Herbaceous Ornamentals

chapter 10

In a nutshell...

- Ornamental plants add enjoyment and therapeutic benefits to our lives, but they require proper care to perform their best.
- Check the resources at **hort.extension.wisc.edu** for issues not covered in this chapter.

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Introduction

Herbaceous plants—annual, biennials, perennials, and bulbs—add color and interest to the landscape, complementing the structure that trees and shrubs provide. The leaves and stems of **herbaceous** plants die down to the ground at the end of the growing season—unlike woody plants, which have a persistent stem. Thousands of flowers and herbaceous plants are available to choose from, providing a diversity of plant form, texture, height, and color in mixed borders, shade gardens, wildflower gardens, or containers.

To successfully grow herbaceous ornamentals, consider your goals and the needs of the plants. This chapter will help you select and grow plants suitable for your conditions and tackle any maintenance issues that arise.

Learning objectives

1. Explain how flowers and other herbaceous plants can be used in a landscape.
2. Understand the difference between perennial and annual flowers and how each can be used in a landscape most effectively.
3. Know how to select appropriate perennials for your area.
4. Understand the maintenance necessary to keep annuals and perennials in good condition.
5. Describe some techniques for starting annual flowers indoors and the process of hardening off before setting outdoors.
6. Know some annuals that will perform well in your area.
7. Understand what a bulb is and the different botanical structures that are included in the common designation of "bulb."
8. Know some common types of spring and summer bulbs and how to select them.
9. Understand the storage requirements for common tender bulbs.
10. Describe how maintenance of bulbs differs from care of annuals or perennials.

Types of herbaceous plants

There are many things to consider when planning a flower garden. Not only do you have to decide which plants to include, you have to determine the best location for the garden and an appropriate style of garden.

Annuals complete their life cycle in one season and offer a gardener a chance to experiment with color, texture, form, and combinations.

They can be used in dedicated annual beds, to fill in gaps in a perennial bed, to fill spaces where spring-flowering bulbs have gone dormant, or in

containers for colorful accents. These plants generally bloom throughout the growing season, providing continuous color.

Perennials live for a few years to many years, providing relatively permanent plantings that don't need to be replanted every year (although perennials are not maintenance-free). Herbaceous perennials die back to the ground at the end of each growing season. Each type of perennial plant blooms at a specific time and for a limited length of time. Different types can be combined to create a garden with continuous, but changing, floral interest—or one that delivers a single-season blast of color.

Biennials usually require two growing seasons in order to complete their life cycle. They produce foliage and roots the first year, but do not bloom or produce fruit until the second year—something to consider when planning a landscape. After the second year, some biennials will die while others will self-sow, creating new plants for the following season. Some popular biennials are foxglove (*Digitalis*), hollyhocks (*Alcea*), sweet William (*Dianthus barbatus*), and Canterbury bells (*Campanula medium*).

Bulbs are specialized perennial plants that require different care than annuals and perennials. Spring-blooming bulbs are often the first flowers to provide color in our landscapes each year, while summer-blooming bulbs provide interest at other times.

Although herbaceous ornamentals are generally grown for their flowers, some have foliage and forms that will give your garden interest.

- The fineness or coarseness of the leaves give a plant its texture.
- Leaves come in many colors from yellow-green to silver gray to reddish-purple.
- Some plants have variegated foliage that will add interest when they are not in bloom.
- Many perennials have attractive fall color when cold weather approaches.

Once you have determined which plants are suitable for your site, consider your personal preference and design goals. For general information on designing a garden, see chapter 16, Landscape Design.

Annuals

Annual flowers provide an accent of color in the landscape throughout the growing season. You can find annuals in a wide variety of colors, heights, and textures in species that are adapted to full sun, partial sun, or shade, as well as cool- and warm-season plants. With such a variety of annuals to select from, they are useful for hanging baskets, containers, rock gardens, window boxes, mixed beds, and mass plantings. Annuals can also be used to attract butterflies and other wildlife, for their fragrance, or for cutting fresh or dried flowers. Many are also edible.

Annuals (sometimes called "bedding plants") complete their life cycle within one growing season. During that season, they germinate from seed, grow, flower, reproduce by setting seed, and die. Winter annuals germinate in the fall, overwinter as seedlings, flower in the spring, and then die in late spring as temperatures rise. In contrast, biennials take two seasons to complete their life cycle and perennials can live for many years. Hardy perennials and biennials are able to survive Wisconsin's winters, whereas most annuals freeze and die.

In some cases, annuals naturally reseed themselves, creating an ongoing patch of that plant. If the original plant was a hybrid, however, the seedlings may not be desirable because the recombination of genes often creates less attractive plants or flowers.

Annuals are sometimes classified by their hardiness: tender, half-hardy, and hardy.

- Tender annuals should not be planted outside until all risk of frost has passed, as they are usually damaged or killed by light frost.
- Half-hardy annuals can survive light frosts.
- Hardy annuals can endure heavy frosts and freezes and can be planted early in spring as soon as the soil can be worked.

For average dates of first and last frosts in Wisconsin, see chapter 9, General Gardening Practices.

Often, plants that are perennial in warmer climates are used as annuals in Wisconsin (see table 1). While most perennials do not bloom the first year from seed, those that do can be treated as annuals—enjoyed all summer and allowed to perish when winter's freezing temperatures arrive.

TABLE 1. Some perennials used as annuals in Wisconsin

Coleus	*Coleus* x hybrids
Feverfew	*Chrysanthemum parthenium*
Fountain grass	*Pennisetum* spp.
Fuchsia	*Fuchsia* spp.
Geranium	*Pelargonium* spp.
Heliotrope	*Heliotropium arborescens*
Impatiens	*Impatiens walleriana,* hybrids
Lantana	*Lantana camara*
Licorice plant	*Helichrysum peliolatum*
Moonflower	*Ipomoea alba*
Morning glory	*Ipomoea* spp.
Petunia	*Petunia* x *hybrida*
Sweet potato vine	*Ipomoea batatas*
Vinca	*Catharanthus roseus*

Advantages of annuals

Annuals are very versatile and can be used in a wide variety of ways. Most annuals are profuse bloomers. Plant breeders have produced large flowers in a rainbow of colors. Annuals can create a huge impact in a landscape design because they can provide instant color and, typically, bloom throughout the growing season—right up until frost.

Annuals can be conveniently purchased as transplants each spring, or easily and economically grown from seed started indoors or directly sown into the garden (see chapter 19, Plant Propagation). Because they grow only one season, gardeners can create a different color scheme in their gardens each year. Annuals can also be used as temporary ground covers or fillers until surrounding perennial plants mature.

Disadvantages of annuals

The downside of annuals is that, unlike perennials, they must be planted each year, which involves some expense and labor. Annuals also require higher levels of maintenance than most perennials, including more frequent watering and fertilizing. **Deadheading** (removing faded flowers and developing seeds) is often necessary to encourage continuous bloom and prevent the plant from setting seed and completing its lifecycle. If not properly maintained, annual plants may look unattractive by late summer.

Growing annuals

Annuals can be grown from seed or purchased as transplants.

Growing annuals from seed

Starting seeds indoors is an economical way to have transplants available to set outdoors once the threat of killing frosts has passed. Most gardeners begin receiving gardening catalogs in the mail in January each year, and these catalogs offer a vast array of annual flower seeds. Seeds also start showing up in local stores in January and February. The advantage to growing your own annual flowers from seed is that you have far more cultivars to choose from than you would if buying transplants from your local greenhouse. You can also grow plants less expensively this way.

By starting seeds indoors, you can have a blooming garden 4 to 6 weeks earlier than if you direct seed to the flowerbed. Growing quality transplants can be simple if you follow some basic cultural practices. For information on collecting, storing, and starting seeds indoors, see chapter 19, Plant Propagation.

Direct seeding outdoors

Direct seeding is beneficial for annuals that do not transplant well (e.g., poppies, nasturtiums, and morning glories). Similarly, direct seeding is preferable for annuals that grow quickly from seed (e.g., marigolds, zinnias, and cosmos). See chapter 9, General Gardening Practices for more details on direct seeding.

When seedlings are a few inches tall or have developed their first set of **true leaves**, thin the seedlings to the recommended spacing for the species.

Using transplants

Many types of annuals are available as small plants in spring. See Chapter 9, General Gardening Practices for more details on selecting and planting these transplants.

General maintenance of annuals

To be at their best, most annuals do best in soil that is high in organic matter and then need regular maintenance throughout the growing season. See chapter 9, General Gardening Practices for more information on selecting, planting, watering, mulching, fertilizing, and more.

Pest management

By and large most of the popular annuals don't have significant insect or disease problems, but that doesn't mean they are pest free. To help them stay healthy and avoid problems:

- If available, choose species and cultivars that are disease- and insect-resistant. Always inspect plants for signs of disease or insects before bringing them home and introducing them to your garden.
- Remove weeds, fallen leaves, spent flowers, and other debris from your garden that might encourage or harbor diseases and insects.
- Provide good air circulation and don't overwater or over-fertilize.
- Keep plants strong and able to resist pests by avoiding stresses, such as drought or nutrient deficiencies.
- Promptly remove any plants that become diseased or seriously infested with insects.

Most disease problems can be controlled culturally or by removing the diseased plant or plant parts. To determine the best method of control, first you need to identify the plant disease in question. For some diseases there is no cure; the plants must be removed. Apply fungicides to fungal diseases only when absolutely necessary. For more information on plant diseases, see chapter 6, Plant Pathology.

A variety of insects can feed on annuals. In many cases, the feeding is temporary and damage is minimal and does not affect flower production. However, for certain pests, damage can become so significant that management strategies should be considered. For more information on insects, see chapter 5, Entomology.

Annuals in containers

Containers of annuals add splashes of color to our landscapes. Containers include hanging baskets, window boxes, tabletop planters, large flowerpots, old boots, and other decorative containers. See chapter 9, General Gardening Practices, for more information on planting in containers.

Choose annuals for containers carefully. Plants should have similar cultural needs, including light, water, and fertility requirements. Then consider plant size, form, height, texture, and color. A variety of plant textures can create an attractive planting.

As a general rule, plant something taller and upright in the center or back of the container, something shorter (⅓ or ⅔ the height of the taller plant) in front, and include some trailing plants to cascade over the container edge (see table 2).

Containers can also be planted with just one **variety** of annual flower—such as a whole pot of geraniums or petunias. Group the containers together for a mixed look.

For a dramatic focal point, consider using unusual plants such as dwarf trees, tropical houseplants, or summer bulbs such as caladium in larger containers. Dwarf trees and tropical houseplants can be left in their individual container, set into the larger container, and then surrounded by annual flowers.

The size of the container will determine how many different plants you can include. Space annuals closely in the container if you'd like an immediate, full effect. For more information on designing and combining plants and colors, see chapter 16, Landscape Design.

TABLE 2. Upright and trailing annuals for containers

Upright annuals		Trailing annuals	
Amaranthus	*Amaranthus* spp.	Bacopa	*Sutera grandiflora, Sutera corda*
Coleus	*Coleus* x *hybridus*	Black-eyed Susan vine	*Thunbergia alata*
English daisy	*Bellis perennis*	Creeping Jenny	*Lysimachia nummularia* 'Aurea'
Hegiflora petunia	*Petunia* x *hybrida*	Ivy geranium	*Pelargonium peltatum*
Marigold	*Tagetes* spp.	Lobelia	*Lobelia erinus*
Ornamental grasses	Various genera	Petunia, trailing	*Petunia* spp.
Ornamental kale	*Brassica oleracea* var. *acephala*	Snapdragon, trailing	*Antirrhinum majus*
Pansy	*Viola* spp.	Sweet potato vine	*Ipomoea batatas*
Salvia	*Salvia spendens, Salvia farinacea*	Vinca vine	*Vinca major* 'Variegata'
Snapdragons	*Antirrhinum majus*		
Spike	*Dracaena* spp.		

Frost protection

Frost in Wisconsin can occur when many annuals are in full bloom. Frosts in the late spring—or at any time during the growing season—may threaten annuals. The first fall frost is often followed by several weeks of warm weather, so protecting tender plants at that time can extend the season of enjoyment.

When frost is expected, plants can be covered with a variety of materials to protect them. Place blankets, sheets, tarps, towels, cardboard, or other materials over plants to prevent frost from settling on the plants and causing damage. Plastic sheets, such as drop cloths, can also be used but do not offer as much protection where the plastic touches the plants. Be sure to anchor the covering if it is lightweight and there is a breeze. Coverings should be removed promptly in the morning to allow the plants to receive full light and prevent heat build-up. Containers can be moved into the garage or under an overhang next to the house to protect them from frost.

See chapter 9, General Gardening Practices for more information on extending the growing season.

Bringing annuals indoors

Some annuals can be brought indoors to enjoy into the winter. For example, wax begonias, coleus, and impatiens can tolerate lower indoor light levels and are easily dug, potted, and moved indoors. Isolate the plants from other indoor plants for several weeks to be sure diseases and insects did not come along for the ride. Often you can keep these plants going throughout the winter and take cuttings for new plants the following season.

To overwinter geraniums, remove the loose soil from the roots and hang the plants in a basement or other cool, dark place to remain dormant throughout winter. The plants can then be potted in early spring, watered, and placed in a bright, warm location where they will begin to grow. Once the plants are established, cut them back. When danger of frost is past, these geraniums can go outside into containers or flower gardens.

Growing annuals for special purposes

Annuals are multipurpose plants that can be used for more than just creating a showy splash of color in the garden.

Edible annuals

Flowers can add a whole new dimension to the table—and not just as a centerpiece. Many annual flowers are edible and tasty.

TABLE 3. Some edible annual flowers

Begonia	*Begonia* spp. and cvs.
Borage	*Borago officinalis*
Calendula	*Calendula officinalis*
Cornflower	*Centaurea cyanus*
Dianthus	*Dianthus* spp. and cvs.
Hyacinth bean	*Dolichos lablab*
Nasturtium	*Tropaeolum majus*
Ornamental kale	*Brassica oleracea*
Pansy/Johnny jump-up	*Viola* spp.
Safflower	*Carthamus tinctorius*
Scented geranium	*Pelargonium* spp.
Signet marigold	*Tagetes tenuifolia*
Sunflowers	*Helianthus annus*

For safety, be sure you have positively identified any flowers you eat. While many plants are used for garnish, all flowers placed on an individual or serving plate should be edible. Flowers to be eaten should never be treated with pesticides.

Flowers are usually very perishable, so harvest and care is important. Pick flowers in cool weather, after any dew has evaporated and as close to serving time as possible. Pick flowers that are fully open and not beginning to wilt. Place blooms between damp paper towels or in a loose plastic bag in the refrigerator until ready to serve. Before serving, gently rinse the flowers in cool water, inspecting for insects and dirt. While flowers are usually used fresh, they can also be dried and stored in airtight containers for later use.

A flower's taste can vary from year to year depending on soil and growing conditions. Different varieties of flowers will also have different flavors. It is a good idea to remove the **stamens** and **styles** from flowers (for more information see chapter 1, Botany) as the pollen can detract from the overall flavor. Additionally, some people will have allergic reactions to pollen.

Annuals for fragrance

Bright colors may be what you first think of when you think of annual flowers, but many are also wonderfully fragrant (see table 4).

TABLE 4. Some fragrant annuals

Annual carnations	*Dianthus* spp.
Basket flower	*Centaurea moschata*
Flowering tobacco	*Nicotiana alata*
Heliotrope	*Heliotropium arborescens*
Nasturtium	*Tropaeolum majus*
Petunia	*Petunia* spp.
Spider flower	*Cleome hassleriana*
Stock	*Matthiola* spp.
Sweet alyssum	*Lobularia maritima*
Sweet pea	*Lathyrus odoratus*
Verbena	*Verbena* x *hybrida*

Plant fragrant annuals where the scent can be enjoyed, such as in window boxes, near entryways, and alongside decks and patios. Containers planted with fragrant annuals should be placed where they are likely to be enjoyed. Often the fragrance is especially noticeable in mornings and evenings when breezes are light.

Annuals for cut flowers

While masses of annuals can be dramatic in the outdoor landscape, annuals can also be cut and brought indoors (see table 5). While you can cut flowers from your border, you can also grow a separate flower patch specifically for cutting.

TABLE 5. Some annuals for cut flowers

Amaranthus	*Amaranthus* spp.
Annual carnations	*Dianthus* spp.
Annual dahlia	*Dahlia* hybrids
Annual phlox	*Phlox drummondii*
Blanket flower	*Gaillardia pulchella*
Blue-eyed African daisy	*Arctotis stoechadifolia*
Bush violet	*Browallia* spp.
Calliopsis, coreopsis	*Coreopsis tinctoria*
Calendula	*Calendula officinalis*
China aster	*Callistephus chinensis*
Chrysanthemum	*Chrysanthemum* spp.
Clarkia	*Clarkia* hybrids
Cornflower	*Centaurea cyanus*
Cosmos	*Cosmos bipinnatus*
Flowering tobacco	*Nicotiana alata*
Larkspur	*Consolida ajacis*
Marigold	*Tagetes* spp.
Ornamental grasses	*Various genera*
Pansy	*Viola* spp.
Salvia	*Salvia* spp.
Snapdragon	*Antirrhinum* spp.
Stock	*Matthiola* spp.
Zinnia	*Zinnia* spp.

Prepare a bed for cut flowers the same as you would for a landscape planting.

- Using a raised bed will encourage good drainage and make the flowers easier to harvest because you won't have to bend over as far.
- Have a soil test done to determine pH and fertility and amend your soil as necessary. Sufficient potassium is essential for good cut flower quality. Excess nitrogen will cause soft, weak stems.
- Planting your cutting garden in rows may help with weeding and access to cut flowers. To encourage tall plants and long stems, space plants closer than you would in a landscape planting.
- A sub-irrigation system, such as a soaker hose, is best for watering cut flowers to reduce the potential for damage to flowers and foliage from water and fungal diseases.

Harvest flowers to be brought indoors in the early morning—when they are fully hydrated—after the morning dew has evaporated. Use a sharp cutting tool to make a clean cut. Keep cut flowers out of direct sunlight and submerge their stems in water immediately. Inspect flowers for insects before taking them indoors. Once inside, re-cutting the stems under water can encourage good water uptake. Place vases with cut flowers where you can enjoy them, preferably out of direct sunlight. Cooler temperatures will extend cut flower life.

Annuals for drying

Grow and harvest annuals to be dried (see table 6) in the same manner as growing for cut flowers. Most flowers to be dried are best harvested when they are somewhat immature, since flowers continue to open during drying. Flowers that are too mature when harvested and dried will likely shed petals and not last long once used in arrangements.

TABLE 6. Some annuals for drying

Annual baby's breath	*Gypsophila elegans*
Bells of Ireland	*Moluccella laevis*
Cockscomb	*Celosia* spp.
Cupid's dart	*Catananche caerulea*
Everlasting	*Helipterum* spp.
Globe amaranth	*Gomphrena globosa*
Love-in-a-mist	*Nigella damascena*
Money plant	*Lunaria annua*
Ornamental grasses	Various genera
Ornamental millet	*Pennisetum glaucum*
Statice	*Limonium sinuatum*
Strawflower	*Helichrysum bracteatum*
Sunflower	*Helianthus annus*

Once cut, bunch the flower stems together with rubber bands. Flowers can be dried in a variety of ways, but the most simple and common way is to air-dry them. To keep stems straight, hang bunches of cut flowers upside-down in a cool, dark location with good airflow. The most important factors in maintaining color in dried flowers are removing them from direct sunlight immediately after cutting and drying them in a dark place.

Drying time will depend on the type of flower you are drying, how hydrated the flowers were at harvest, and the humidity, temperature, and airflow of the place you use to dry them. Flowers are sufficiently dried when they feel stiff and dry, rather than limp and damp. Once dried, store or display your flowers out of direct sunlight and away from heat sources. They can be used in a variety of ways, including wreaths, swags, bouquets, and other arrangements.

Annuals that attract beneficial insects

Annual flowers can be used to attract beneficial insects to your yard and garden (see table 7). Some beneficial insects control insect pests. For example, hoverflies are very effective in controlling aphids. Parasitoid wasps and lacewings are other beneficial insects you may want to attract to your garden.

TABLE 7. Some annuals that attract beneficial insects

Anise hyssop	*Agastache foeniculum*
Asters	*Callistephus chinensis*
Cosmos	*Cosmos bipinnatus*
Daisy-type flowers	Various genera
Sunflowers (dwarf)	*Helianthus annus*
Sweet alyssum	*Lobularia maritima*
Zinnia	*Zinnia* spp.

Plant annual flowers that attract beneficial insects among vegetables or create ornamental borders around other plantings. Plant a variety of flowers with different heights—including tall upright plants and low, creeping ones—to provide habitat and food for different beneficial insects.

Beneficial insects can help you reduce or eliminate the use of pesticide sprays. NOTE: Most pesticides used to control pest insects will also kill beneficial insects. For information on attracting beneficial insects, see chapter 5, Entomology.

Annuals grown for foliage

Not all annuals are grown for their beautiful flowers: many have interesting, attractive, or colorful foliage that can stand alone or be used to set off other flowers (see table 8). They are especially helpful in adding texture to garden and container designs.

TABLE 8. Annuals grown mainly for foliage

Alternanthera	*Alternanthera dentata*
Amaranthus (some cultivars)	*Amaranthus* spp.
Asparagus or Sprengeri fern	Asparagus densiflorus
Coleus	*Coleus, Solenostemon*
Dusty miller	*Centaurea cineraria*
Iresine (bloodleaf)	*Iresine herbstii*
Ornamental kale	*Brassica oleracea*
Plectranthus	*Plectranthus* spp.
Polka dot plant	*Hypoestes*
Spike	*Dracaena* spp.
Sweet potato vine	*Ipomoea batatas*

Common annuals for Wisconsin

Some annuals have long been a mainstay in Wisconsin gardens; others are new varieties. Table 9 lists some of the most common annuals suitable for our growing zones.

Perennials

Herbaceous perennials are flowering plants that live more than two years. The top of the plant dies back to the ground every fall, but the roots, crown, or other storage structures survive the winter to produce new foliage and blooms year after year. Different perennials vary in the length of their life span. Peonies, irises, and daylilies may live for decades, while Shasta daisies, columbine, lupines, and delphinium often survive for only a couple of years.

Hardy perennials are those that can survive the winter in your hardiness zone (see chapter 9, General Gardening Practices, for more information about hardiness zones). Tender perennials may not survive, or survive only with winter protection. See table 10 for a listing of perennials that are hardy in Wisconsin.

Advantages of using perennials

The biggest advantage of planting perennials is that you don't need to replant them every year. Another advantage is that they offer a wide assortment of shapes, colors, and textures and provide your garden with changing interest throughout the year. Perennials may be used:

- In mixed flower borders, shade gardens, wildflower gardens, containers, for naturalizing the landscape, and as groundcovers.
- Individually or in various combinations.
- In tiny nooks or used in vast swaths.
- To create a stunning, single-season blast of color or continuous floral interest throughout the growing season.

TABLE 9. Common annuals for Wisconsin (listed alphabetically by scientific name) **Light key:** ◯ = sun; ◑ = partial sun; ● = shade

Plant	Characteristics
Ageratum, floss flower *Ageratum houstonianum* ◯	• Pink, blue, or white blossoms • 5–12″ • Good edging plant
Amaranthus, love-lies-bleeding *Amaranthus* spp. ◯	• Variety of heights, forms (trailing, upright), foliage colors available • Bright, striking blooms in pink, red, or green • Tolerates dry soil • Good dried flower • Useful as an annual hedge
Snapdragon *Antirrhinum majus* ◯◑	• Tall, short • Full range of colors • 6–48″ • Good cut flower • Cut back for repeat bloom • Frost hardy
Begonia *Begonia* x *semperflorens-cultorum* ◯◑	• Pink, red, or white blossoms • Green to red foliage • 6–12″
Flowering kale *Brassica oleracea* var. *acephala* ◯	• Colorful foliage in fall • Red and white varieties available • 12–18″ • Tolerates frost
Pot marigold *Calendula officinalis* ◯◑	• Orange, yellow, or cream blossoms • 12–24″ • Does not tolerate high temperatures • Good cut flower • Edible flowers
Annual aster, China aster *Callistephus chinensis* ◯◑	• Blue, pink, purple, red, or white blossoms • 6–24″ • Heavy feeder • Excellent cut flower
Canterbury bells *Campanula medium* ◯	• Blue, pink, white, or purple blossoms • 24–36″ • Most cultivars are biennial • Grows best in moist soil
Ornamental pepper *Capsicum annuum* ◯	• Many different fruit shapes • Green, red, black, orange, or yellow fruits • 6–24″ • Fruit is edible, fresh or dried
Vinca, periwinkle *Catharanthus roseus* ◯◑●	• Pink, red, or white blossoms • 3–18″ • Heat and drought tolerant

Plant	Characteristics
Celosia *Celosia argentea, C. plumosa, C. spicata* ◯	• Plumed, crested (cockscomb) • Available in neon bright colors • Fuchsia, red, orange, rose, or yellow blossoms • 6–30″, upright • Adaptable to most soils • Good for cut and dried flowers
Cornflower, bachelor's button *Centaurea moschata* ◯◑	• Blue, pink, purple, red, or white blossoms • 15–36″ • Tolerates poor, dry soil • Excellent cut or dried flower
Chrysanthemum, painted daisy *Chrysanthemum* spp. ◯	• Orange, purple, red, white or yellow blossoms • 18–24″ • Prefers rich soil and cool weather • Good cut flower
Spider flower *Cleome hassleriana* ◯	• Compact cultivars • (Sparkler hybrids) • Pink, purple, or white blossoms • Strong fragrance • 36–60″ • Self-seeds
Coleus *Coleus x hybridus, blumei (Solenostemon scutellarioides)* ◯◑	• Various types of foliage color and growth habit • Grown for colorful foliage • 8–24″ • Good houseplant
Larkspur, annual delphinium *Consolida ajacis* and other spp. ◑	• Blue, pink, purple, red, or white blossoms • 24–42″ • Plant parts are poisonous • Good cut flower
Cosmos *Cosmos* spp. ◯◑	• Available in pink, red, white, yellow, or orange blossoms • 12–48″ • May require staking • Grow in poor soil to encourage blooms • Tolerates hot, dry conditions
Sweet William *Dianthus barbatus* ◯	• Annual and biennial • Pink, red, or white blossoms • Fragrant • 6–24″ • Self-seeds

TABLE 9. Common annuals for Wisconsin, *continued*

Light key: ◯ = sun; ◑ = partial sun; ● = shade

Plant	Characteristics
Pink, carnation ◯ *Dianthus chinensis*	• Other species perennial • Pink, red, or white blossoms • Fragrant • 6–24″ • Best in well-drained alkaline soils • Deadhead to promote flowering
California poppy ◯ *Eschscholzia californica*	• Orange, pink, red, white, or yellow blossoms • 9–12″ • Tolerates dry, sandy sites • Does not transplant well
Fuchsia ◯◑ *Fuchsia spp.*	• Upright or trailing • Pink, purple, orange, red, or white blossoms • 12–48″ • Good pot or hanging basket plant
Blanket flower ◯ *Gaillardia pulchella*	• Red, yellow, and orange blossoms • Bicolor petals • Tolerates heat and drought
Gerbera daisy ◯ *Gerbera jamesonii*	• Orange, pink, purple, white, yellow, or red blossoms • 15–24″ • Good cut flower • Good container plant
Globe amaranth ◯ *Gomphrena globosa*	• Pink, purple, white, yellow, or red blossoms • 6–24″ • Excellent dried flower
Baby's breath ◯ *Gypsophila elegans*	• White or pink blossoms • 12–24″ • Excellent cut or dried flower
Sunflower ◯◑ *Helianthus annuus*	• Tall, seed-producing, multi-branching • Rust, white, yellow, or orange blossoms • Large height range, from 15–120″ • Seeds edible for people or wildlife • Can be grown as annual screen
Strawflower, everlasting ◯ *Helichrysum bracteatum*	• Orange, pink, red, white, or yellow blossoms • 12–36″ • Prefers sandy soil • Excellent dried flowers
Heliotrope ◯ *Heliotropium arborescens*	• Blue, purple, or white blossoms • Fragrant flowers • 12–72″ • Good container/basket plant
Candytuft ◯◑ *Iberis umbellata*	• Pink, purple, red, or white blossoms • 8–15″ • Deadhead to encourage rebloom
Impatiens ◯◑ *Impatiens walleriana, I. hawkeri*	• Single and double flowers • New Guinea impatiens tolerates more sun • Red, orange, yellow, white, pink, purple, coral, or bicolor blossoms • 8–24″ • Very frost sensitive • Benefits from early pinching; deadheading not necessary
Morning glory ◯ *Ipomoea* spp.	• Blue, pink, purple, red, or white blossoms • Each bloom lasts one day • Vine 8–10′ • Plant parts can be poisonous
Sweet pea ◯ *Lathyrus odoratus*	• Vining and bush types • Orange, pink, purple, red, white, or blue blossoms • Fragrant flowers • Large height range, from 8″–10′ • Prefers cool, moist weather • Good cut flower
Statice ◯ *Limonium sinuatum*	• Blue, pink, purple, white, or yellow blossoms • 12–24″ • Good cut and dried flower
Lobelia ◯◑● *Lobelia erinus*	• Trailing, upright, mounded • Blue, pink, red, or white blossoms • 4–10″ • Trailing forms are good for hanging baskets
Sweet alyssum ◯ *Lobularia maritima*	• Purple, white, or pink blossoms • 3–10″ • Fast blooming from seed • Trim after flowering to encourage new flowers
Four-o'clock ◯ *Mirabilis jalapa*	• Pink, purple, red, white, or yellow blossoms • Flowers open around 4 pm • 18–36″ • Overwinter root indoors
Flowering tobacco ◯◑ *Nicotiana alata*	• Green, pink, purple, red, white, or yellow blossoms • Many fragrant, especially at night • 12–48″ • Plant parts are poisonous
Poppies ◯ *Papaver nudicaule, P. somniferum*, other spp.	• Pink, purple, orange, red, or white blossoms • Direct sow in spring; does not transplant well • Many self-seed prolifically

TABLE 9. Common annuals for Wisconsin, *continued*

Light key: ◯ = sun; ◑ = partial sun; ● = shade

Plant	Characteristics
Geranium ◯ *Pelargonium* hybrids and species	• Seed, zonal, scented • White, pink, rose, salmon, red, burgundy, purple, or bicolor blossoms • 8–20″ • Some attract hummingbirds
Petunia ◯◑ *Petunia* hybrids	• Grandiflora—larger flowers, but not as many of them • Multiflora—more flowers than Grandiflora, but not as large • Milliflora—more flowers than Multiflora, but even smaller • Spreading—plants cover a lot of space or hang in baskets • Hedgiflora—igorous and spreading, creates garden hedges or small berms of 2–3′ • Burgundy, red, rose, pink, salmon, yellow, white, blue, violet, lavender, orchid, or bicolor blossoms • Available as single and double blooms • Fragrant • Attract hummingbirds • Best with early pinching and deadheading
Moss rose ◯ *Portulaca grandiflora*	• Orange, pink, purple, red, white, or yellow blossoms • 4–10″ • Grows well in sandy soil • Tolerates heat and drought
Primrose ◑● *Primula* spp.	• Blue, pink, red, white, or yellow blossoms • 3–12″ • Slow to flower • Requires cool, moist conditions • Good for containers or rock gardens
Castor bean ◯ *Ricinus communis*	• Grown for reddish-green foliage • Huge, palm-like leaves • 5–10′ • Seeds are poisonous
Black-eyed Susan, gloriosa daisy, rudbeckia ◯ *Rudbeckia hirta*	• Perennial black-eyed Susan is *R. fulgida* • Daisy-like orange, red, or yellow flowers with contrasting center • 24–30″
Blue salvia, mealy-cup sage ◯◑ *Salvia farinacea*	• Blue, purple, or white blossoms • 18–24″
Salvia, scarlet sage ◯ *Salvia splendens*	• Red, pink, purple, or white blossoms • Attracts hummingbirds • 10–30″
Dusty miller ◯ *Senecio cineraria*	• Grown for silver-gray foliage • 8–15″
Marigold ◯ *Tagetes erecta, T. patula, T. signata and hybrids, T. erecta*	• White, yellow, orange, rust, or bicolor blossoms • Attracts butterflies • 6–36″ • Easy and fast to grow from seed
Nasturtium ◯◑ *Tropaeolum majus*	• Mounded, trailing • Orange, pink, red, white, or yellow blossoms • Some are fragrant • 6–12″ • Best in poor soil • Tolerates drought • Does not transplant well
Verbena ◯◑ *Verbena x hybrida*	• Blue, pink, red, or white blossoms • Fragrant • 8–16″ • Tolerates heat • Spreading habit; good in baskets or rock gardens
Pansy ◯◑ *Viola wittrockiana*	• Faced, plain, bicolor • Black, blue, red, rose, violet, white, yellow, blotch, and clear blossoms • Cool season • Self seeds and may overwinter • Edible
Zinnia ◯ *Zinnia angustifolia, Z. elegans, Z. haageana, Z. linearis,*and hybrids	• Green, orange, pink, purple, red, white, or yellow blossoms • Many flower forms • 4–48″ • Grows fast from seed, does not transplant well • Excellent cut flower

TABLE 10. Hardy perennials for Wisconsin

Name	Bloom	Color	Height	Light/Wildlife
Achillea (yarrow)	June–July	Y	1–3′	○
Aconitum (monkshood)	Aug–Sept	B	3–4′	○◑
Alchemilla (lady's mantle)	June	Y	1′	○
Allium	May–July	Pu, Y, W	8″–3′	○
Althaea (hollyhock) biennial	July–Aug	R, Y, P, W	6–8′	○
Alyssum (basket of gold)	Apr–May	Y	8–10″	○
Anaphalis (pearly everlasting)	July–Sept	W	2′	○
Anchusa (bugloss)	June–Sept	B	3′	○
Anemone	June–Sept	W, P	2–2½′	○◑
Anthemis (golden Marguerite)	May–June	Y	10″–2′	○
Aquilegia (columbine)	May–June	Y, B, P, R	2′	○◑
Arabis (purple rock cress)	Apr–June	W	6–8″	○
Armeria (sea pink)	May–June	Pi	6″	○
Artemisia (wormwood)	foliage	gray	1–3′	○
Aruncus (goat's beard)	June–July	W	6′	○◑
Asarum (wild ginger)	May–June	R	6″	●
Asclepias (butterfly weed)	July–Aug	O, P	2′	○
Asperula (sweet woodruff)	Apr.–May	W	6″	◑
Aster (Michaelmas daisy)	June–Oct	Pi, L, R	2–4′	○
Astilbe	June–Sept	Pi, L, R	6″–4′	○◑
Aubrieta (rock cress)	Apr–June	L, P, R	4–6″	○◑
Baptisia (blue wild indigo)	June	B	4′	○◑
Belamcanda (blackberry lily)	July	O	3′	○
Bergenia	Apr–May	Pi	1′	○◑
Boltonia	Aug–Sept	W	4–5′	○
Brunnera (Siberan bugloss)	Apr–May	B	1½′	○◑
Campanula (bellflower)	June–Sept	B	8″–1½′	○◑
Centaurea (perennial coneflower)	June–Aug	R, Y, B	2–4′	○
Centranthus (red valerian)	July–Aug	R	3′	○◑
Cerastium (snow-in-summer)	June	W	6″	○
Chelone (turtlehead)	Aug–Sept	Pi	3′	○◑
Chrysanthemum	June–frost	W, P, L, R, Y	14″–3′	○
Cimicifuga (snakeroot)	July–Aug	W	6′	○◑
Clematis	June–Sept	W, R, P, B	vine/bush	○◑
Convallaria (lily-of-the-valley)	May–June	W	8″	◑
Coreopsis (tickseed)	June–frost	Y, P	6″–2′	○
Corydalis (fumewort)	May–Aug	Y	1′	◑
Delphinium (larkspur)	June–July	B, W, P, M	1½–6′	○◑
Dianthus	May–June	Pi, W, R	1–2′	○
Dicentra (bleeding heart)	Apr–Sept	Pi, W	10″–4′	◑
Dictamnus (gas plant)	June	W	2½′	○
Digitalis (foxglove)	June–Aug	Pi, Y, Pu	3′	◑

Wildlife key: = attracts butterflies; = attracts hummingbirds; = not preferred by deer

Color key: A = apricot; B = blue; L = lavender; O = orange; Pi = pink; Pu = purple; R = red; W = white; Y = yellow

Light key: ○ = sun; ◑ = partial sun; ● = shade

Note: Not all of the plants listed may be hardy in your zone; for more information, consult online resources and chapter 9, General Gardening Practices

TABLE 10. Hardy perennials for Wisconsin, *continued*

Name	Bloom	Color	Height	Light/Wildlife
Doronicum (leopard's bane)	Apr–May	Y	1½′	◯◑
Echinacea (purple coneflower)	July–Sept	Pi	3′	◯
Echinops (globe thistle)	July–Sept	B	4–5′	◯
Epimedium (bishop's hat)	May–June	R, Y	1′	◑
Erigeron (fleabane)	June–Sept	B	1½′	◯
Eryngium (sea holly)	July–Aug	B	2′	◯
Euphorbia (spurge)	Aug–frost	Y–green bracts	6″–1′	◯
Filipendula (meadowsweet)	June–July	Pi, W	15″–6′	◯
Gaillardia (blanket flower)	June–frost	R, Y	1–1½′	◯
Gentiana	July–Sept	B	1½′	◑
Geranium (cranesbill)	May–Sept	Pi, B, R	8–15″	◯
Geum (avens)	May–June	O	1′	◯
Gypsophila (baby's breath)	June–Aug	W, Pi	6″–3′	◯
Helenium (Helen's flower)	Aug–Oct	Y	3′	◯
Helianthemum (rock rose)	June–July	Pi	10″	◯
Helianthus (sunflower)	Aug–Sept	Y	6′	◯
Heliopsis (hardy zinnia)	June–Sept	Y	3½′	◯
Helleborus (hellebore)	Feb–May	W, Pi	1–1½′	◑
Hemerocallis (daylily)	May–Aug	Y, R, Pi, O	6″–4′	◯◑
Hesperis (sweet rocket)	June–Aug	L, Pu, W	3′	◯◑
Heuchera (coral bells)	May–July	Pi, R, G	1–1½′	◯◑
Hosta	May–frost	Pu, W	3″–4′	◯◑
Iberis (candytuft)	May–June	W	8″	◯◑
Iris (flag)	May–July	B, L, Pu, Pi, Y, W	9″–4′	◯
Kniphofia (red hot poker)	Aug–Sept	R, Y	3′	◯
Lamium (yellow dead-nettle)	May–June	Y	1′	◑
Lamium (dead-nettle)	Apr–Aug	Pi	8″–1′	◑
Lathyrus (perennial pea)	July–Sept	Pi	9′	◯
Liatris (gay feather)	July–Sept	L, Pu	1½–4′	◯
Ligularia	July–Oct	O, Y	3–6′	◑
Lilium (lily)	June–July	L, O, Pi, R, Y, W	2–7′	◯◑
Limonium (statice)	July–Sept	L, B	1½′	◯
Lobelia	July–Sept	R, B	3–4′	◯◑
Lupinus (lupine)	May–July	B, L, Pi, R, W, Y	3–5′	◯◑
Lychnis	June–July	R, Pi	1½–2½′	◯
Lysimachia (loosestrife)	June–Aug	W, Y	2½–3′	◑
Macleaya (plume poppy)	July–Aug	W	6–8′	◯◑
Mertensia (Virginia bluebells)	Apr–May	B	1½–2′	◑
Monarda (bee balm)	July–Aug	R, Pi, L, W	1–3′	◑
Myosotis (forget-me-not)	May–June	B, Pi	8″–2′	◑
Nepeta (catmint)	June–Aug	L	1½′	◯
Oenothera (sundrops)	June–Aug	Y	10″–1½′	◯

Wildlife key: = attracts butterflies; = attracts hummingbirds; = not preferred by deer

Color key: A = apricot; B = blue; L = lavender; O = orange; Pi = pink; Pu = purple; R = red; W = white; Y = yellow

Light key: ◯ = sun; ◑ = partial sun; ● = shade

Note: Not all of the plants listed may be hardy in your zone; for more information, consult online resources and chapter 9, General Gardening Practices

TABLE 10. Hardy perennials for Wisconsin, *continued*

Name	Bloom	Color	Height	Light/Wildlife
Pachysandra	Apr–May	W	8″	◑
Paeonia (peony)	May–June	R, Pi, W, L	1½–4′	○
Papaver (poppy)	May–June	R, Pi, W	3–4′	○
Penstemon (beardtongue)	June–Aug	R, B, Pi	1½–2′	○
Perovskia (Russian sage)	July–Aug	B	3′	○
Phlox	May–Aug	Pi, B, W	4″–3′	○◑
Physalis (Chinese lantern)	Sept	O	2′	○
Physostegia (obedient plant)	Aug–Oct	Pi	3′	◑
Platycodon (balloon flower)	July–Aug	B	2′	○
Polemonium (Jacob's ladder)	May–June	B	2½′	◑
Polygonatum (Solomon's seal)	May–June	W	2–3′	◑
Potentilla (cinquefoil)	May–frost	Y, A	3″	○
Primula (primrose)	Apr–June	every color	8″–2′	◑
Pulmonaria (lungwort)	Apr–May	B	1′	◑
Rheum (ornamental rhubarb)	June–July	R	6′	○
Rudbeckia (black-eyed Susan)	July–Sept	Y	2–3′	○
Ruta (rue)	July–Aug	Y	2′	○
Salvia (meadow sage)	June–Sept	B	1–3′	○
Sanguinaria (bloodroot)	Apr–May	W	6″	◑
Saponaria (soapwort)	May–June	Pi	4″	○
Scabiosa (pincushion flower)	June–Sept	B	1–1½′	○
Sedum (stonecrop)	June–Sept	R, Pi, Y	4″–3′	○
Sempervivum (hen and chicks)	June–Aug	Pi	1′	○
Solidago (goldenrod)	Aug–Sept	Y	2–3′	○
Stachys (lamb's ears)	foliage	gray	10″	○
Stokesia (stokes aster)	July–Aug	B	15″	○
Thalictrum (meadow rue)	May–June	Pi	3–5′	○
Thermopsis (false lupine)	June–July	Y	4–5′	○
Thymus (thyme)	June	Pi	2–3″	○
Tradescantia (spiderwort)	June–Aug	B, Pi, L	2′	○
Trillium (wakerobin)	Apr–May	W, R	1–1½′	◑
Trollium (globe flower)	May–June	Y, O	2–3′	◑
Tunica (tunic flower)	July–Aug	Pi	8″	○
Heliotropium (golden heliotrope)	July–Aug	W	4′	○
Verbascum (mullein)	June–Sept	W	3′	○
Veronica (speedwell)	June–Aug	B	6″–2′	○
Vinca (periwinkle)	Apr–May	B	8″	○
Viola (violet)	May–Sept	Pu, Y, W	3″–1′	◑
Yucca (desert candle)	July–Aug	W	4–6′	◑

Wildlife key: = attracts butterflies; = attracts hummingbirds; = not preferred by deer

Color key: A = apricot; B = blue; L = lavender; O = orange; Pi = pink; Pu = purple; R = red; W = white; Y = yellow

Light key: ○ = sun; ◑ = partial sun; ● = shade

Note: Not all of the plants listed may be hardy in your zone; for more information, consult online resources and chapter 9, General Gardening Practices

Disadvantages of using perennials

Perennials are not maintenance-free—all plants need some attention to thrive. Most perennials need to be divided every 3 to 5 years. Some perennials need to be cut back after they bloom to look their best, while others need to have old flowers removed to continue blooming. Perennials often:

- Must be divided or renovated periodically.
- Have shorter bloom times than annuals.
- Reseed and spread.
- Take several years to establish.
- Cost more initially.

Selecting perennials

Each cultivar has a specific time and length of blooming; knowing each plant's characteristics allows a grower to create a garden with continuous color. There are many online resources as well as books about perennials that include blooming schedules (which may vary according to weather conditions, placement, and management) to help in plant selection.

Perennials are often used in bare spaces in the landscape—instead of a shrub or tree—because they mature faster. Most perennials bloom the year after being planted and reach their mature size in only a few seasons. An old adage holds "The first year they sleep, the second they creep, and the third they leap." A perennial garden can be well established in a few years, while trees planted at the same time would still be relatively small.

Landscape designers as well as homeowners use perennials to soften and hide structures. Perennials can also be used in containers on the patio, deck, or entryway to enliven spaces where plants cannot be planted in the ground. They can be used as foundation plantings around buildings in place of shrubs or between shrubs. Taller perennials are used to screen sheds, compost bins, and unsightly views.

Using specific perennials may solve problem areas in the landscape. In a wet area, plants that like wet "feet," or roots, can be used to create a bog garden. Plant succulents and other plants that like dry soil in an outcropping of rocks and gravel to create a rock garden. Shaded areas under trees may be planted with spring ephemerals and shade-loving perennials, turning the area into a woodland garden.

Perennials are also used in gardens designed to attract birds, butterflies, and beneficial insects. Table 10 indicates which plants are attractive to hummingbirds and butterflies. Don't use any insecticide in or around gardens that are created for attracting butterflies and hummingbirds. See also chapter 5, Entomology.

Not all plants will grow equally well in your garden. To be successful with perennials, you need to consider:

- The conditions the plant needs in order to thrive, including light and moisture requirements.
- The characteristics of the plant, such as size and flower color, that you wish to use.
- How much effort you are willing to invest in your garden after planting.

Size and form

Perennial gardens generally are designed in layers, with tall plants at the back, medium height ones in the middle, and smaller ones up front. Of course there are exceptions to this general rule, such as focusing on an accent plant or when working with an island bed. Think about the ultimate size of a plant (both height and spread) when determining whether it is suitable to include in your garden.

Scale is important, too, with the size of your yard and garden influencing whether a plant is appropriate for your site. Even though a tall perennial may physically fit in your garden, a very large plant may be overwhelming in a small yard or enclosed space. Since tiny plants are best viewed at close range, they can get lost in a big bed.

Perennials are long-lived and must be given room and time to grow. Those that are planted small may not bloom until their second year; large container-grown plants should bloom the first year. Regardless of the size plant you place in the ground, consider what its mature size will be. For more information, see chapter 16, Landscape Design.

Growth habits

Not all plants grow and expand at the same rate. Some, such as peonies, slowly get bigger every year but don't spread very far from their original site. Other plants move through the garden by **runners** or other means and grow far beyond where you planted them originally. This may be acceptable or may create problems, depending on the type of garden you intend and the amount of maintenance you are inclined to do. Consider how aggressive the plant may become in your garden—and how this fits with your plans—*before* bringing it home. That profusely self-seeding *Corydalis lutea* may be attractive in the nursery, but you may not want seedlings of it in every corner of your yard.

Just because some plants "move" easily doesn't mean you should avoid them. For example, many types of *Oenothera*, or evening primroses, expand on underground runners great distances from the parent plant, but these are shallow-rooted and quite easy to pull up if they turn up in a space where you don't want them. And in some cases—for example, to solve an erosion problem on a slope—you may want a plant with a spreading growth habit.

Blooming period

Most perennials have a relatively brief bloom time—at least compared to annuals that bloom throughout the season. You can choose to focus your garden on a particular time of year and select plants that will bloom then for maximum impact, or you can utilize various plants to bloom in succession for a continuous display throughout the season. As one plant's blooms begin to fade, a neighboring plant could take over the flowering show. To do this successfully, you must choose perennials that contribute to a design over a long period of time. Not only are the flowers important, but consider the foliage, too, as the leaves will offer visual interest.

Placement in the bed

To be able to place individual plants to best effect in the garden, you need to know something about your chosen plants. The character of any plant comes from its leaf texture and color, flower color, and overall shape or size at maturity. Consider all these aspects before you begin to dig. See chapter 16, Landscape Design, for more information.

It is best to plant perennials in Wisconsin in the spring to allow them time to establish before they have to face weather extremes. There are, however, exceptions. For example, bearded irises are best planted as soon as possible after flowering. Oriental poppies need to be dormant to be moved, and peonies are best moved in September after their roots have been replenished. Many other plants, especially those that bloom in the spring, can be successfully divided in the fall if given enough time to root before the ground freezes.

Ease of care

Every garden needs to be maintained; how much time you devote to specific tasks depends on your personal interest, physical condition, and available time. For some people, the amount of maintenance required is irrelevant because they want to be working in the garden all the time. Others cannot or do not want to devote their lives to their yard and will want to choose plants that require less maintenance. However, no plant is maintenance-free.

Prior to planting, prepare the bed by removing existing vegetation and enriching the soil with organic matter and other amendments as needed, according to a soil test. Deep-rooted perennials benefit more than annuals from **double digging**, which improves the soil to a much deeper level than normal tilling or digging. See chapter 9, General Gardening Practices for more details on this process.

To create an "easy" garden, focus on varieties that do not require deadheading, rarely need dividing, and can tolerate some moisture stress.

General maintenance of perennials

Pest management

No garden is ever pest-free. Insects and diseases may attack plants, and weeds invade even the most carefully tended area. Wildlife pests, such as deer, groundhogs, rabbits, or voles, can also create havoc, even in urban areas.

Many disease problems can be prevented by proper spacing (to allow good air circulation), by proper watering at soil level to reduce wet leaves, or by selecting varieties with disease resistance. Handpicking large insects, if they are not numerous, biological controls, or pesticides can deter insects. See chapter 5, Entomology, and chapter 6, Plant Pathology, for more specific information on controlling insects and diseases.

Slugs are a common problem in perennial plantings and prefer moist conditions: nicely mulched, well-watered gardens offer just what they like. Deter slugs by:

- Eliminating hiding places, including coarse mulch.
- Handpicking them from the plants at night or in the early morning.
- Dusting the ground with wood ashes or diatomaceous earth (although these could have a deleterious effect on the soil if used in quantity).
- Trapping them: A simple trap can be created by sinking an empty tuna can or other shallow container up to its rim in the soil and partially filling it with beer (slugs will be attracted to the smell, fall in, and drown). You can also place boards or bricks in damp spots on the soil. The slugs that collect under these can be smashed or killed with hot water or salt. Commercial traps are also available.

Vertebrate pests can also be a challenge. Many perennials are irresistible to deer. To keep deer out of your garden, you may need high fencing, bird netting, or a commercial deer repellent that is sprayed on plants to make them distasteful. Selecting perennials that deer do not prefer is another alternative. See chapter 8, Wildlife for more on controlling deer, rodents, and other pest animals in the home garden.

Hand weeding and mulching can help you manage weeds, and competition from the perennials themselves can keep them in check. See chapter 7, Weeds for more specific information.

Bed renovation and division

Perennials left in the same place will eventually need to be divided due to being overgrown or overcrowded. Some perennials such as chrysanthemums and Siberian iris die in the center of their clump. In this case it is best to renovate the bed by digging up the entire plant, discarding the dead plant material, and then dividing the remainder of the plant material into new plants to replant.

Division of plants is easy and the results provide new plants for the garden. An important factor in dividing perennials is doing it at the right time of year. A general rule to follow is:

- Divide early blooming perennials in the fall.
- Divide late blooming perennials in the spring.

Some plants, such as primroses, dwarf and tall bearded irises, and painted daisies, should be divided right after they have bloomed.

You can propagate perennials by seed, stem cuttings, root division, crown division, or root cuttings. For more details see chapter 19, Plant Propagation.

For more information on keeping a perennial bed in good condition, see chapter 9, General Gardening Practices.

Bulbs

Flowering bulbs can add a splash of color to gardens in spring and throughout summer. They can be intermixed with annuals, perennials, and shrubs or planted in masses for a bold focus of color. There are many types of bulbs suitable for planting in Wisconsin.

Most common bulbs are easy to grow and can be relatively inexpensive. Most can be purchased in quantity and last many years. They can be easily dug and moved, if necessary, and often can be divided to produce more bulbs. Rock gardens, grassy areas, cutting gardens, and naturalized areas are just some places bulbs can be used to add color, texture, and interest. Bulbs can even be forced indoors to brighten up the late winter months.

Some bulbs are hardy (see table 11) and can survive the winter in the ground. In fact, most hardy bulbs need winter's cold treatment to flower the following year. Other bulbs are tender (see table 12) and must be dug up in fall and stored indoors until replanting in spring.

TABLE 11. Some hardy bulbs

Asiatic lily	*Lillium* Asiatic hybrids
Crocus	*Crocus chrysanthus*
Daffodils	*Narcissus* hybrids
Giant allium	*Allium giganteum*
Glory-of-the-snow	*Chionodoxa luciliae*
Grape hyacinth	*Muscari armeniacum*
Greek anemone	*Anemone blanda*
Hyacinth	*Hyacinthus* x *orientalis*
Iris	*Iris* hybrids
Oriental lily	*Lillium* Oriental hybrids
Purple allium	*Allium aflatunense*
Siberian squill	*Scilla siberica*
Striped squill	*Puschkinia scilloides* var. *libanotica*
Tiger lily	*Lillium lancifolium*
Tulips	*Tulipa* hybrids

Table 12. Some tender bulbs

Tuberous begonia	*Begonia x tuberhybrida*
Canna	*Canna x generalis*
Gladiolus	*Gladiolus* hybrids
Freesia	*Freesia x hybrida*
Calla lily	*Zantedeschia* spp.
Dahlia	*Dahlia* hybrids
Elephant's ear	*Colocasia esculenta*
Caladium	*Caladium x hortulanum*

What are bulbs?

Bulbs are underground storage structures that contain energy in the form of carbohydrates. This energy is used during the blooming process and to produce leaves. The leaves then perform photosynthesis and replenish the energy in the bulb before dying back.

When we use the term "bulb" we are often referring to several different structures.

- **True bulbs** are actually underground stems surrounded by modified leaves. True bulbs include tulips, daffodils, and lilies. The leaves are held together at the bottom of the bulb by a basal plate. The dormant bulb also contains a very small preformed flower, called a flower **primordium**, which will eventually mature and bloom. If a bulb does not store enough energy, or if environmental conditions are not right, the bulb may not bloom and is considered "blind."
- **Corms** are swollen, compressed stems with nodes, internodes, and lateral buds. Corms include crocus, gladiolus, and anemone. They are somewhat flattened, with a basal plate on the bottom and a bud or buds on the top from which flowering stems emerge. Each year, a new corm forms above the old one, and the old one shrivels as the food is used up. Clusters of small corms, called **cormels**, form around the base, which can be used to propagate more corms.
- **Tuberous roots** are modified roots that contain one or more eyes, which are buds from which flowering stems will grow. Tuberous roots, which have leathery skin and no basal plate, include begonias and dahlias.
- **Rhizomes** are thick, horizontally growing underground stems. They typically grow just below the soil surface and have no scales or basal plate. Plants with rhizomes, such as bearded iris, canna, and lily-of-the-valley, often spread easily and may need frequent dividing.

For illustrations of the above-mentioned structures, see chapter 19, Plant Propagation.

Selecting bulbs

When purchasing bulbs, bigger is usually better—the larger the bulb, the more food (carbohydrates) is available for blossoming. While larger bulbs usually produce more or larger flowers, keep in mind they will typically cost more as well. Smaller bulbs may be more economical, but they may not bloom as well the first year after planting.

Many bulbs are sold by circumference, measured in centimeters. Others are sold by weight. Compare both size and price when shopping for the best deal. Spring bulbs are usually available only in fall, while summer-flowering bulbs can be purchased and planted in spring.

Inspect the bulbs carefully before purchase. Avoid any bulbs that seem shriveled, as that may mean the bulbs have lost moisture due to poor storage. Also avoid bulbs with mold on them, which may also indicate poor quality, disease, or deterioration. Bulbs should feel firm when squeezed and appropriately heavy. Bulbs that feel lightweight for their size have probably lost a significant portion of stored energy and likely will not bloom.

Also look at the basal plate to be sure there is no damage. Damage to the basal plate causes poor root growth. Bulbs with large nicks or bruises should also be avoided.

Mail order or online specialty bulb catalogs often offer a much broader choice of varieties than can be purchased locally. Be sure to choose a reputable company. You can often buy bulbs in large quantities at a significant discount in price. If you don't need all the bulbs, consider joining up with other gardeners to split up the order.

Once you've purchased them, keep your bulbs in a cool, dry area, between 60 and 65˚F, with good air circulation. Don't store them in a refrigerator with apples or other fruit. Apples or damaged and overripe fruits produce ethylene gas, a natural plant hormone that speeds ripening and is detrimental to stored bulbs. Ethylene causes the flower bud in many bulbs—especially tulips—to abort. Tubers and rhizomes may sprout in storage if exposed to ethylene gas. Also, don't store them in a garage or other location where they will be exposed to exhaust fumes, which also contain ethylene gas.

Spring flowering bulbs held over winter and planted in spring will not flower that year. Some may produce foliage during the summer and bloom the next year, while others will simply not grow.

Bulb varieties

Choose your bulb varieties based on your soil and environmental conditions, the design goal for your garden, and the time at which they flower. Many bulbs are available in several varieties, so you can make choices based on height, color, flower shape, and fragrance.

Some bulb species with large numbers of cultivars may be grouped into classes or divisions with similar characteristics. Those with divisions include tulips, daffodils, dahlias, and tuberous begonias. For divisions, see table 13.

TABLE 13. Divisions of popular bulbs

Tulips	Daffodils	Dahlias	Tuberous begonias
Single early	Long-cupped	Single	Single
Double Early	Small-cupped	Anemone	Camellia-flowered
Triumph	Double	Collarette	Fimbriata or carnation-flowered
Darwin hybrids	Triandrus hybrids	Water-lily	Crispa marginata
Single late	Cyclamineus	Peony	Multiflora
Lily flowered	Jonquilla hybrids	Star	Pendula
Fringed	Tazetta hybrids	Cactus	Picotee or lace
Viridiflora	Poeticus hybrids	Semi-cactus	Rosiflora
Rembrandt	Bulbocodium	Decorative	Marmorata
Parrot	Species daffodils	Ball	
Double late	Split-corona	Mignon	
Kaufmanniana	Miscellaneous	Topmix	
Fosteriana	Miniature	Miniature	
Greigii		Pompon	
Species			

Tulips
Hybrid tulips can be classified based on bloom time and flower type. Although hybrid tulips are usually spectacular their first year after planting, many dwindle and completely disappear after two or three years. This is because, after blooming, most tulip bulbs split into a number of smaller "daughter bulbs," which often lack the energy to produce flowers the next year.

Some types, however, retain their primary bulbs for a number of years before splitting. These non-splitting tulips tend to perform like perennials. Darwin hybrid tulips are some of the best varieties for perennializing. They produce large, vibrantly colored flowers on strong stems, making them among the most weather resistant of all garden tulips. Fertilize them twice a year to improve their perennial nature. Species tulips—although often not as big and showy as the hybrids—tend to be perennial, too.

Daffodils
The American Daffodil Society groups daffodils based on flower form. The center part of a daffodil flower, called the trumpet or cup, may be a long tube or short disk. The perianth is the circle of petals around the cup, and it may vary in size, shape, or color.

Dahlias
The daisy-type flowers of dahlias are available in many sizes, shapes, and colors. The American Dahlia Society classifies dahlias based on flower form. Within each form class, flowers are classified based on size.

Tuberous begonias
Tuberous begonias are available in several divisions, and have separate male and female flowers on the same plant. Often, the male flowers are larger and showier than the female flowers.

Planting bulbs

Choosing a location
Most bulbs adapt to a wide range of soil conditions, as long as the site is well drained. Wet soils contribute to poor growth and rotting of bulbs. Bulbs also do best in soil rich in organic matter.

While a few bulbs, such as caladium and tuberous begonia, can tolerate shady locations, most bulbs need a minimum of six hours of sun each day. Without enough sun, bulbs are unable to store enough energy to produce a flower the next year. It's often possible to plant spring flowering bulbs under deciduous trees because the trees do not leaf out and produce heavy shade until after the bulbs have completed their energy storage.

Timing
Tender bulbs should be planted in spring after danger of frost has passed. Ideally, the soil temperature will have warmed to 65˚F to promote rapid root and plant development.

Hardy bulbs are planted in fall, typically around late September in northern Wisconsin, to mid-October in southern Wisconsin. While it is possible to plant some bulbs, such as tulips, right up until the ground freezes, it is better to plant them earlier so that some root growth can occur prior to winter. If the fall is warm, some newly planted bulbs may sprout leaves, but that will not harm the following spring's flowering.

Transplanting bulbs in your garden can be done any time the bulbs are dormant. Wait until all the leaves have died back in late spring before digging and replanting hardy bulbs.

Planting depth
After amending the soil with organic matter and fertilizer, plant the bulbs at the proper depth for the species you are planting. Hardy bulbs are planted deep to help them survive winter and to prevent heaving. As a general rule, hardy bulbs should be planted at a depth 2½ times their diameter. In sandy soils they can be planted slightly deeper, and in heavy soils, slightly shallower. Tools made specifically for bulb planting are available to make the job easier.

Tender bulbs are planted closer to the soil surface, with the top about 1 inch below the ground. In many cases, they can be started indoors in spring to give them a head start and then transplanted outside when the soil and air has warmed enough.

Larger bulbs should be placed right side up, meaning with the **basal plate** down. With species that have smaller bulbs, such as scilla and grape hyacinth, this isn't as important—they can just be tossed in the planting hole.

General maintenance

Bulbs need some ongoing care to ensure they remain a part of your landscape for years to come.

Fertilizing

Bulbs need adequate fertilizer to help replace their energy reserves each year. The following are general recommendations; a soil test (see chapter 2, Soils) will help determine your garden's needs.

- At planting time, work a high-phosphorous, slow-release fertilizer or bone meal into the soil at the label rate.
- Spring fertilization with a complete fertilizer can also be helpful. Rake it lightly into the soil surface, being careful not to disturb the bulbs.
- In fall, again use bone meal or a high phosphorous fertilizer raked into the soil.

Tender bulbs should be fertilized two to three times during the growing season with a complete fertilizer.

After blooming

Once hardy bulbs have bloomed, they must store energy for the next year's flowers. Do not let the flower stalk develop seeds, as that will take a significant amount of energy that is better stored in the bulb. Cut the flower stalk down to the first leaf once the bloom has faded.

Do not cut the leaves back until they are completely yellow. As long as they are green, they will be performing photosynthesis and sending energy to the bulb. It's important, during this time, that the leaves receive significant sunlight and adequate moisture. They shouldn't be braided or tied up—even though this might look neater.

Hardy bulbs benefit from the addition of 2 to 3 inches of mulch applied in late fall. This helps insulate the soil so that the bulbs don't freeze as solidly and helps prevent heaving of bulbs as the soil goes through freeze–thaw cycles. Once the ground thaws in the spring, rake back the mulch so that the bulbs can grow uninhibited.

Storing tender bulbs

Tender bulbs can be left outdoors until they begin to die back in fall. Often the first frost kills the top of the plant. Cut back the stems and dig the bulbs. Remove the loose soil and allow the bulbs to dry—or cure—slightly. Package them so the individual bulbs are not touching (separate with newspaper, peat moss, etc.) to prevent all the bulbs from rotting, if one goes bad. Then place them in a cool, slightly humid location over the winter. Temperatures of 40˚F are ideal.

The bulbs can be placed in damp peat moss or sand to prevent them from drying too much over the winter. Check the bulbs periodically. If they are beginning to shrivel, raise the humidity by covering them with a moistened piece of burlap or other material (paper or fabric) to prevent further drying out. If they are beginning to mold, they probably have too much moisture. Discard any mushy bulbs and spread the rest out in a dry, warmer location for a short period to allow them to dry out slightly, and then return them to cool storage for the rest of winter. For more on storing tender bulbs, see table 14.

TABLE 14. How to store some commonly grown tender bulbs

ELEPHANT'S EAR (ALOCASIA OR COLOCASIA)	
Both can be lifted before frost, potted, and treated as a houseplant for the winter. Feed lightly throughout winter and water often. Otherwise the tubers can be cleaned and stored in peat moss. Check monthly and cut away any soft spots that develop. Allow the remaining healthy portion to dry before re-storing in peat.	
BEGONIAS, TUBEROUS	
Dig before a hard frost (a light frost can be allowed to kill the tops). Let the tubers dry for 1 to 2 weeks, with 2 to 5 inches of the foliage still intact. Remove excess soil and foliage and store at 50˚F.	
CALADIUM	
Lift caladium plants before frost. Allow them to dry in a warm spot for about a week. Cut back the foliage after it turns yellow. Store at a warmer temperature than for most other tender bulbs, at 60˚F.	
CALLA	
Dry the rhizomes of calla lilies for 2 to 3 weeks in a warm location, shake off the soil, and remove the dried stem. Store at 45 to 55˚F.	
CANNA	
Allow frost to kill the tops, but don't subject cannas to a hard freeze, which will turn the stem to mush. Dry the roots for a day or two. Cleaned roots can be wrapped in newspaper (or layered in peat moss or other packing material if your storage conditions are dry) and stored in paper bags or cardboard boxes at 45 to 50˚F. Check periodically to be sure the roots do not dry out; increase the moisture level if necessary. Wait until spring to divide them by breaking them apart, making sure there are at least three eyes per division.	
DAHLIA	
Dig before a hard freeze, but their tops may be allowed to die back from a light frost. The tuberous roots bruise easily, so handle with care. Although some people prefer to divide the roots immediately after digging because the eyes (or buds) are easier to see in the fall, it is best to wait until spring to prevent spoilage in storage. Let them dry for several hours before placing in storage. Check monthly for dehydration and mist lightly, if necessary.	

Propagating bulbs

Some bulbs multiply each year and produce new bulbs that can be dug, divided, and replanted. Daffodils, snowdrops, and grape hyacinths are examples of multiplying bulbs. Other bulbs, including most tulips and hyacinths, simply replace the old bulb with a new one.

Lilies will form small **bulblets** on the stem and **bulbils** on the base of the old bulb. These can be removed and planted separately. Corms form small cormels at the base of the main corm. When the corms are dug, the cormels can be removed and planted the next year. For all of these propagules, in their first year of growth the leaf looks grass-like, so be careful not to weed them out. It will take about 2 years of growth for them to reach blooming size.

Tubers can be dug and cut into pieces to produce more plants. Make sure each piece has at least one or two eyes or buds. Rhizomes can also be divided and cut into pieces to form new plants, as long as each piece contains buds that can form a new plant. For more, see chapter 19, Plant Propagation.

Animal damage

Bulbs can be attractive meals for deer, rodents, and other wildlife. Tulips are especially attractive to deer and rabbits. Daffodils are usually left alone, as the bulbs are toxic. If planting bulbs in an area where wildlife is present, prepare to use repellents and barriers to protect them. Deterrents such as garlic sprays and motion detectors connected to sprinklers have varying degrees of efficacy.

Bulbs are also often dug up by squirrels or chewed on by field mice. Placing a wire-mesh "box" around the bulbs when you plant them can provide protection against such damage.

Forcing bulbs indoors

Hardy bulbs can be forced to bloom indoors in late winter. While most varieties will work, shorter varieties will stay more compact in pots. Crocus and tulips can be forced successfully, but their blooms don't usually last very long indoors. For longer blooms, choose daffodils, grape hyacinths, Dutch iris, scilla (squill), and hyacinths.

The diameter of the container you use can vary depending on how many bulbs you want to plant in it and where you'll have room to put it when it's in bloom. The container doesn't have to be very deep—3 to 4 inches deep is enough—but it should have a drainage hole in the bottom.

Fill the container with an appropriate soil mix to within a couple inches from the top. Specialty soils for bulbs are available, or you can use a commercial "soilless" mix. The mix should drain well and not hold excess water against the bulbs.

Place the bulbs upright and very close together—even touching—on the soil mix. Placing them close together will help them to hold their foliage upright. Tulip bulbs have a flat side, which is where the first leaf typically emerges. Place that flat side around the outside of the pot for a uniform, full look.

Once all the bulbs are in place in the container, fill soil mix between and over them. It's okay if the tips of tulip and daffodil bulbs are poking above the soil line. Water the bulbs well and keep them at room temperature for a couple of weeks to allow the roots to become active, which will result in better growth later on. After a couple weeks at room temperature, place the container in a cool location (34 to 46˚F) for the appropriate length of time.

Pots of bulbs can be stored in an extra refrigerator, an unheated but insulated room or building, root cellar, or cold frame as long as the site will not freeze. If you use a refrigerator, be sure to remove any fruit or damaged or aging produce, which may release ethylene gas and cause the bulbs to abort their flower buds. Be careful not to expose the containers to exhaust fumes (such as in a garage), which also contain ethylene.

During this chilling period, biochemical changes occur inside the bulbs that allow them to bloom when they warm up. Check the container periodically during winter to be sure the soil remains moist but not wet. Another option is to place the pots in a plastic bag to retain moisture. Once the cool treatment time has passed, bring your containers into your house to trigger them to start flowering.

Place the bulbs in bright indirect light and temperatures of 55 to 70˚F. Within a few weeks, leaves and flower stalks will shoot up. Keep the soil moderately moist. Blooms will last longer in cooler temperatures, so avoid very warm areas in your house. Prolong the bloom time by placing the container in a cooler room or refrigerator at night and then moving them to the warmer living area when you are there to enjoy them.

Once blooms have faded, you have a couple of options. Because indoor light is usually not bright enough to regenerate the bulbs for flowering, most people simply dispose of the bulbs. However, if you want to try to save the bulbs, you can keep the foliage growing just like any other houseplant. If you place the container in a bright, sunny window, some bulbs might get enough energy to form daughter bulbs before the foliage naturally dies back. You can then plant the bulbs outside when spring comes or store the bulbs in a cool, dry place and plant them in fall. You may not get flowers the first year, but many bulbs that last for several years—such as grape hyacinth and daffodils—should flower in subsequent years.

Conclusion

Gardeners may have opinions on the pros and cons of growing annuals and perennials. The bright splashes of color and simple maintenance of annuals must be balanced by the higher yearly cost and their ephemeral nature. The year-round interest perennials provide comes at the expense of ongoing maintenance and the effort needed to coordinate bloom time. But both the seasonal and the long-lived have a place in the garden—along with the turf, woodies, and edible plants you choose to grow.

The wide array of herbaceous ornamentals available offers gardeners a broad plant palette of color and form to choose from. The only limit to their use in the garden—from large landscapes to small containers—is the gardener's knowledge of how to properly select, care for, and maintain them.

Resources

Wisconsin Horticulture publications are available at hort.extension.wisc.edu.

FAQs

Should I cut my perennials down?
It's a personal preference. The more cleanup done in fall means less work in spring. Most perennials left over winter provide visual interest, and possibly, food for birds and animals. A few perennials survive better untouched and should not be cut back until spring.

Is it too late to plant my bulbs?
Most bulbs are planted in the fall to ensure spring bloom. It's possible to plant at other times if the bulbs aren't shriveled, but they are unlikely to bloom the following spring. For naturalizing types, things should sync after that (many tulips will never do well).

Should I deadhead?
Some plants will bloom more prolifically if deadheaded. Deadheading may prevent them from going to seed and causing unwanted plants. To have self-seeding plants come back the following year or fruit to form, don't remove the spent flowers.

Why aren't my perennials/bulbs flowering like they used to?
Many perennials benefit from division every 3 to 5 years. Dividing removes dead parts of the plant and may invigorate new, more prolific growth.

Herbaceous Ornamentals, practice exam questions

1. **Tender annuals**
   a. Are hardiness zone 3 and lower
   b. Complete their life cycle in 3 or more years
   c. Can endure heavy frosts and freezes
   d. Should not be planted outdoors until the risk of frost has passed
2. **A true bulb is**
   a. A thick, horizontally growing underground stem
   b. Modified roots that contain one or more "eyes"
   c. An underground stem surrounded by modified leaves
   d. A swollen, compressed stem with nodes, internodes, and lateral leaves
3. **Annuals used to attract beneficial insects would include:**
   a. Ornamental grasses
   b. Zinnias and sweet alyssum flowers
   c. Ornamental kale and dusty miller
   d. All of the above
4. **When installing annuals**
   a. It is best to plant on bright, sunny days
   b. Plants that are in full flower transplant as readily as those not
   c. Tender transplants must be protected from wind
   d. Spindly, leggy plants can be planted deeper than usual
5. **The term "annual" refers to**
   a. A plant which completes its life cycle in one growing season
   b. Types of plants typically sold as "bedding plants" for northern gardens
   c. Technically does not include biennial plants
   d. All of the above
6. **An example of a plant with a perennial life cycle but typically grown as an annual in Wisconsin includes:**
   a. *Pelargonium* spp.
   b. *Geranium* spp.
   c. *Tagetes* spp.
   d. *Zinnia* spp.
7. **Which is an example of a deer resistant perennial?**
   a. *Hemerocallis* (daylily)
   b. *Helianthus* (sunflower)
   c. *Lamium* (dead nettle)
   d. *Potentilla* (cinquefoil)
8. **A canna "bulb" is actually a:**
   a. True bulb
   b. Corm
   c. Rhizome
   d. Tuberous root
9. ***Rudbeckia hirta* (Black-Eyed Susan) is best divided:**
   a. In the spring
   b. In the fall
   c. Shortly after bloom
   d. Never
10. **When mulching perennials**
    a. Coarse wood chips are preferred
    b. Crowns of the plants should be buried with compost
    c. Do not cover the crowns of the plants with mulch
    d. It is best done in early spring before the ground thaws
11. **Which is FALSE regarding perennials?**
    a. Perennials may take several years to establish
    b. Perennials may need to be divided to maintain vigor
    c. Perennials produce flowers all season
    d. Perennials are not maintenance free
12. **Pest control with herbaceous ornamentals**
    a. Is best done when the plants are flowering
    b. Should be avoided when plants are small
    c. Should be done within an IPM decision-making framework
    d. Should only use organic pesticides

Answer key
1. (d) 2. (c) 3. (b) 4. (c) 5. (d) 6. (a) 7. (c) 8. (c) 9. (a) 10. (c) 11. (c) 12. (c)