

UNIT 26

PERENNIALS, ORNAMENTAL GRASS, VINES, BAMBOO, AND PRAIRIE GARDENS

OBJECTIVE

To design, plant, and maintain a perennial garden.

KEY TERMS

accent
fragrances
hardiness
hybridized
massing
perennials

COMPETENCIES TO DEVELOP

After studying this unit, you should be able to:

- list five perennial flowers.
- design a layout for a perennial border.
- list the environmental factors that affect perennial gardens.
- list three ornamental grasses, vines, and bamboo.

MATERIALS

- sources of color pictures of annuals, such as nursery catalogs
- seed flats and growing medium in which to start plants
- seed and nursery catalogs (one for each two students)
- planting area in which to design a flower bed, using annuals
- all necessary ingredients for preparation of flower beds (peat moss, fertilizer, etc.)

Perennials

Perennials are plants that live from year to year and therefore do not require replanting. The tops may or may not die back in the winter or dry season. Some perennials bloom their first year, but most produce larger, more attractive flowers and develop stronger root systems in successive seasons. Perennials may be small flowering plants, shrubs, or flowering trees. Flowering trees are called *hardy perennials*. A *herbaceous perennial* is a nonwoody plant that lives from year to year but dies back to the ground each winter and grows back the following spring (e.g., hosta, hollyhocks, and daylilies).

Perennials have made a resurgence in the United States in the past several years, and there are many hardy perennials that are native to this country. The demand for perennials has expanded with the growing interest of the general public in gardening and landscaping and the desire to accent with plants that will come back each year. Perennials adorn gardens with color and foliage, and they result in a long-term garden meant to be enjoyed. This interest in perennials has even resulted in the formation of the Perennial Plant Association, which each year selects a “Perennial Plant of the Year.”

Many of the early perennial gardens contained the old favorites such as chrysanthemums, daylilies, irises, peonies, and delphiniums. Many of these plants have been in borders for over 100 years. With the introduction of new cultivars, perennials have been **hybridized** to give a variety of colors, forms, textures, **fragrances**, and **hardiness**. Europeans have always been strong in the use of perennials in their gardens, and they have introduced many of the new cultivars. As we learn more about these perennials and their uses, demand for them will grow.

As densely populated areas continue to grow and townhouses become more popular, modern perennial gardens are becoming smaller. With this scaled-down approach to landscaping, perennial plants have become an outdoor extension of indoor living, featuring unique color design that creates a special relationship with nature and the environment.



GREEN TIP

Perennials, ornamental grasses, vines, bamboo, and prairie gardens help to reduce the environmental impact of our ecosystem by regenerating the biomass of plant material resources to improve our biological system. Ornamental grasses, for example, are being sought after to produce alternative fuels. Also, vines are employed to ecologically conserve energy through heating and cooling buildings with the use of vertical gardens and rooftop gardens.

Perennial Beds and Location

The perennial bed should be first designed on paper to fit the garden area for a particular bed. Some basic guidelines to follow are the following:

1. Use an island bed with an informal-shaped border, surrounded with a lawn area. The taller plants are planted in the center, with the design using a sequence of tall-to-short plants, with the shortest plants on the outer edge. The bed should be 5 feet wide. This will allow the individual to work the garden from all sides without walking over the bed. With the resulting reduction in soil compaction, damage to the plant roots will be minimal, thus lowering maintenance requirements. If a walkway through the bed is part of the design, then the size of the garden may be from 9 to 15 feet wide.
2. Use a perennial border planted along a fence or property line as a divider. It should be up to 5 feet wide and as long as desired by the designer and the gardener.

SOIL, LIGHT, AND VIEW When planting a perennial bed, one must consider other factors such as environment, soil type, drainage, depth of the topsoil, organic matter content, and light exposure (full sun, partial shade, or full shade). The view from the house, patio, or lawn will also have a bearing on the location of the perennial bed or border.

Organic matter resources are peat moss, pine bark fines, composted leaves and grass (Leafgro), composted sewage sludge, composted animal



manure, and other horticultural biosolids. Using additional organic matter mixed with the soil will improve the chemical reaction of the soil media known as the cation exchange capacity.

Selection

Perennials should be selected by personal preference, color scheme, texture, shape, growth habit, and the microclimate of the local area. Examine plants grown in the area or ask for advice from a nursery or garden center, extension service, or horticultural instructor. The color pictures in seed and nursery catalogs are another source that can be helpful in plant selections. Check Figure 26-1 to determine whether the plants selected will grow under the light and soil conditions in the area in which they are to be planted and to be sure they will bloom during the season when added color is needed in the landscape (mid-spring, late summer, and fall). Plant flowers that bloom at the same time together for the best display of color.

When one chooses plants, it is important to **mass** varieties in groups of three, five, nine, or more. A single variety of perennial may be used as long as the growth is full. For example, the use of daylilies as a single variety is good because they tend to grow in a clump and have several flowers blooming at one time. Plants with small growth habits should not be used individually as they give a sparse appearance in the garden.

To concentrate on early color, one must consider the use of spring-flowering bulbs. No perennial garden should be without some small, early flowering bulbs that multiply freely over the years. Some bulbs that can be used are the grape hyacinth, snowdrop, and crocus. Another variety to use is the lovely miniature iris (*Iris reticulata*) with fragrant purple flowers that appear in March. Daffodils are also important to color an early spring perennial garden.

Designing a Perennial Garden

In today's world of landscape design, computer-aided design (CAD) in a three-dimensional image is used by some designers to showcase perennial gardens. This process of three-dimensional imaging allows the designer to create

picturesque gardens for the client. The client can then see what the garden will look like when it starts to grow and flower.

To design the perennial garden, you must consider the soil, time of blooming, and space, and have a plant list, including the colors and varieties that are best suited for your geographic area. Using design equipment such as a T-square, a triangle, architect's scales, a #2 pencil, and a drafting board, lay out the desired perennial garden for the area. Keep in mind the height, color, and spread of the plants. A recommended rule to follow for planting distance is to have perennials planted at one-half of the mature height of the plant. For example, if a plant grows to 3 feet, then the distance between plants should be 18 inches O.C. (on center) (Figure 26-2, page 308).

In designing the perennial garden, the use of some deciduous shrubs as well as evergreens creates interest. The shrubs create a background for, and contrast with, the perennials.

You could also implement the border design that Gertrude Jekyll (an artist and gardener of the 1800s) used. She was interested in perennials and in using them in borders. She had the unique ability to blend and contrast perennials having different sizes, shapes, and foliage. She did not limit her gardens to the use of perennials only, but worked with biennials and annuals as well. In designing the garden, she would create a sequence of blooming flowers from spring to fall by arranging the garden on a north-south axis, using blue flowers (cool colors) on the north end, moving south, yellow and then red flowers (warm colors). About halfway down the garden the colors reversed to range back to the blues (cool colors) at the opposite (south) end of the garden.

Soil Preparation and Fertilizing

Remember that perennials live in the same soil for more than 1 year. It is necessary, therefore, to prepare the soil well. It will then provide medium conducive to root development. Organic matter should be dug in and drainage improved if necessary. Adequate fertilizer should be dug into the soil along with the organic matter to a depth of at least 1 foot. When the bed is being prepared, use 2 pounds of 5-10-10 (commercial fertilizer) or 3 pounds of bone meal (organic fertilizer) or 2 pounds of 14-14-14 (time-release fertilizer) per

| NAME | WHEN TO PLANT SEED | EXPOSURE | GERMINATION TIME (DAYS) | SPACING | HEIGHT | BEST USE | COLOR | REMARKS |
|---|---------------------------------------|---------------|-------------------------|---------|---------|---|--------------------------|--|
| <i>Achillea millefolium</i> (yarrow) | early spring or late fall | sun | 7-14 | 36" | 24" | borders, cut flowers | yellow, white, red, pink | Seed is small. Water with a mist. Easy to grow. |
| <i>Alyssum saxatile</i> (golddust) | early spring | sun | 21-28 | 24" | 9"-12" | rock garden, edging, cut flowers | yellow | Blooms early spring. Good in dry and sandy soils. |
| <i>Anchusa italica</i> (alkanet) | spring to September | partial shade | 21-28 | 24" | 48"-60" | borders, background, cut flowers | blue | Blooms June or July. Refrigerate seed 72 hours before sowing. |
| <i>Anemone pulsatilla</i> (windflower) | early spring or late fall for tuberos | sun | 4 | 35"-42" | 12" | borders, rock garden, potted plant, cut flowers | blue, rose, scarlet | Blooms May and June. Is not hardy north of Washington, DC. |
| <i>Anthemis tinctoria</i> (golden daisy) | late spring outdoors | sun | 21-28 | 24" | 24" | borders, cut flowers | yellow | Blooms midsummer to frost. Prefers dry or sandy soil. |
| <i>Arabis alpina</i> (rock cress) | spring to September | light shade | 5 | 12" | 8"-12" | edging, rock garden | white | Blooms early spring. |
| <i>Armeria maritima alpina</i> (sea pink) | spring to September | sun | 10 | 12" | 18"-24" | rock garden, edging, borders, cut flowers | pink | Blooms May and June. Plant in dry sandy soil. Shade until plants are well established. |
| <i>Aster alpinus</i> (hardy aster) | early spring | sun | 14-21 | 36" | 12"-60" | rock garden, borders, cut flowers | white | Blooms June. |
| <i>Astilbe arendsii</i> (false spirea) 'Europa' 'Fanal' 'Deutschland' 'Superba' | early spring | sun | 14-21 | 24" | 12"-36" | borders | pink, red, white | Blooms July and August. Gives masses of color. |

FIGURE 26-1 Various flowering perennials. (From U.S. Department of Agriculture Bulletin 114) (continued)



| NAME | WHEN TO PLANT SEED | EXPOSURE | GERMINATION TIME (DAYS) | SPACING | HEIGHT | BEST USE | COLOR | REMARKS |
|---|-------------------------------------|----------------------|-------------------------|---------|---------|--|--------------------------|--|
| <i>Begonia evansiana</i> (hardy begonia) | summer in shady, moist spot | shade | 12 | 9"-12" | 12" | flower bed | yellow, pink, white | Blooms late in summer. Can be propagated from bulblets in leaf axils. |
| <i>Bergenia purpurascens</i> (bergenia) | late winter | light shade | 10 | 18" | 2'-3' | herb | pink, red | Hummingbirds love it. |
| Candytuft (<i>Iberis</i>) | early spring or late fall | sun | 20 | 12" | 10" | rock garden, edging, ground cover | white | Blooms in late spring. Prefers dry places. Cut faded flowers to promote branching. |
| Canterbury bells (<i>Campanula medium</i>) | spring to September (Do not cover.) | partial shade | 20 | 15" | 24"-30" | borders, cut flowers | white, pink, blue | Divide mature plants every other year. Best grown as a biennial. |
| Carnation (<i>Dianthus caryophyllus</i>) | late spring | sun | 20 | 12" | 18"-24" | flower bed, borders, edging, rock garden | pink, red, white, yellow | Blooms in late summer. Cut plants back in late fall and hold in cold frame. |
| <i>Cerastium tomentosum</i> (snow-in-summers) | early spring | sun | 14-28 | 18" | 6" | rock garden, ground cover | white | Blooms in May and June. Forms a creeping mat and is a fast grower. Prefers a dry spot. |
| Chinese lantern (<i>Physalis alkekengi</i>) | late fall | sun | 15 | 36" | 24" | borders, specimen plant | orange | Lanterns are borne the second year in the fall. |
| Colubine (<i>Aquilegia</i>) | spring to September | sun or partial shade | 30 | 12"-18" | 30"-36" | borders, cut flowers | wide color range | Blooms in late spring. Best grown as a biennial. |
| <i>Coreopsis lanceolata</i> | early spring | sun | 5 | 30" | 24" | borders | yellow | Blooms from June to fall if old flowers are removed. |

FIGURE 26-1 Various flowering perennials. (From U.S. Department of Agriculture Bulletin 114)



| NAME | WHEN TO PLANT SEED | EXPOSURE | GERMINATION TIME (DAYS) | SPACING | HEIGHT | BEST USE | COLOR | REMARKS |
|--|-----------------------------|----------------------|-------------------------|---------|---------|---|--------------------------------|--|
| Daisy, Shasta (<i>Chrysanthemum maximum</i>) | early spring to September | sun | 10 | 30" | 24"–30" | borders, cut flowers | white | Blooms June and July. Best grown as a biennial in well-drained location. |
| <i>Delphinium elatum</i> (delphinium) | spring to September | sun | 20 | 24" | 48"–60" | borders, background, cut flowers | blue, lavender, white, pink | Blooms in June. Best grown as a biennial. Needs dry location. |
| <i>Dianthus deltooides</i> (pink) | spring to September | sun | 5 | 12" | 12" | borders, rock garden, edging, cut flowers | pink | Blooms in May and June. Best grown as a biennial. Needs dry location. |
| <i>Echinacea purpurea</i> (coneflower) | spring to September | sun | 20 | 30" | 30"–36" | borders, flower bed, cut flowers | white, pink, red, rose, purple | Blooms midsummer to fall. Shade summer plantings. Attracts butterflies. Deer resistant. Accent specimen massing. |
| Foxglove (<i>Digitalis purpurea</i>) | spring to September | sun or partial shade | 20 | 12" | 48"–60" | borders, cut flowers | pink, white, purple, rose | Blooms in June and July. Grown as a biennial. Shade summer plantings. |
| <i>Gaillardia grandiflora</i> (gaillardia) | early spring or late summer | sun | 20 | 24" | 12"–30" | borders, cut flowers | scarlet, yellow | Blooms from July until frost. |
| <i>Gypsophila paniculata</i> (baby's breath) | early spring to September | sun | 10 | 48" | 24"–36" | borders, cut flowers, drying | white, pink | Blooms early summer until early fall. Needs lots of lime. |
| <i>Hemerocallis</i> (daylily) | late fall | sun or partial shade | 15 | 24"–30" | 12"–48" | borders, among shrubbery | pink, red | Plant several varieties for longer blooming season. |
| <i>Hibiscus moscheutos</i> (mallow rose) | spring or summer | sun or partial shade | 15 or longer | 24" | 36"–96" | background, flower bed | white, pink, red, rose | Blooms July to September. |

FIGURE 26–1 Various flowering perennials. (From U.S. Department of Agriculture Bulletin 114) (continued)



| NAME | WHEN TO PLANT SEED | EXPOSURE | GERMINATION TIME (DAYS) | SPACING | HEIGHT | BEST USE | COLOR | REMARKS |
|--|---|----------------------|-------------------------|---------|---------|----------------------------------|---|--|
| Iris | bulbs or rhizomes in fall | sun or partial shade | next spring | 18"–24" | 3"–30" | borders, cut flowers | blue, red, yellow, pink, bronze, wine varieties are used. | Blooms spring and summer if different varieties are used. |
| <i>Liatis pycnostachya</i> (gayfeather) | early spring or late fall | sun | 20 | 18" | 24"–60" | borders, cut flowers | rose-purple | Blooms summer to early fall. Easily started from seed. |
| <i>Lupinus polyphyllus</i> (lupine) | early spring or late fall (Soak before planting.) | sun | 20 | 36" | 36" | borders, cut flowers | white, yellow, pink, rose, red, blue, purple | Blooms most of summer. Needs excellent drainage. Does not transplant easily. |
| <i>Mentha</i> ssp. (mint) | late winter | sun | 8 | 15" | 6"–3' | culinary | white | Mint flavors. |
| Peony (<i>Paeonia</i>) | Plant tubers in late fall 2"–3" deep. | sun | variable | 36" | 24"–48" | borders, cut flowers, flower bed | pink, red, white, rose | Blooms late spring. Difficult to grow from seed. |
| <i>Phlox paniculata</i> (summer phlox) | late fall or early winter | sun | 25 irregular | 24" | 36" | borders, cut flowers | red, pink, blue, white | Blooms early summer. Color of flower varies. |
| <i>Phlox subulata</i> (moss phlox) | grown from stolons | sun | 8" | 8" | 4"–5" | borders | blue, red, white, pink | Blooms in spring. Drought resistant. |
| Poppy, Iceland (<i>Papaver nudicaule</i>) | early spring | sun | 10 | 24" | 15"–18" | borders, cut flowers | white, pink, red | Blooms early summer. Does not transplant easily. |
| Poppy, Oriental (<i>Papaver orientale</i>) | early spring | sun | 10 | 24" | 36" | borders, cut flowers | pink, red, rose, orange, white, salmon | Blooms early summer. Does not transplant easily. |
| Primrose (<i>Primula polyantha</i> and <i>Primula veris</i>) | January, in a flat on surface. Allow to freeze; then bring in to germinate. | partial shade | 25 irregular | 12" | 6"–9" | rock garden | white, yellow, pink, red, blue | Blooms April and May. May be seeded in fall. |

FIGURE 26-1 Various flowering perennials. (From U.S. Department of Agriculture Bulletin 114)



| NAME | WHEN TO PLANT SEED | EXPOSURE | GERMINATION TIME (DAYS) | SPACING | HEIGHT | BEST USE | COLOR | REMARKS |
|--|---------------------------|--------------------|-------------------------|---------|---|--|---|--|
| <i>Pyrethrum roseum</i> (painted daisy) | spring to September | sun | 20 | 18" | 24" | borders, cut flowers, accent | various, including gold, pink, and lavender | Blooms May and June. Prefers well-drained soil. |
| <i>Rudbeckia fulgida</i> , (pot of gold) | midsummer to September | sun, partial shade | 20 | 30" | 30"–36" | borders, flower bed, cut flowers, accent | | Specimen attracts butterflies. Easy to grow. Deer and rabbit resistant. Wild flower. |
| <i>Salvia</i> (<i>Salvia azurea grandiflora</i> and <i>Salvia farinacea</i>) | spring | sun | 15 | 18"–24" | 36"–48" | borders | red | Blooms August until frost. |
| Sea lavender (<i>Limonium latifolia</i>) | early spring | sun | 15 | 30" | 24"–36" | flower bed, cut flowers, drying | pink, yellow, mauve | Blooms in July and August. |
| <i>Sedum spectabile</i> (sedum) | late winter | sun | 10 | 10" | 4"–15" | groundcover | pink, white | Fall foliage. |
| <i>Stokesia cyanea</i> (Stokes' aster) | early spring to September | sun | 20 | 18" | 15" | borders, cut flowers | white, blue | Blooms in September if started early. |
| Sweet pea (<i>Lathyrus latifolius</i>) | early spring | sun | 20 | 24" | 60"–72" | background | pink, white, purple, red | Blooms June to September. Easily grown as a vine on fence or trellis. |
| Sweet William (<i>Dianthus barbatus</i>) | spring to September | sun | 5 | 12" | 12"–18" (Dwarf form also available.) | borders, edging, cut flowers | red, pink, white | Blooms May and June. Very hardy. Needs well-drained soil. |
| <i>Veronica spicata</i> (speedwell) | spring to September | sun | 15 | 18" | 18" | borders, rock garden, cut flowers | purple | Blooms June and July. Easy to grow. |

FIGURE 26-1 Various flowering perennials. (From U.S. Department of Agriculture Bulletin 114) (continued)



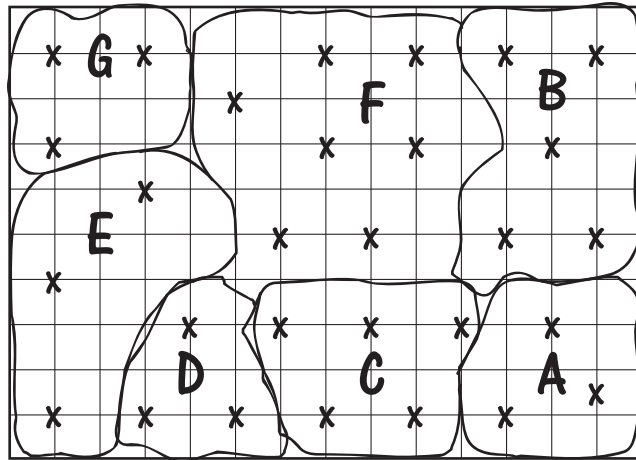
(D) Coreopsis—early sunrise



(G) Pennisetum ornamental grass



(A) Sedum stonecrop



SCALE: 2 BLOCKS = 1'



(F) Rudbeckia Compter's gold



(B) Hollyhock



(C) Veronica



(E) Liatris floristan

Courtesy of Ball Horticultural Co.

FIGURE 26-2 A perennial garden plan



100 square feet of bed. The use of time-release fertilizer will ensure the availability of nutrients for the entire growing season. These fertilizers are readily available through green industry suppliers. A soil test analysis should be performed on each bed every year. Each applicator should follow the soil test recommendations for the correct amount of fertilizer each year. Careful preparation prior to planting results in a much more attractive floral display.

Mulching a Perennial Flower Bed

The use of mulch for a perennial bed is multifaceted. It creates the aesthetics that enhance the perennial planted. It is a source of organic matter for the plants, helps to control weeds, conserves moisture, and promotes even ground temperatures for improved plant growth.

When planting a perennial flower bed it is best to apply a 2- to 3-inch layer of mulch before the bed is planted. This will allow for more even distribution of mulch as well as reducing mulching time for the planted bed.

Some of the more common mulches used in the industry today include hardwood bark, pine bark, cocoa bean hulls, buckwheat hulls, pine needles, well-rotted sawdust, and leafmold. A precaution when using some of these mulches is that they will influence the pH level of the soil. Therefore, it is important that the soil pH level is followed closely to ensure that the optimum growth medium is provided for the plants.

Transplanting

Perennials are transplanted in the spring or the fall. When they are transplanted, the crown of the plant must be at the correct level. (The *crown* is the point where the top is connected to the roots, and where the new growth comes from.) Be sure the crown is set at the original depth; as the plant is set, firm in around the roots with your hands. Water to settle the soil in place, and to prevent drying out of the roots. If the plants flower in the spring, they should be divided and replanted in the fall. If they flower in the fall, they should be divided and transplanted in the spring (Figure 25–11).

It is usually best to start perennial seeds indoors 6 to 8 weeks prior to the transplanting date. Plants that do not transplant well must be

started in peat pots or direct seeded in the permanent location. The procedures for starting seeds and transplanting perennials are the same as those used for annuals.

Ornamental Grasses

Ornamental grasses are excellent for use as **accents** and, therefore, make attractive edging. They are also good groundcovers. They have unique characteristics with their various colors, shapes, and textures of plumage. Also, ornamental grasses create a sense of movement in the landscape. As air circulates in the garden, the grasses wisp with movement to accent the garden. The leaves of ornamental grasses are excellent in dried arrangements as the foliage will vary from dark to variegated with seasonal changes in the plants. Most of these grasses prefer a hot, sunny, and well-drained location. Figure 26–3 lists some ornamental grasses and their characteristics.

Vines

Vines are important in today's landscape. Many types of vines are used to mask various landscape features and create a flowing effect throughout the garden. They are used to soften the appearance of walls, fences, porches, trellises, and pergolas. They are also very effective in small gardens to provide flowers and foliage where space is limited. Vines on a wall have a microclimatic effect. For example, the use of a deciduous vine on a wall creates a cooling effect in the summer, whereas in the winter it allows the wall to be exposed to the sun for a warming effect.

Vines climb in three different ways. English ivy forms small, rootlike holdfasts to a wall as a means of support. Sometimes these are modified tendrils with small circular discs at the tips. Other vines, such as clematis and grape, climb by winding tendrils or leaflike appendages that act as tendrils around the object on which they are growing. The third group, such as bittersweet and wisteria, climb by twining. It is obvious that one must know in advance how each vine climbs so that a proper means of support can be provided for those vines selected for use.

Figure 26–4 lists some typical vines and their characteristics.



| NAME | EXPOSURE | SPACING | HEIGHT | BEST USE | REMARKS |
|--|-----------|---------|---------|--------------------------|--|
| <i>Carex morrowii</i> ('Variegata') (sedge) | semishade | 9"–12" | 12"–15" | border, bank | Leaves narrow, white margin. |
| <i>Calamagrostis</i> | sun | 4' | 3'–5' | accent | Looks great with black-eyed Susan. |
| <i>Chasmanthium latifolium</i> (northern sea oats) | sun | 18"–24" | 3' | accent | Winter interest. |
| <i>Cortaderia</i> (pampas grass) | sun | 9'–12' | 6'–9' | specimen | Silvery flower stalks. |
| <i>Festuca glauca</i> (blue fescue) | sun | 4'–6" | 10"–12" | border, bank | Blue-gray foliage. |
| <i>Imperata</i> (Japanese blood grass) | sun/shade | 3'–4' | 1'–2' | massing | Reddish foliage. |
| <i>Leymus</i> (blue wild rye) | sun | 2'–3' | 2'–3' | massing | Silvery blue foliage. |
| <i>Miscanthus floridulus</i> (giant miscanthus) | sun | 9'–12' | 12'–15' | accent, screen windbreak | Effective fall and winter. |
| <i>Panicum virgatum</i> (switch grass) | sun | 2'–3' | 3'–4' | accent | Fall interest. Open panicles. |
| <i>Pennisetum</i> (dwarf fountain grass) | sun | 4' | 3'–8' | accent | Excellent fall color. |
| <i>Phalaris arundinacea picta</i> (ribbon grass) | sun | 12"–15" | 18" | accent | White, variegate leaves. Spread by rhizomes. |

FIGURE 26–3 Ornamental grasses.

| NAME | REMARKS |
|--|--|
| <i>Campsis radicans</i> (trumpet vine) | This vine has a rich-looking orange flower. It is a very fast grower and will cling to most surfaces. It will grow in most soils in full sun. |
| <i>Celastrus scandens</i> (American bittersweet) | Bittersweet is fast growing, with orange and red berries on the female plants. It is very effective in the fall and grows well in most soils in full sun. With such bright-colored berries it is excellent for holiday decorations. |
| <i>Clematis hybrida</i> (clematis) | Clematis is best known for its excellent flowers, but must be trained on some support trellis, fence, or even a porch post. It needs well-drained soil that is slightly alkaline. The flowers like a sunny location, whereas the roots prefer a cool, shaded location. There are many cultivars on the market featuring striking colors of pink, purple, and white, just to name a few. It is best to prune in late winter or very early spring. |
| <i>Parthenocissus tricuspidata</i> (Boston ivy) | This vine is a very rapid grower. The foliage opens red in the spring, then turns a rich green in the summer. It does very well on walls. |
| <i>Polygonum auberti</i> (silverlace vine) | A very rapid grower, with white flowers in the summer. It needs a well-drained soil in full sun or in shade. |
| <i>Wisteria sinensis</i> (wisteria) | This vine is the old-timer, with fragrant blue-violet pendulous racemes (looks like a bunch of grapes) in late May. It was introduced into this country in 1816, and it requires deep, moist, well-drained soil. |

FIGURE 26–4 Vines used in today's landscape.



Bamboo

Bamboo is being used more extensively now in landscaping, especially to create an oriental touch. Bamboo can range in height from 6 inches to 120 feet. Although it is not really winter hardy, when it is killed back by cold winter temperatures it will often sprout back from the root when spring comes.

Bamboo has a rhizome root system. In some cases, when the landscape area calls for contained bamboo, it may be necessary to confine the roots to a given area. This can be done by planting the bamboo in a container, thus keeping the plant from spreading into other parts of the landscape. Bamboo is very difficult to contain in the open soil. Metal inserted several feet into the soil will slow spread until the metal rusts out.

The following are types of bamboo used in the landscape industry.

- * *Arundinaria variegata*—The leaves of this variety are grasslike with variegated foliage. It grows to 18 inches high in full sun to semishade.
- * *Phyllostachys*—This variety grows tall, in a range of 30 to 70 feet, with feathering foliage. It needs full sun exposure and must be forced to grow in clumps.
- * *Arundinaria pygmaea* (pygmy bamboo)—This bamboo grows low with grassy green foliage. It needs full sun and spreads very rapidly by rhizomes. It should be contained to the designated area.

Prairie Gardening

Many of the plants used in prairie gardens are native annuals, biennials, and perennials. These plants offer a unique way of naturalizing a garden. Prairie plants are grown informally in a meadow environment where masses and drifts of plants add beauty to the landscape.

Prairie plants attract butterflies, songbirds, and other wildlife and in the right combination, for example, liatris and asters, provide compatible colors and texture variation in the landscape.

Some nurseries have special seed mixes that grow best in different areas of the United States. The garden should be planned to include plants that grow well under local soil and climatic conditions and that bloom over a long period of time. Tall-growing plants should be placed in the center or back of the bed and lower growers to the edges of the front.

Most prairie plants grow best in full sun and are very drought tolerant. They should, however, be watered during the first season after planting and during extreme dry periods.

Soil

As for most other plants, rich soils, high in organic matter, result in stronger, healthier plants. Some plants will grow in rather poor, dry soils but all do better in rich loam.

The soil should be prepared the same for planting annuals or perennials or for seeding a lawn.

The most economical way to plant is by seeding just as if seeding a lawn. Follow instructions on the seed packets as to depth and thickness to seed. Small seeds may need to be mixed in sand to space properly.

Plants can also be transplanted if a more immediate effect is desired.

Prairie gardens are maintained by hand pulling of weeds during summer and mowing in fall to remove old tops.

Annuals reseed themselves and perennials regrow from the roots to provide years of enjoyment with minimum effort. Additional seeding and planting or complete renovation may be necessary if undesirable weeds overwhelm the garden or desirable plants die out. Planting the proper mix of plants for the geographic area results in a more persistent garden.

Figure 26–5 lists prairie garden plants available for purchase and gives plant height, color, bloom time, moisture needs, best soil type, and light requirements. Use this list to plan your garden (Figures 26–6 and 26–7).



| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|-------------------------|--|--------|------------|------------|----------|-------|-----|
| Lavender Hyssop | <i>Agastache foeniculum</i> | 1'–3' | purple | Jul–Sep | D,M | S,L | ○● |
| Nodding Pink Onion | <i>Allium cernuum</i> | 1'–2' | white/pink | Jul–Aug | M,W | S,L | ○ |
| Leadplant | <i>Amorpha canescens</i> | 2'–3' | purple | Jun–Jul | D,M | S,L | ○ |
| Canada Anemone | <i>Anemone canadensis</i> | 1'–2' | white | May–Jun | M,W | S,L,C | ○● |
| Pasque Flower | <i>Anemone patens</i> | <1' | white | Apr–May | D | S | ○ |
| Virginia Anemone | <i>Anemone virginiana</i> | 2'–4' | white | Jun–Jul | M,W | S,L | ● |
| Angelica | <i>Angelica atropurpurea</i> | 5'–10' | white | June | W | S,L,C | ○● |
| Columbine | <i>Aquilegia canadensis</i> | 1'–3' | red-yellow | May–Jun | D,M | S,L | ○●● |
| Rock Sandwort | <i>Arenaria stricta</i> | <1' | white | June | D | S | ○ |
| Jack-in-the-Pulpit | <i>Arisaema triphyl-lum</i> | 1'–2' | green | Apr–May | M,W | S,L,C | ●● |
| White Woodland Milkweed | <i>Asclepias exaltata</i> | 4'–5' | white | Jul–Aug | D,M | S,L | ○●● |
| Red Milkweed | <i>Asclepias incarnata</i> | 3'–5' | pink-red | Jun–Jul | W | S,LC | ○ |
| Prairie Milkweed | <i>Asclepias sullivantii</i> | 3'–5' | pink | Jul–Aug | M | S,L,C | ○ |
| Common Milkweed | <i>Asclepias syriaca</i> | 2'–4' | lavender | Jun–Aug | D,M | S,L,C | ○ |
| Butterflyweed | <i>Aslepias tuberosa</i> | 2'–3' | orange | Jun–Aug | D | S,L | ○ |
| Butterflyweed for Clay | <i>Asclepias tuberosa</i> , var. <i>clay</i> | 2'–3' | orange | Jun–Aug | M | L,C | ○ |
| Sky Blue Aster | <i>Aster azureus</i> | 2'–3' | blue | Aug–Oct | D,M | S,L | ○● |
| Heath Aster | <i>Aster ericoides</i> | 1'–3' | white | Aug–Oct | D,M | S,L,C | ○ |
| Smooth Aster | <i>Aster laevis</i> | 2'–4' | blue | Aug–Oct | D,M | S,L | ○ |

| | | | | | |
|----------------------------------|----------------------------|--------------------------|----------------------------|------------|--|
| MOISTURE (Soil Moisture): | D=Dry M=Medium W=Wet | SOIL (Soil Type): | S=Sand L=Loam C=Clay | SUN | ○=Full Sun ●=Partial sun ●=Shade |
|----------------------------------|----------------------------|--------------------------|----------------------------|------------|--|

Courtesy of Prairie Nursery

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names.



| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|-------------------------------|-------------------------------|--------|------------------|------------|----------|-------|-----|
| New England Aster | <i>Aster novae-angliae</i> | 3'–6' | pink-purple-blue | Aug–Oct | M,W | S,L,C | ☉● |
| White Aster | <i>Aster ptarmicoides</i> | 1'–2' | white | Aug–Sep | D | S | ○ |
| Silky Aster | <i>Aster sericeus</i> | 1'–2' | purple | Sep–Oct | D | S | ○ |
| Canada Milk Vetch | <i>Astragalus canadensis</i> | 2'–3' | yellow | Jul–Aug | D,M | S,L | ○ |
| Blue False Indigo | <i>Baptisia australis</i> | 2'–5' | blue | Jun–Jul | M | S,L,C | ☉● |
| White False Indigo | <i>Baptisia leucantha</i> | 3'–5' | white | May–Jun | D,M | S,L,C | ○ |
| Cream False Indigo | <i>Baptisia leucoophaea</i> | 1'–2' | cream | May–Jun | D,M | S,L | ○ |
| Pale Indian Plantain | <i>Cacalia atriplicifolia</i> | 4'–8' | white | Jul–Sep | W | S,L | ☉● |
| Sweet Indian Plantain | <i>Cacalia suaveolens</i> | 3'–6' | white | Jul–Sep | M,W | S,L | ○ |
| Poppy Mallow | <i>Callirhoe triangulata</i> | 1'–2' | magenta | Jul–Aug | D | S | ○ |
| Marsh Marigold | <i>Caltha palustris</i> | 1'–2' | yellow | Jul–Aug | W | S,L | ☉● |
| Harebell | <i>Campanula rotundifolia</i> | 1'–2' | blue | Jun–Sep | D,M | S | ☉● |
| Partridge Pea | <i>Cassia fasciculata</i> | 1'–2' | yellow | Jun–Aug | D | S,L | ☉● |
| Wild Senna | <i>Cassia hebecarpa</i> | 4'–6' | yellow | Jul–Aug | M,W | S,L,C | ○ |
| New Jersey Tea | <i>Ceanothus americanus</i> | 2'–3' | white | Jul–Aug | D,M | S,L | ☉● |
| White Turtlehead | <i>Chelone glabra</i> | 2'–4' | white | Aug–Sep | W | S,L | ☉● |
| Lanceleaf Coreopsis | <i>Coreopsis lanceolata</i> | 1'–2' | yellow | Jun–Aug | D,M | S,L | ○ |
| Stiff Coreopsis | <i>Coreopsis palmata</i> | 2'–3' | yellow | Jun–Aug | D,M | S,L | ○ |
| Canada Tick-Trefoil | <i>Desmodium canadense</i> | 2'–5' | purple | Jul–Aug | M | S,L,C | ○ |
| Shootingstar | <i>Dodecatheon meadia</i> | 1'–2' | white-pink | May–Jun | M | S,L | ☉● |
| Narrow Leaf Purple Coneflower | <i>Echinacea angustifolia</i> | 1'–3' | purple | Jun–Jul | D,M | S,L | ○ |

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names. (*continued*)



| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|------------------------|----------------------------------|--------|--------------|------------|----------|-------|-----|
| Pale Purple Coneflower | <i>Echinacea pallida</i> | 2'–5' | purple | Jun–Jul | D,M | S,L,C | ○ |
| Purple Coneflower | <i>Echinacea purpurea</i> | 3'–4' | purple | Jul–Sep | D,M | S,L,C | ○● |
| Fireweed | <i>Epilobium angustifolium</i> | 2'–6' | pink | Jul–Aug | M,W | S,L | ○ |
| Rattlesnake Master | <i>Eryngium yuccifolium</i> | 3'–5' | white | Jun–Aug | D,M | S,L,C | ○ |
| Joe Pye Weed | <i>Eupatorium maculatum</i> | 4'–6' | pink | Jul–Aug | W | S,L,C | ○ |
| Boneset | <i>Eupatorium perfoliatum</i> | 3'–4' | white | Aug–Sep | M,W | S,L,C | ○ |
| Sweet Joe Pye Weed | <i>Eupatorium purpureum</i> | 3'–6' | purple | Jul–Aug | M | S,L,C | ○● |
| Flowering Spurge | <i>Euphorbia corollata</i> | 2'–4' | white | Jul–Aug | D | S,L | ○ |
| Queen of the Prairie | <i>Filipendula rubra</i> | 4'–5' | pink | Jun–Jul | M,W | S,L,C | ○ |
| Bottle Gentian | <i>Gentiana andrewsii</i> | 1'–2' | blue | Aug–Sep | W | S,L,C | ○● |
| Wild Geranium | <i>Geranium maculatum</i> | 1'–2' | lavender | Apr–Jul | M | S,L | ○●● |
| Prairie Smoke | <i>Geum triflorum</i> | 1' | red | Jul–Aug | D,M | S,L | ○ |
| Sawtooth Sunflower | <i>Helianthus grosseserratus</i> | 6'–12' | yellow | Aug–Sep | M,W | L,C | ○ |
| Showy Sunflower | <i>Helianthus laetiflorus</i> | 3'–5' | yellow | Aug–Sep | D,M | S,L,C | ○ |
| Downy Sunflower | <i>Helianthus mollis</i> | 4'–6' | yellow | Aug–Sep | D | S | ○ |
| Western Sunflower | <i>Helianthus occidentalis</i> | 2'–5' | yellow | Aug–Oct | D,M | S,L | ○● |
| Woodland Sunflower | <i>Helianthus strumosus</i> | 2'–5' | yellow | Aug–Oct | D,M | S,L | ○● |
| Ox Eye Sunflower | <i>Heliopsis helianthoides</i> | 2'–5' | yellow | Jun–Sep | M,W | S,L,C | ○● |
| Alum Root | <i>Heuchera richardsonii</i> | 2'–3' | green/orange | May–Jun | D,M | S,L | ○● |
| Wild Iris | <i>Iris shrevei</i> | 2'–3' | blue | May–Jun | W | S,L,C | ○● |
| Blue Flag Iris | <i>Iris versicolor</i> | 2'–3' | blue | Jun–Jul | W | S,L,C | ○● |

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names.



| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|-------------------------|---------------------------------|---------|-------------|------------|----------|-------|-----|
| False Boneset | <i>Kuhnia eupatorioides</i> | 1'–3' | white | Aug–Sep | D,M | S,L | ○ |
| Roundheaded Bush-clover | <i>Lespedeza capitata</i> | 2'–4' | white | Aug–Sep | D,M | S,L | ○ |
| Rough Blazingstar | <i>Liatris aspera</i> | 2'–3' | purple-pink | Aug–Sep | D,M | S,L | ○ |
| Meadow Blazingstar | <i>Liatris ligulistylus</i> | 3'–5' | purple | Aug–Sep | M | L | ○ |
| Dotted Blazingstar | <i>Liatris punctata</i> | 1'–2' | rose | Jul–Sep | D | S,L | ○ |
| Prairie Blazingstar | <i>Liatris pycnostachya</i> | 2'–4' | purple-pink | Jul–Aug | M,W | S,L,C | ○ |
| Dense Blazingstar | <i>Liatris spicata</i> | 3'–6' | pink-purple | Aug–Sep | M,W | S,L,C | ○ |
| Turks Cap Lily | <i>Lilium superbum</i> | 3'–5' | orange | Jul–Aug | W | S,L,C | ○● |
| Cardinal Flower | <i>Lobelia cardinalis</i> | 2'–5' | red | Jul–Sep | W | S,L | ○● |
| Great Blue Lobelia | <i>Lobelia siphilitica</i> | 1'–4' | blue | Jul–Sep | M,W | S,L,C | ○● |
| Lupine | <i>Lupinus perennis</i> | 1'–2' | blue | May–Jun | D | S | ○● |
| Bergamot | <i>Monarda fistulosa</i> | 2'–5' | lavender | Jul–Sep | D,M | S,L,C | ○● |
| Dotted Mint | <i>Monarda punctata</i> | 1'–2' | lavender | Jul–Sep | D | S | ○ |
| Evening Primrose | <i>Oenothera biennis</i> | 3'–6' | yellow | Jul–Aug | D,M | S,L | ○ |
| Wild Quinine | <i>Parthenium integrifolium</i> | 2'–5' | white | Jun–Sep | D,M | S,L,C | ○ |
| Smooth Penstemon | <i>Pentemon digitalis</i> | 2'–3' | white | Jun–Jul | M | S,L,C | ●● |
| Slender Penstemon | <i>Penstemon gracilis</i> | 1'–2' | lavender | May–Jun | D | S | ○● |
| Beardtongue | <i>Penstemon grandiflorus</i> | 2'–4' | lavender | May–Jun | D | S | ○ |
| Purple Prairie Clover | <i>Petalostemum purpureum</i> | 1'–3' | purple | Jul–Aug | D,M | S,L,C | ○ |
| False Dragonhead | <i>Physostegia virginiana</i> | 1'–2' | pink | Aug–Sep | M,W | S,L | ○ |
| Jacob's Ladder | <i>Polemonium reptans</i> | 1/2'–2' | blue | Apr–Jun | M | S,L | ●● |

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names. (continued)



| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|--------------------------|----------------------------------|--------|------------|------------|----------|-------|-----|
| Great Solomon's Seal | <i>Polygonatum canaliculatum</i> | 1'–4' | green | May–Jun | D,M | S,L,C | ○● |
| Prairie Buttercup | <i>Ranunculus rhomboideus</i> | 1/2' | yellow | Jul–Aug | D | S | ○ |
| Yellow Coneflower | <i>Ratibida pinnata</i> | 3'–6' | yellow | Jul–Sep | D,M,W | S,L,C | ○ |
| Meadow Rose | <i>Rosa blanda</i> | 3'–4' | pink-white | Jun–Jul | M | S,L,C | ○ |
| Pasture Rose | <i>Rosa carolina</i> | 1' | pink | Jun–Jul | D,M | S,L | ○ |
| Black-eyed Susan | <i>Rudbeckia hirta</i> | 1'–3' | yellow | Jul–Sep | D,M | S,L,C | ○● |
| Green Headed Coneflower | <i>Rudbeckia laciniata</i> | 3'–6' | yellow | Aug–Sep | W | S,L,C | ○● |
| Sweet Black-eyed Susan | <i>Rudbeckia subtomentosa</i> | 3'–6' | yellow | Aug–Oct | M,W | S,L,C | ○● |
| Branched Coneflower | <i>Rudbeckia triloba</i> | 2'–5' | yellow | Jul–Oct | M,W | S,L | ○ |
| Wild Petunia | <i>Ruellia humilis</i> | 1'–2' | violet | Jun–Aug | D,M | S,L | ○ |
| Royal Catchfly | <i>Silene regia</i> | 2'–4' | red | Jul–Aug | M | L | ○ |
| Rosinweed | <i>Silphium integrifolium</i> | 2'–6' | yellow | Jul–Sep | M,W | S,L,C | ○ |
| Compassplant | <i>Silphium laciniatum</i> | 3'–10' | yellow | Jun–Sep | D,M | S,L,C | ○ |
| Cupplant | <i>Silphium perfoliatum</i> | 3'–8' | yellow | Jul–Sep | M,W | S,L,C | ○● |
| Prairie Dock | <i>Silphium terebinthinaceum</i> | 3'–10' | yellow | Jul–Sep | M,W | S,L,C | ○ |
| Blue Eyed Grass | <i>Sisyrinchium campestre</i> | <1' | blue-white | Jun | D,M | S,L | ○● |
| Mountain Blue Eyed Grass | <i>Sisyrinchium montanum</i> | <1' | blue | Jun | M | L,C | ○ |
| Sweet-scented Goldenrod | <i>Solidago jejunifolia</i> | 1'–2' | yellow | Aug–Sep | D | S | ○ |
| Grey Goldenrod | <i>Solidago nemoralis</i> | 1'–2' | yellow | Aug–Oct | D | S,C | ○ |
| Ohio Goldenrod | <i>Solidago ohioensis</i> | 3' | yellow | Jul–Sep | M,W | S,L,C | ○ |
| Stiff Goldenrod | <i>Solidago rigida</i> | 2'–5' | yellow | Aug–Oct | D,M | S,L,C | ○ |
| Showy Goldenrod | <i>Solidago speciosa</i> | 1'–3' | yellow | Jul–Oct | D,M | S,L | ○ |
| Fame Flower | <i>Talinum rugospermum</i> | 1/2' | pink | Jun–Aug | D | S | ○ |

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names.

| NAME | BOTANICAL NAME | HEIGHT | COLOR | BLOOM TIME | MOISTURE | SOIL | SUN |
|-----------------------------|-----------------------------------|--------|-------------|------------|----------|-------|-----|
| Meadowrue | <i>Thalictrum dasycarpum</i> | 3'–6' | white | Jun–Jul | W | S,L,C | ☉● |
| Spiderwort | <i>Tradescantia ohiensis</i> | 2'–4' | blue | May–Jun | D,M | S,L | ☉● |
| White Ohio Spiderwort | <i>Tradescantia ohiensis alba</i> | 2'–4' | white | May–Jun | D,M | S,L | ☉● |
| Blue Vervain | <i>Verbena hastata</i> | 2'–5' | blue | Jul–Sep | M,W | S,L,C | ☉ |
| Hoary Vervain | <i>Verbena stricta</i> | 2'–4' | blue | Jun–Sep | D,M | S,L | ☉ |
| Ironweed | <i>Vernonia fasciculata</i> | 4'–6' | purple | Jul–Sep | W | S,L,C | ☉ |
| Culver's Root | <i>Veronicastrum virginicum</i> | 3'–6' | white | Jul–Aug | M,W | S,L,C | ☉● |
| Birdsfoot Violet | <i>Viola pedata</i> | <1' | blue-purple | Apr–Jun | D,M | S,L | ☉● |
| Heartleaf Golden Alexanders | <i>Zizia aptera</i> | 1'–2' | yellow | May–Jun | M | S,L | ☉ |
| Golden Alexanders | <i>Zizia aurea</i> | 1'–2' | yellow | May–Jun | M,W | S,L,C | ☉ |

FIGURE 26–5 Wildflower selection guide. Species are alphabetically listed according to their botanical names. (continued)

Courtesy of Prairie Nursery



FIGURE 26–6 Diane Ogg reviews her national winning prairie garden design with Carroll Shry at the National FFA Center, Indianapolis, Indiana.



FIGURE 26–7 A prairie garden in flower. This garden is planted with *Rudbeckia* (black-eyed susan) and *Echinacea* (purple coneflower).

SUMMARY

Perennials are plants that regrow every year. Hardy and herbaceous varieties are available. Flowering perennial garden plants will provide an array of color during all seasons. Other plants valued in the landscape are ornamental grasses, bamboo, and vines. Plants used in prairie gardens are native plants and lend an aura of interest for naturalists.

STUDENT ACTIVITIES


1. Draw a layout for a perennial flower bed to be planted on the school grounds or at home. If possible, plant the flower bed. Observe and record changes in the perennials as they enter the winter season.
2. Visit a local garden center that specializes in perennials.
3. Visit Longwood Gardens in Pennsylvania or White Flower Farm in Connecticut.
4. Have a guest speaker who produces perennials for resale.
5. Visit a nursery/landscape trade show.
6. Visit flower shows held in the early spring.
7. Search the Internet using the following terms: bamboo; perennial flowers; garden gate; prairie gardens; ornamental grasses.
8. Explore the Internet web site: <<http://www.prairienursery.com>>.

SELF-EVALUATION

MULTIPLE CHOICE

Select the best answer from the choices offered to complete the statement or answer the question.

1. A perennial is a plant that lives
 - a) from year to year without replanting.
 - b) for only 1 year.
 - c) for only 2 years.
 - d) all of these
2. Soil that is to be planted with perennials should be well prepared because
 - a) perennials are particular about soil conditions.
 - b) perennials grow in one location for many years.
 - c) all perennials require rich soil.
 - d) none of the above
3. Important considerations when selecting perennials for planting are
 - a) height and color.
 - b) time of bloom and color of flower.
 - c) soil fertility and drainage.
 - d) all of the above
4. The best way to select flowering perennials for a particular area is to
 - a) observe plants that are growing there.
 - b) judge according to what looks nicest in the seed catalog.
 - c) purchase plants with colors that blend well together.
 - d) all of the above

- 
5. Which of the following is not a part of soil preparation for flowering perennials?
- adding organic matter
 - providing proper drainage
 - adding mulch
 - adding fertilizer and digging it into the soil
6. When starting flowering perennials from seed, how long before the transplanting date should they be started?
- 2 to 3 months
 - 6 to 8 weeks
 - 1 to 2 weeks
 - 3 to 4 weeks
7. Plants are often seeded in peat pots. This is especially recommended for plants
- that are difficult to transplant.
 - that are to be sold.
 - that require good drainage.
 - that have tap root systems.
8. Time-release fertilizers should be used because
- nutrients are available throughout the growing season.
 - they are easy to apply.
 - they are readily available.
 - all of the above
9. Organic matter improves the soil cation exchange capacity by the addition of
- peat moss.
 - compost.
 - pine bark fines.
 - all of the above
10. Calamagrostis is a full-sun ornamental grass that looks great with
- bergenia.
 - asters.
 - black-eyed susan.
 - alyssum.
11. Ornamental grasses add an interest to the garden because of
- color.
 - texture.
 - movement.
 - all of the above
12. A herbaceous perennial is a plant that
- is evergreen.
 - dies back to the ground in the winter.
 - maintains a woody structure.
 - none of the above
13. Which of the following plants is not a vine?
- Campsis radicans*
 - Clematis hybrida*
 - Parthenocissus tricuspidata*
 - Calamagrostis* spp.
- 14) Bamboo has an aggressive root system of a
- fibrous root.
 - tap root.
 - contractile root.
 - rhizome.
15. A perennial bed should be mulched because it
- creates aesthetic enhancement.
 - helps to control weeds.
 - helps to keep the roots cool.
 - all of the above

SHORT ANSWER

Provide a brief answer for each of the following.

- List three perennials that have blue flowers.
- List three perennials that grow well in full sun.
- What color flowers does the astilbe produce?
- List three varieties each of ornamental grasses, vines, and bamboo used in the landscaping industry.