back.

**Hyacinths (hl-a-sin-th), Hyacinthus**

*Hyacinthus* is from the genus of a single species of bulbous herb from the Mediterranean region. The bulbs of this spring bloomer are planted in the fall at depths of 5 to 6 inches. Bulbs may need to be replaced every other year to maintain peak blooming. Propagation is by division of bulbs in the fall. Lack of flowers may be due to overcrowding of plants. Bacterial and fungal rots may attack these bulbs if the soil is too wet or too dry. Infected bulbs should be removed and destroyed. If the problem is severe, hyacinths should not be replanted in the infested soil for at least three years.

**Iris (l-iris)**

*Iris* is a large genus of perennial herbs, mainly from the North Temperate Zone. They grow from bulbs, or more commonly, from rhizomes. *Iris* species are broadly divided into bearded and beardless, depending on whether the basal half of the flower sepals has filaments or hairs—a beard. The beardless *Iris* plants are typically perennial plants and suitable for naturalizing. They come from all over the world, including the ‘Flag Iris’ of swampy areas of the eastern United States. Other beardless *Iris* plants include the ‘Siberian Iris’.

In the garden, *Iris* should be planted in the fall in a sunny, protected, well-drained location for spring and early summer blooms. Cutting rhizomes or separating the offsets from the bulbous types may easily propagate them. Problems include a borer that eats cavities into the rhizome, bacteria enters through holes made by the borers, as well as fungal (*Botrytis*)
rhizome rot. The borer can be controlled with the use of insecticides and all infected rhizomes should be removed.

**Lilium (lil-E-um)**

The Lily family is large, and with careful selection, gardeners can have lilies in bloom all summer. They can be planted from autumn until spring; however, fall planting is best, as some species cannot withstand much freezing until well rooted. Bulbs need to be carefully handled to keep any roots and stem intact. Bulbs of stem-rooting lilies should be planted three times as deep below the surface of the ground as the bulb is high. For example, if the bulb is 2 inches high, its bottom should be 6 inches below the ground surface. Those rooting from the base of the bulb require shallower planting. Many lilies prefer full sun, although some keep their color better in partial shade. Most benefit from shading of the young shoots with a ground cover and all require well-drained soil. Lilies should not be disturbed until clumps become too thick. Careful lifting and dividing of small bulbs from the parent bulb and then immediate replanting may be done after flowering. Propagation is also possible by removing bud scales from the parent bulb early in the summer and allowing bulblets to form. The ‘Tiger Lily’ forms its food-storage structures, called bulbils, in the angles of leaves. These fall to the ground and germinate like seeds to produce new plants.

**Narcissus (nar-sis-us)**

The genus Narcissus contains daffodils, jonquils and ‘Paper White’ Narcissus, among others. Bulbs are planted in the fall in time to allow a month of good rooting before the soil gets cold. These plants should be planted one and one-half times as deep as the depth of the bulb itself. Shallow planting causes bulbs to split up quickly into many small, non-flowering offsets. Good drainage is a necessity. If the bulbs need to be divided or moved, it should be done after the foliage has died down. Bulbs should be lifted, dried in the shade and broken apart, without damaging the base. Plants should be replanted at once or stored in a cool, well-ventilated place until fall.

**Scilla (sill-a)**

Scilla is a large genus of bulbous, early spring blooming herbs in the Lily family. They flower prolifically, are easy to grow in sun or partial shade and increase rapidly. Scilla should be planted in early autumn; with bulbs planted three times their own depth in the soil. Scilla can be propagated from bulblets in the autumn. ‘Siberian Scilla’ has a long-lasting flower, tolerates a wide variety of soils and locations, and has no pest or disease problems of note.

**Tulip (tew'-lip)**

Darwin hybrid tulip bulbs are planted in the fall or early winter at a depth of 4 to 8 inches. Tulips prefer full sun and require good soil drainage for best flowering and avoidance of disease problems. Propagation is by division of the bulbs in the fall. Tulips prefer the cool summers of northern Europe and the northern United States. Consequently, hot Tennessee summers spell trouble for tulips. Bulbs purchased and planted in the fall should always produce a showy spring display; however, flowering will diminish each year after. In fact, tulips are often treated as annuals; therefore, they are often dug up and discarded after their first spring show.
Tender Bulbs and Bulb-Like Plants

**Caladium (ca-A-de-um)**

*Caladium* is a tuberous, tropical, native plant that is highly valued for its large, multicolored and patterned leaves. *Caladium* will lighten up a shady corner of the garden. Tubers are lifted in the fall after foliage has died back and stored dry in a cool place for the winter. Division of the tuber easily propagates these plants. They should be planted when the soil has warmed up, after the danger of frost.

**Canna (can-na)**

*Canna* are lilies that are showy, tropical plants that grow 3- to 6-feet tall with 4-inch white, yellow, pink or red flowers. When planting, the tubers should be planted in a warm, sunny spot when the soil has warmed to 65 degrees F. Tubers can be dug up in the fall, when the foliage has been killed by frost. They should be dried for a few days, and then stored as for *Dahlias*. If covered with mulch, *Canna* plants can survive mild Tennessee winters. If plants do survive the winter, the rootstock should be divided in the spring, leaving at least one, but not more than two, buds on each section of tuber.

**Colocasia (Cal-o-ca-sia)**

*Elephant ears, or Colocasia esculenta,* are foliage plants that are grown for their large leaves. The leaves range in size from 1 foot to 8 feet. *Elephant ears* will grow in Tennessee under part shade to full sun with ample soil moisture. Leaf color ranges from green variegated (‘Yellow Splash’) to deep purple (‘Black Magic’). *Elephant ears* are valued for their deep-coarse texture and their acceptance of wet areas in the landscape. They are heavy feeders and need a fertilizer high in nitrogen. Bulbs or corms can be dug and stored in the winter. However, care should be taken to assure that they do not get dried out. Corms or bulbs should be planted after the danger of frost has past. Taro is the name used when referring the to the plant’s edible root, or corm, resembling sweet potato flavor.
**Dahlia (da-E-a)**

*Dahlia* are tender, tuberous-rooted plants that grow from 2- to 8-feet tall with 1- to 18-inch summer flowers. Staking of the taller varieties is often required. Being very tender, *Dahlia* roots should be dug prior to the first heavy frost. Before storing in a cool, dark space, plant debris and soil should be removed from all roots. Similarly, tubers should be carefully dug in the fall, dried for a couple hours and stored moist at 35 to 40 degrees F. Separating tubers in the spring at planting time, with one strong bud on each tuber, is the usual method of propagation. Replanting of roots should be done in full sun with constant and adequate moisture to assure uninterrupted blooming. Pests include several borers that invade the stem.

**Gladiolus (glad-E-ol-us)**

Gladioli are summer blooming members of the Iris family grown from corms. They are easy to grow and make long-lasting cut flowers. Staking is often necessary. Succession of blooms for a period of several months can be achieved by planting corms in a sunny spot every two weeks between May and July, or until 90 days to the first killing frost. Depth of planting is determined by corm size; however, deep planting helps hold large plants erect and prevents corms from splitting or producing many small cormels. After blooming, the foliage stays green for a long time and requires continued watering. After foliage dies back, and before a heavy frost, the corms should be lifted and dried. Then, the foliage should be cut off stored in a dry and cool location, 40 to 45 degrees F, over the winter. Gladioli are easily propagated by cormlets found at the base of the old corm when lifted. These generally take two to three years to produce flowers.

**Vines and Climbing Plants**

**Clematis (Clem-a-tis or cle-mat-is)**

*Clematis* spp., also called virgin’s bower, is a group of perennial vines that include wild species and large-flowered hybrids. The wild types have less showy single, cup- or bell-shaped flowers. These types are generally easier to establish and are more vigorous. All types of *Clematis* are hardy, woody climbers with twining petioles that require support. They like moist, rich soil in a sunny location. It is advisable to mulch soil around the roots, or to underplant with a shallow-rooted ground cover to protect the roots from the heat of summer. Flowers range from the simple bell-shaped of the wild types, such as *C. Tangutica*, to the showy blossoms of some hybrids. Colors include white, yellow, pink, red and purple. Pruning is unnecessary for early-season flowering to remove dead wood. Late-season types flower on new wood and are cut back hard in late winter or early spring. Softwood cuttings propagate *Clematis* hybrids. True species may be propagated from seed.

**Hyacinth Bean Dolichos lablab**

Hyacinth bean is in the Pea family. It is also known as lablab bean, Indian bean or Bonavista vine. It is semi-hardy and tendrilled. It is a perennial climber that is usually grown as an annual. Seed sown in the spring produces vigorous 10- to 30-foot vines that carry decorative triangular maroon leaflets. The tall racemes of typical pea flowers are lilac to purple and have white blossoms in mid-summer. After flowering, the vines bear attractive shiny purple pods containing edible black and white bean-like seeds. Like all plants of the pea family, hyacinth bean prefers rich soil in a sunny location.

**Passionflower (Passiflora spp.)**

Passionflowers are woody, tendrilled climbing vines with short-lived, summer flowers that are 2 to 4 inches across. The unique flowers appear in white, pink or purple. Passionflower vines may grow to 15 to 30 feet and have naturalized in parts of Tennessee. Some species produce edible fruits, the passionfruit, in warm areas. Passionflowers require well-drained soils and warm, sunny spots. A trellis is necessary for support and these plants need to be watered well in the summer. Passionflower plants generally die to the ground in the winter. Plants can be propagated from softwood cuttings or seed. In warmer climates, such as West Tennessee, passionflower may be considered an invasive weed. It is also known as maypop.
Moonflower *Ipomoea alba*

Moonflower is a tender perennial of the Morning-glory family that is often grown as an annual. The milky-juiced, somewhat prickly stems grow to 10 feet and bear fragrant, night-blooming, white flowers that are 5 to 6 inches across. Moonflower was a favorite subject of the painter Georgia O’Keefe. Moonflower is highly toxic and can be invasive.

Sweet Pea *Lathyrus odoratus*

Sweet peas are annual, tendrilled climbers that have fragrant, delicate flowers. Sweet peas make a colorful 6- to 10-foot screen and will flower as long as the plant is dead-headed, and night temperatures drop into the mid-60 degrees F. Seeds should be sown in the spring or autumn in rich, neutral or alkaline soils in a sunny spots. Heat-resistant, dwarf and semi-dwarf varieties are sold that do not require support. These plants are suggested for container plantings.
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**Plants used for dried flowers/fruits**

**Annuals**
- Winged everlasting (*Ammobium*)
- Cocks comb (*Celosia*)
- Globe amaranth (*Gomphrena*)
- Love-In-A-Mist (*Nigella*)
- Strawflower (*Helichrysum*)*

**Perennials**
- Baby’s breath (*Gypsophila*)
- Chinese lantern (*Physalis*)
- Lavender (*Lavandula*)
- Money plant (*Lunaria*)
- Pearly everlasting (*Anaphalis*)
- Perennial statice (*Limonium*)*
- Yarrow (*Achillea*)*

**Plants suitable for cut flowers**

**Annuals**
- Bachelor’s button (*Centaurea*)
- Cosmos (*Cosmos bipinnatus and C. sulphureus*)
- Dahlias
- Mealy blue sage (*Salvia farinacea*)
- Snapdragons (*Antirrhinum*)
- Sunflowers (*Helianthus*)
- Sweet peas (*Lathyrus odoratus*)
- Zinnia (*Zinnia elegans and Z. angustifolia*)

**Perennials**
- Astilbe
- Crocosmia
- Obedient plant (*Physiostegia*)
- Peony (*Paeonia*)
- Shasta daisy (*Chrysanthemum*)
- Spiked gayfeather (*Liatris*)
- Tickseed (*Coreopsis*)*

**Plants used in containers, window boxes and hanging baskets**

**Annuals**
- Paper flower (*Bougainvillea*)
- Diplodinia
- Fan flower (*Scaevola*)
- Geraniums (*Zonal, Ivy and Scented*)
- Mandevilla
- Nasturtium (*Tropaeolum majus*)
- New Guinea impatiens (*Impatiens*)
- Ornamental sweet potatoes (*Ipomoea batatas*)
- Pansies (*Viola x wittrockiana* and *V. tricolor*)
- Spikes (*Draceana*)

**Perennials**
- Variegated vinca vine (*Vinca major*)*
- English ivy (*Hedera helix*)*
- Creeping fig (*Ficus pumila*)

**Plants suitable for shade**

**Annuals**
- Begonia
- Browallia
- Elephant ear (*Caladium*)
- Coleus
- Impatiens
- Torenia

**Perennials**
- Astilbe
- Bleeding heart (*Dicentra*)
- Black snakeroot (*Cimicifuga*)
- Columbine (*Aquilegia*)
- European ginger (*Asarum*)
- Ferns
- Hosta
- Deadnettle (*Lamium*)
- Lungwort (*Pulmonaria*)
- Sweet woodruff (*Galium*)
- Virginia blue bells (*Mertensia*)
Helpful Herbaceous Plant Lists

*Denotes drought tolerant plants

Plants for sunny and relatively dry locations

**Annuals**
- Bachelor's buttons (*Centaurea*)
- Cockscomb (*Celosia*)
- Cosmos
- Creeping zinnia (*Sanvitalia*)
- Dusty miller (*Centaurea cineraria*)
- Treasure flower (*Gazania*)
- Globe amaranth (*Gomphrena*)
- Gloriosa daisy (*Rudbeckia hirta*)
- *Melampodium*
- Moss rose (*Portulaca*)
- Rosemary (*Rosemaryinus officinalis*)
- *Salvia farinacea*
- Vinca (*Catheranthus*)
- *Zinnia* (*Zinnia legans & Z. linearis*)

**Perennials**
- Wormwood (*Artemisia*)
- Black-Eyed Susan (*Rudbeckia*)
- Blanket flower (*Gaillardia*)
- Butterfly weed (*Asclepias*)
- *Gaura lindheimeri*
- Globe thistle (*Echinops*)
- Hens and chicks (*Sempervivum*)
- Lamb's ears (*Stachys*)
- Lavender (*Lavandula*)
- Purple coneflower (*Echinacea*)
- Russian sage (*Perovskia*)
- Stonecrop (*Sedum*)
- Yarrow (*Achillea*)

Plants suitable for moist/wet conditions

**Annuals**
- Ageratum
- Begonia
- Impatiens
- New Guinea impatiens (*Impatiens 'New Guinea')

**Perennials**
- Black snakeroot (*Cimicifuga*)
- Cardinal flower (*Lobelia*)
- Horsetails (*Equestum*)
- Iris Tall bearded (*Iris pallida*)
- Obedient plant (*Physosestegia*)
- Japanese knotweed (*Polygonum*)
- Primrose (*Primula*)
- Rodgersia
- Spiderwort (*Tradescantia*)

Plants used for groundcovers

**Annuals**
- Creeping zinnia (*Sanvitalia*)
- Moss rose (*Portulaca*)
- 'Purple Wave' petunia (*Petunia grandiflora*)
- Fan flower (*Scaevola*)

**Perennials**
- Bishop's weed (*Aegopodium*)
- Bugle weed (*Ajuga*)
- Chameleon plant (*Houttuynia*) *This plant can be invasive and should be used with caution*
- Creeping myrtle (*Vinca*)
- Dead nettle (*Lamium*)
- English ivy (*Hedera*)
- Lily Of The Valley (*Convallaria*)
- *Liriope*
- Monkey grass (*Liriope*)
- Pachysandra
- Sweet woodruff (*Gallium*)
### Plants for large spaces

**Annuals**
- Canna lilies (*Canna × generalis*)
- Castor beans (*Ricinus*)
- Spider flower (*Cleome*)
- Sunflowers (*Helianthus annuus*)

**Perennials**
- Giant reed grass (*Arundo*)
- Goat’s beard (*Aruncus*)
- Plume poppy (*Macleaya*)
- Rose mallow (*Hibiscus*)
- Verbena bonariensis

### Plants for variegated foliage

**Annuals**
- *Coleus*
- Polka dot plant (*Hypoestes*)
- Swedish ivy, Swedish begonia (*Plectrantus*)

**Perennials**
- Bishop’s weed (*Aegopodium*)
- *Leucanthemum pacificum*
- Hosta
- Lungwort (*Pulmonaria*)
- Ornamental grasses
- Silver thyme (*Thymus*)

### Plants grown for texture

**Annuals**
- Castor bean (*Ricinus*)
- Hollyhock (*Alcea*)
- *Colocasia sp. or Musa*
- Elephant ear (*Caladeum*)
- Angelwing begonia (*Begonia coccinea*)
- *Wooly mullein (Verbascum thapsus)*

**Perennials**
- Blue flax (*Linum*)
- *Bergenia*
- False Forget-Me-Not (*Brunnera macrophylla*)
- Cardoon (*Cynara cardunculus*) *
- *Canna spp.*
- Ferns
- Hellebore
- Hosta
- Joe-Pye weed (*Eupotorium maculatum*)
- Lady’s mantle (*Alchemilla*)
- Ornamental grasses
- Yucca

### Plants with colorful foliage

**Annuals**
- Burgundy fountain grass
- Elephant ear (*Caladeum*)
- *Coleus*
- Dusty miller (*Centaurea cineraria*)
- Joseph’s coat (*Amaranthus tricolor*)
- Purple-Leaved basil

**Perennials**
- Artemisia
- Chamelecon plant (*Houttuynia*) *This plant can be invasive and should be used with caution*
- Herman’s pride (*Lamiastrum*)
- Huster red (*Penstemon*)
- Sea holly (*Eryngium*) *
- Purple heart (*Setcreasea pallida*)
## Summary

The pleasure that a flower garden can bring is endless. Therefore, to help bring joy to gardening endeavors, it is important to understand the concepts presented in this chapter. Specifically, in this chapter, you have learned about growing herbaceous plants, examined the basic requirements of herbaceous plants, learned how to design gardens with herbaceous plants, looked at growing cycles of herbaceous plants and learned about the different aspects about specialty gardening.

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### Plants for fragrance

<table>
<thead>
<tr>
<th><strong>Annuals</strong></th>
<th><strong>Perennials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flowering tobacco (<em>Nicotiana</em>)</td>
<td>Lavender (<em>Lavendula</em>)</td>
</tr>
<tr>
<td>Cherry pie (<em>Heliotrope</em>)</td>
<td>Lilies</td>
</tr>
<tr>
<td>Sweet Allysum (<em>Lobularia maritime</em>)</td>
<td>Lily-Of-The-Valley (<em>Convallaria</em>)</td>
</tr>
<tr>
<td>Sweet peas (<em>Lathyrus odoratus</em>)</td>
<td>Peonies (<em>Paeonia</em>)</td>
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<td></td>
<td>Pinks (<em>Dianthus</em>)</td>
</tr>
</tbody>
</table>

### Attracting butterflies and hummingbirds

<table>
<thead>
<tr>
<th><strong>Annuals</strong></th>
<th><strong>Perennials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bee plant, Bee bed (<em>Borage</em>)</td>
<td>Bee balm (<em>Monarda</em>)</td>
</tr>
<tr>
<td>Fuchsia</td>
<td>Butterfly bush (<em>Buddleia</em>)</td>
</tr>
<tr>
<td>Cherry pie (<em>Heliotrope</em>)</td>
<td>Butterfly weed (<em>Asclepias</em>)*</td>
</tr>
<tr>
<td>Sage (<em>Salvia coccinea</em>)</td>
<td>Sage (<em>Salvia</em>)*</td>
</tr>
<tr>
<td></td>
<td>Brazilain verbena (<em>Verbena bonariensis</em>)</td>
</tr>
</tbody>
</table>

### For children

- Giant pumpkins (*Cucurbita maxima*)
- Gourds
- Vegetable
- Snapdragons (*Antirrhinum majus*)

### Rock garden

<table>
<thead>
<tr>
<th><strong>Annuals</strong></th>
<th><strong>Perennials</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Moss rose (<em>Portulaca</em>)*</td>
<td>Blue-Eyed grass (<em>Sisichrynchium</em>)</td>
</tr>
<tr>
<td>Sweet Allysum (<em>Lobularia maritime</em>)</td>
<td><em>Dianthus</em></td>
</tr>
<tr>
<td></td>
<td>Hens and chicks (<em>Sempervivum</em>)*</td>
</tr>
<tr>
<td></td>
<td>Santolina*</td>
</tr>
<tr>
<td></td>
<td><em>Sedum spp.</em></td>
</tr>
<tr>
<td></td>
<td>Thyme (<em>Thymus vulgaris</em>)*</td>
</tr>
</tbody>
</table>

*Denotes drought tolerant plants
Terms To Know

- Bulbets
- Bulbils
- Cultivar
- Cut back
- Deadhead
- Dividing
- Dieback
- Drift
- Edging
- Pinching
- Rootbound
- Slow release fertilizers
- Water-soluble fertilizers

Test Your Knowledge

1. Explain the main differences between annuals, biennials, and perennials?
2. In site preparation, what should one consider when spacing plants?
3. What are some special challenges that gardeners in the mid-south must face?
4. What are some things to keep in mind when putting warm colors such as red and yellow in your landscape garden?
5. What are some important things to keep in mind when establishing a wildflower garden?

Resources

- Butterfly Gardening and Children's Gardening
  Resources at the National Gardening Association
  kidsgardening.com
- Hunter, Margie. *Gardening With Native Plants.*
  gardeningwithnativeplants.com
- Lady Bird Johnson Wildflower Center
  University of Texas at Austin
  wildflower.org
- Perennial Plant Association
  perennialplant.org
- Tennessee Native Plant Society, Department of Botany at The University of Tennessee
  tnps.org
- University of Tennessee Extension Publication Website
  utextension.tennessee.edu