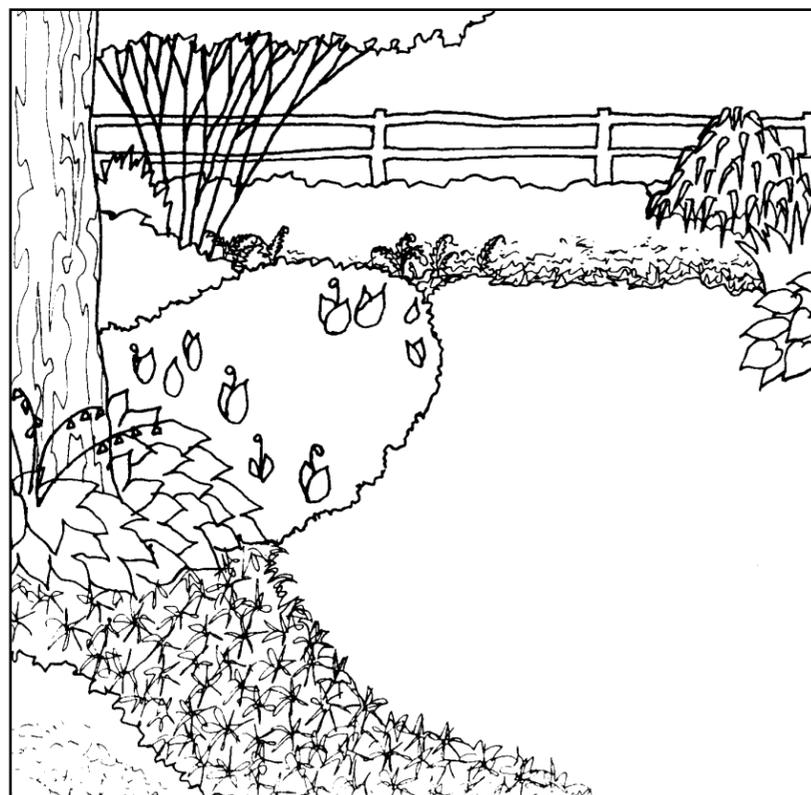


Growing Perennials

History of Perennials in the Landscape

Perennials have long been popular with gardeners throughout the world because they are relatively easy to grow and offer diversity of color, form and bloom sequence. A border bed of only perennials was first suggested in 1890 by George Nicholson, curator of the Royal Botanic Gardens at Kew, England. A movement began away from regimented rows of bedding plants in the flower beds of the mid-Victorian period (1870s) that continued into the 1900s. Tender bedding plants returned to favor in the early 1900s, and use of perennials decreased, while annuals in massed beds for summer show attracted the public. The return to the use of perennials started about 1914 and continues today.



Anne M. Hanchek, Assistant professor, Dept. of Horticultural Science, University of Minnesota
 J. Lee Taylor, Professor emeritus
 Pamela Allenstein, Former student, and
 Arthur C. Cameron, Associate professor, Department of Horticulture, Michigan State University



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The 19th century British plant experts William Robinson and Gertrude Jekyll played prominent roles in popularizing the perennial border and developing guidelines for its design. They grouped border perennials together and tiered them with the tallest plants (such as delphiniums) in the back and lower growing plants in the front to separate the border from the lawn. The border was set against the backdrop of a hedge, usually yew or boxwood, or a weathered brick wall. Careful selection and placement combined harmonious color schemes and contrasting forms to provide interest and a sequence of continuous bloom.

Perennial borders in this form, however, presented certain disadvantages. They required a great deal of space and attention and could be viewed from only one side. The background hedge competed for light and slowed air circulation, encouraging the back row to lean forward unless staked. These faults inspired the island bed concept at Bressingham Gardens in Norfolk, England, in the 1950s.

When planted in relatively narrow islands, the flowers could be viewed from all directions and shading by hedges or walls was eliminated. Taller specimens were placed in the middle of the bed, their height usually no more than half the width of the bed.

Today, limited space often makes it impossible or undesirable to devote an area entirely to growing only one type of plant, such as perennials. The trend is toward mixed borders or beds that include trees, shrubs, perennials, bulbs, annuals and biennials. This allows you to select plants that go well together to create year-round color and interest.

There is also a movement toward less formal, low-maintenance gardens. Perennials may be planted directly in lawns or in ground covers, such as periwinkle or English ivy—a practice known as “naturalizing.” Perennials having a low, spreading habit may also be used instead of more traditional ground covers. Dried flowers and leaves are left on the plants for winter interest and for use in dried arrangements. More ornamental grasses are used, as well as massings of one or a limited number of other perennials. By combining many species, you can create a spectacular display.

What are Perennials?

The term “perennials” commonly means “hardy herbaceous ornamental plants.” Hardy perennials are, with some exceptions, non-woody plants having roots that live through the winter while the tops die back to the ground, particularly in northern climates.

This distinction separates hardy perennials from tender perennials and annuals, which flower, set seed and die in the autumn frosts; and also from biennials, which take two years to complete the life cycle. In the first year biennials form low rosettes of leaves; the next year, they send up flowering stems and die. Many biennials seem to be perennial simply because they reseed themselves easily.

Some perennials will last almost indefinitely. Others tend to be short-lived and many last only a few years. Peony, daylily and iris are extremely long-lived, while columbine, shasta daisy and lupine tend to be short-lived, flowering for two or three years. When selecting plants, remember that “perennial” doesn’t necessarily mean “perpetual.”

The maintenance required for perennials also varies with the species. For example, chrysanthemum and delphinium need attention each year, whereas hosta, peony and balloon flower generally require little care after they are established. A relatively low-maintenance garden is possible, but it requires careful selection of plants well suited to the climate and planted in an appropriate location.

The following perennials will be excluded from this bulletin. Trees and shrubs, although they are perennials, have woody plant parts that normally do not die back to the ground each winter. Bulbs, tubers and corms have specialized methods of food storage and are usually treated separately, as are ferns and the less common wildflowers.

Perennials are usually sold under their botanical names (genus, species, cultivar) by the more reputable nurseries. This is because common names can be confusing: one plant may have three different common names, or one common name may refer to three different plants. However, every plant has only one unique botanical name. Occasionally, these names are changed by plant scientists to better describe the plant. When that happens, the old name becomes a synonym for the new.

Example

Common name:
Garden mum

Botanical name:
Dendranthema grandiflora

Synonym:
Chrysanthemum X morifolium

Cultivars:
‘MinnGopher’
‘Snowsota’
‘Mellow Moon’

Most modern reference books on perennials refer to the plants by botanical name, so learning to use these specific names can help you find information more quickly and accurately.

Why use Perennials?

Caring for perennials can be a type of creative expression. Perennials offer a wide variety of forms, colors, textures and sizes. They are long-lived, compared with annuals, and can require relatively low maintenance. They can also provide vigorous new stock for transplanting and trading with neighbors and friends.

Perennials are versatile. From the thousands of species and varieties available, you can select perennials that will thrive in any type of site, from wet to dry, fertile to infertile, sun to deep shade. They often provide the solution for problem areas, such as steep slopes, hillsides and rocky outcroppings. Notable examples of perennials that will thrive in these special

conditions are listed on the right.

A carefully planned perennial garden provides continuous flowering from early spring through late fall. Ornamental grasses and other plants with persistent flowers have winter interest, too. Combine perennials with annuals, ground covers, shrubs and trees to create a spectacular landscape that is continually changing in texture, form and color.

Problem Area Beautification Guide

Wet Areas

Iris sibirica
Monarda didyma
Viola odorata

Dry Areas

Achillea
Asclepias tuberosa
Hemerocallis

Low Plants

Artemisia
`Silver Mound'
Dianthus

Fertile Soil

Astilbe
Delphinium
Dendranthema grandiflora

Infertile Soil

Asclepias tuberosa
Baptisia australis
Gypsophila paniculata

Shade

Astilbe
Heuchera sanguinea
Hosta

Rocky Areas

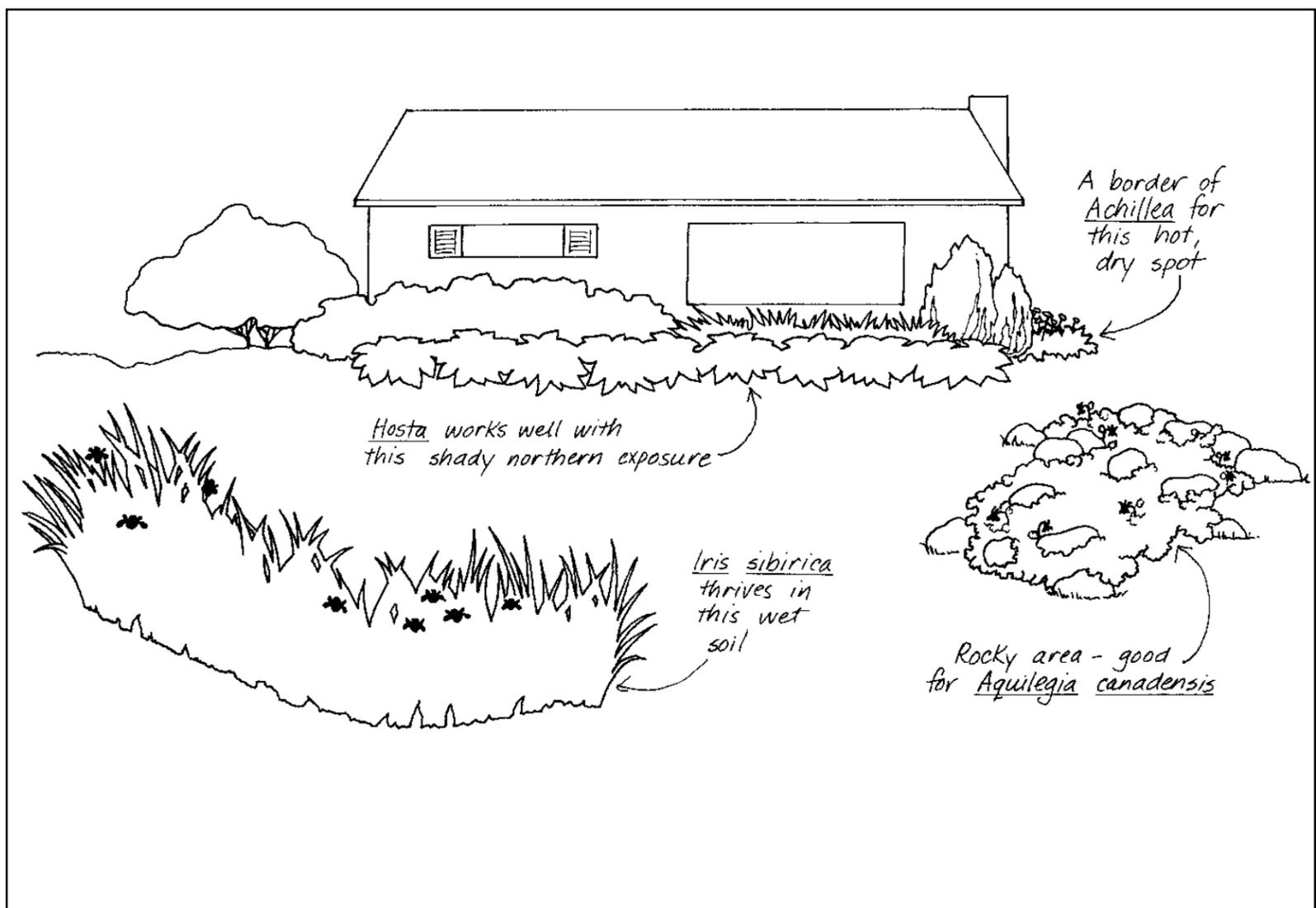
Aquilegia
Armeria maritima
Aurinia saxatilis

For Naturalizing

Ajuga
Helianthus helianthoides
Tradescantia X andersoniana

Tall Plants

Eupatorium maculatum
Phlox subulata
Calamagrostis acutiflora
Hibiscus moscheutos



DESIGNING WITH PERENNIALS

Why design at all? Designing a perennial flower garden and seeing it develop before your eyes can be rewarding. It takes time, knowledge and experience to prepare a good plan. The planning stage is too often overlooked by the impatient gardener, and this results in a haphazard collection of plant materials. The eye needs a sense of order. Too many variations in sizes, shapes, colors and textures create confusion. Remember that the most spectacular gardens all begin with a carefully thought-out design that has strong lines and structure.

Step #1: Determine the point(s) of viewing.

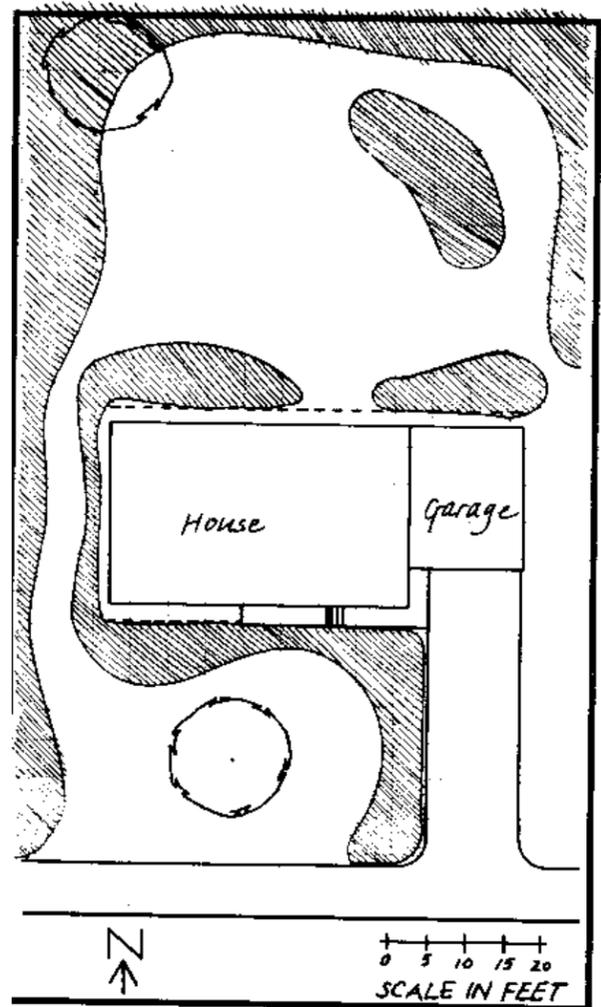
Place beds or borders where they can be readily seen and admired. Try to locate them in areas of high visibility, such as the front yard, near windows, the porch or patio, while keeping in mind other factors such as soil type, drainage, pH and light. Also consider that certain trees, such as black walnut and butternut, produce a chemical in their roots that is toxic to many plants, including peonies. Locate susceptible plants a minimum distance of 60 feet from such trees. Perennials with shallow root systems are less likely to be affected. Some trees, such

as red maples, have a shallow root system and will compete with perennials for moisture.

Step #2: Consider existing conditions.

Use the grid sheet on page 8 to sketch the layout of your yard, or create your own grid using 1/4-inch graph paper and a scale of 1/4 inch = 1 foot. If the scale is insufficient, use 1/4 inch = 2 feet. With a tape measure, determine the size of the area you wish to plant. Carefully record the location of existing plants that you want to keep and other permanent or temporary fixtures, such as a compost pile, posts, a water spigot, trash barrels, septic tanks and drain field. Indicate any

INFORMAL DESIGN



Five Steps in Designing a Perennial Garden

Step #1— Determine the point(s) of viewing.

Step #2— Consider existing conditions.

Step #3— Decide on style— either informal or formal.

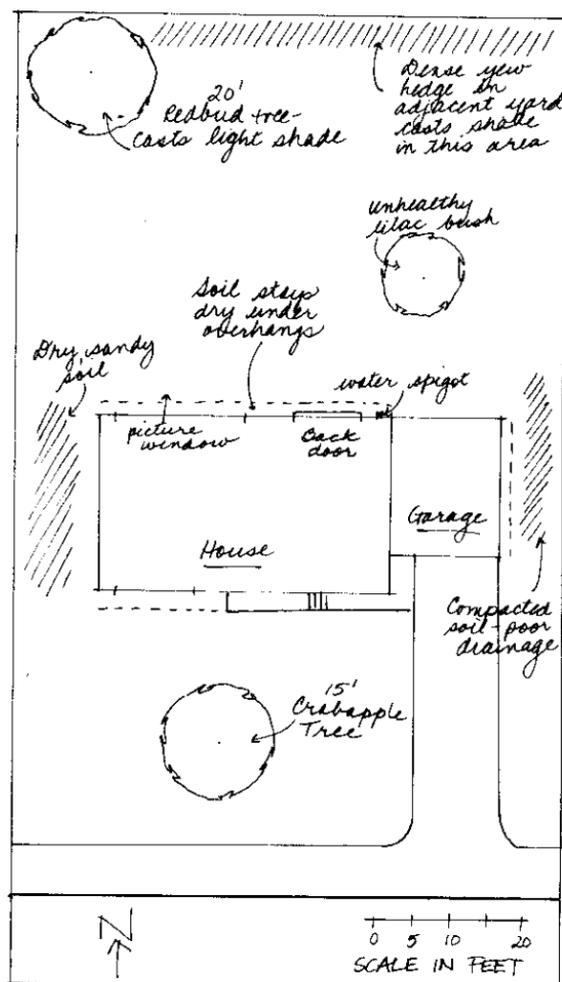
Step #4— Choose type of display.

Step #5— Select plants.

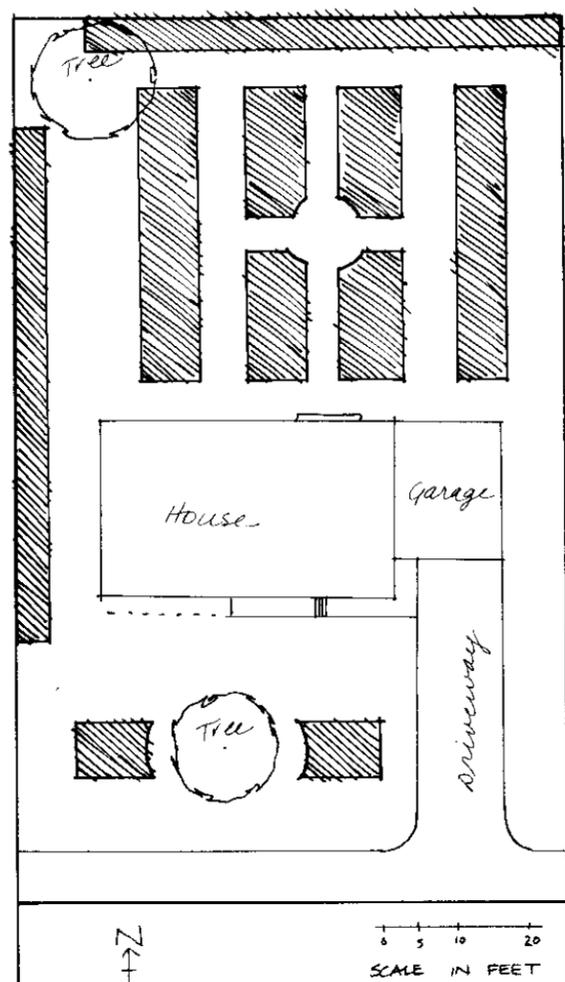
USING A GRID:

Sketch the layout of your yard, recording all existing features and plants.

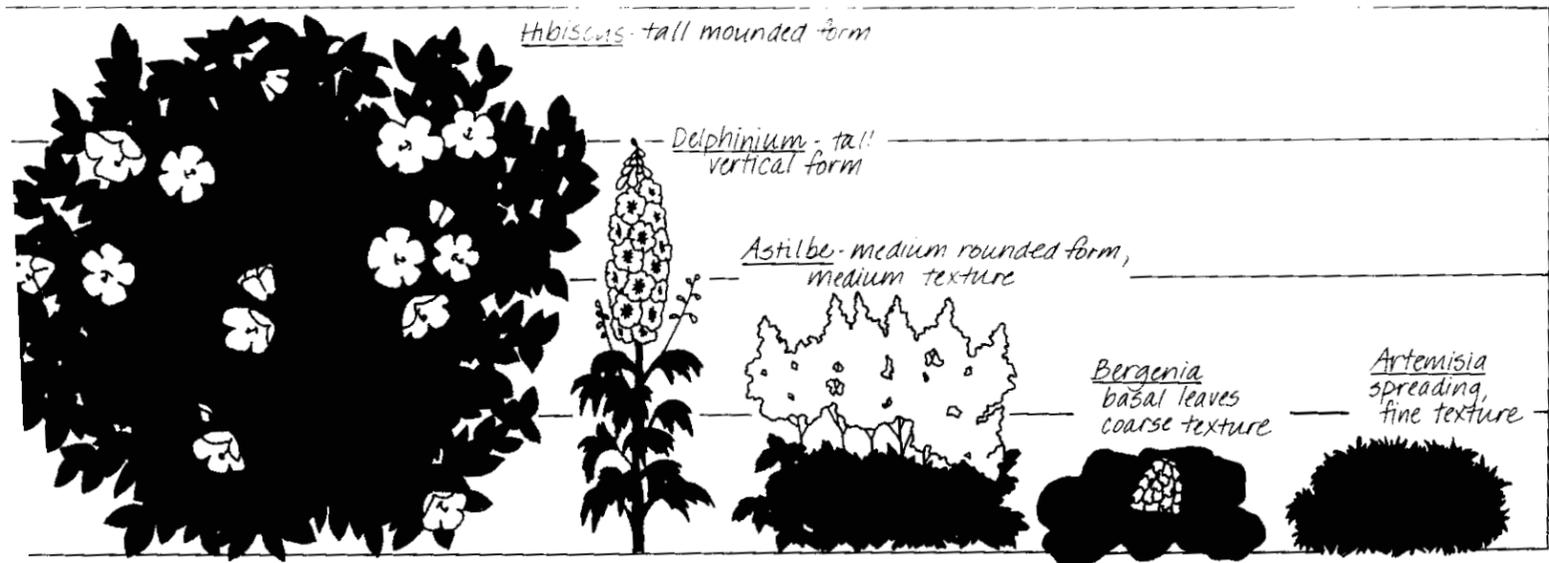
EXISTING YARD



FORMAL DESIGN



Perennials are available in many heights, shapes and textures.



low or high points and shaded areas of the property. Determine the soil type(s) such as clay, sand or loam; acid or neutral; well drained or poorly drained.

Step #3: Decide on style—either informal or formal.

An informal style follows the natural terrain by using curved, flowing lines. It creates balance without being symmetrical and highlights existing and future plant specimens. A formal style uses straight, geometric lines to determine the shape of the bed. It often relies on symmetry, i.e., matching one side of the garden with the other. The rectangular shape can be repeated in other architectural elements, such as the house, pool, lawn or patio.

Most decisions on style are a matter of personal preference. Here are a few points to consider:

- If your property has no outstanding natural features and is relatively flat, you may use either style.
- If your yard is irregularly shaped with slopes, hills, rock outcroppings or mature specimen trees, the informal style is preferred.

- Consider the style of the house and select the style of garden that will complement it best.

Step #4: Choose type of display.

Three types of displays are commonly used for perennial gardens—the border, the island bed and the naturalized area. A border is a cultivated area that bounds an expanse such as a lawn, walkway, driveway or wall. If it is flush against a wall or hedge, the border should not be any wider than 4 to 6 feet for ease of maintenance. For a wider border, plan a narrow path between the wall and the garden for access. The path will be hidden from view and will improve air circulation behind the tallest plants, which should reduce disease problems. For a pleasing relationship between the depth of the border and the size of the yard, do not allow it to exceed one-quarter of the total width of your yard.

An island bed is a cultivated area surrounded by an open expanse, such as a lawn. It is accessible from all sides, which makes it easier to maintain. It admits more sunlight and encourages better air circulation. This type

of display can break up large, open areas.

You do not need to segregate perennials in the garden. Many can be naturalized along a stream, in lowlands or in dry meadows so that they look as if they are part of the natural landscape. Some can be naturalized in lawns or ground covers, and a number can be used as ground covers themselves. You can use many wildflowers and ferns in such locations.

Step #5: Select plants.

When selecting plants, make a list of your favorites. Consider the space limitations of the site: would smaller, compact plants be appropriate? Should taller plants with spreading habits be included? Match the soil type, light levels and site climate with the requirements of preferred plants. Carefully consider individual plant characteristics, as well as the overall character of the garden. Several books and catalogs on perennials are available and include pictures and other information that can help you select plants.

Plant Form

Each perennial has a general shape or form. Basic forms are vertical or columnar, such as delphinium; mounded, such as astilbe; and horizontal or prostrate, such as creeping phlox. Most perennials fall in between these three forms. Use a variety of forms to create the most pleasing effect.

Height

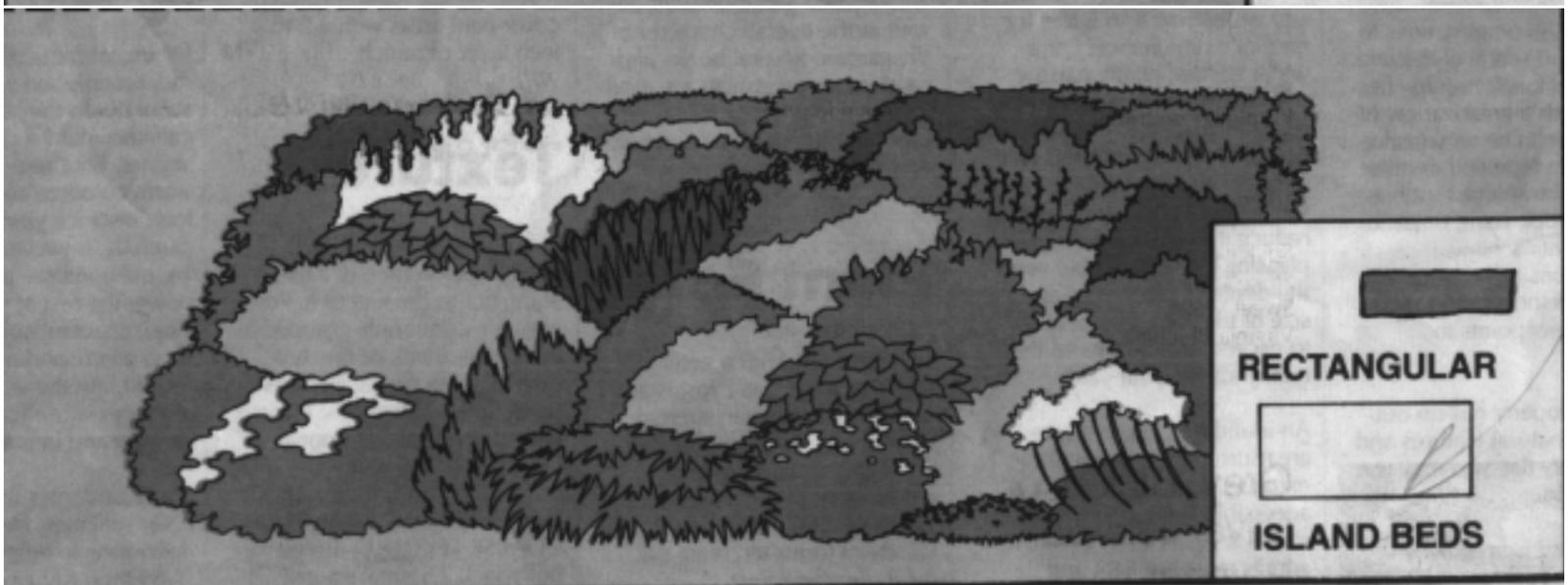
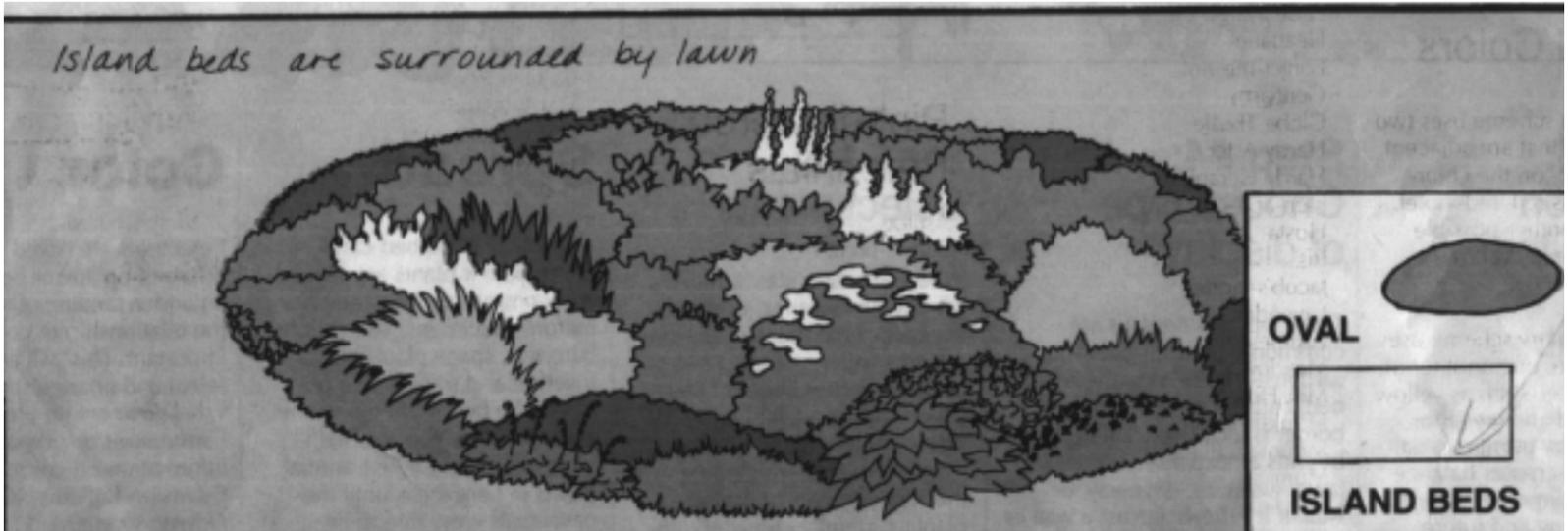
Perennials vary in height from the tiny *Thymus pseudolanuginosus* (woolly thyme)—about 1/2 inch tall—to the lofty *Hibiscus moscheutos* (rose mallow)—up to 8 feet tall. The standard method of arranging heights is “stair-stepping.” Shorter plants are placed in front, medium height plants in the middle and taller plants in the back. Break up this progression a bit to keep the garden interesting and more natural. Be careful not to completely hide smaller plants behind taller specimens.

Spread

A newly planted bed can look rather bare if plants are spaced at recommended distances for mature specimens. To avoid this bareness, space plants closer together and transplant a few out of the bed as they become crowded. This will also help control weeds. Or use annual plants in bare areas until the perennials grow into their allotted space. You also can cover bare areas with a 2- to 4-inch layer of mulch. The plants will fill in the bare spaces as the garden matures over a few years.

Texture

This characteristic refers to the overall appearance of a leafy plant, not to the feel of it. Perennials are commonly grouped as coarse, medium or fine textured. Create spatial illusions by using different textures. Plants with coarse textures appear closer than they really are, while those with fine textures recede into the distance. Examples are: coarse texture—bergenia, hollyhock, Oriental poppy; medium texture—astilbe, iris, rudbeckia; fine texture—‘Silver Mound’ artemisia, baby’s breath, lavender.



Color

Perennials are noted for their usually short-lived but remarkable flower color. Thus, an understanding of color and the relationship of colors is important. This will allow you to

select and arrange species and cultivars to create pleasing and harmonious displays. (For more information on color use, see Extension bulletin NCR-211, Flower Arranging, for sale only.)

Warm, vibrant colors, such as red, orange and yellow, tend to stand out in the landscape. They can also make a distance seem shorter. For these reasons, use warm colors as accents or for long-distance viewing. Use them carefully, how-

ever, because they are quite intense and can overpower the rest of your garden. Cool, peaceful colors, such as blue, green and purple, tend to recede into the landscape. They are especially effective for close

viewing and in masses.

Many gardeners use various color schemes.



ACHILLEA
MILLEFOLIUM

Using One Color

A monochromatic scheme includes different flowers that have various tints and shades of a single color, such as blue. Another popular color is white. Several famous gardens are fashioned around an all-white theme, such as the white garden at Sissinghurst Castle in Kent, England, designed by Vita Sackville-West after World War II. Choosing a particular color can be especially effective in complementing the color of your house.

Using Several Colors

An analogous scheme uses two or more hues that are adjacent or neighboring on the color wheel, such as red, red-violet and violet. Another possible scheme is orange, yellow-orange and yellow.

A complementary scheme uses colors opposite each other on the color wheel, such as yellow and violet, red and green, or orange and blue. White-flowered and

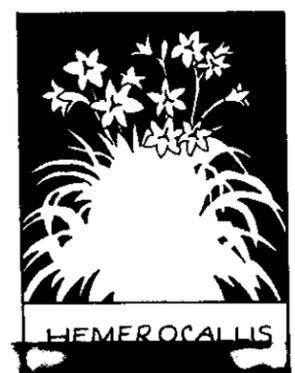
silver-leaved plants may be used to blend areas where colors meet.

A semi-chromatic color scheme divides the color wheel in half and uses any three adjoining colors, such as blue, violet and red; or red, orange and yellow. This approach is very popular today.



MISCANTHUS

A polychromatic scheme includes any and every combination of colors. This type of design yields a great variety of colors and can be very festive. It is important to note, however, that even gardens of this type with seemingly haphazard arrangements achieve their success only through careful planning.



HEMEROCALLIS

COLOR GUIDE

Blue to Purple

Ajuga
Aquilegia
Aster
Brunnera
Campanula
Centaurea montana
Delphinium
Erigeron
Hosta
Iris
Lavandula
Liatris
Linum perenne
Mertensia
Nepeta
Phlox
Platycodon
Salvia
Tradescantia
Veronica
Viola

Pink to Red

Achillea millefolium
Anemone
Armeria
Aster
Astilbe
Centranthus
Dendranthema

Dianthus
Dicentra
Echinacea
Eupatorium
Geranium
Hemerocallis
Heuchera
Iris
Lobelia cardinalis
Lychnis
Paeonia
Phlox
Physostegia
Saponaria

Yellow to Orange

Achillea
'Coronation Gold'
Anthemis tinctoria
Asclepias tuberosa
Aurinia saxatilis
Coreopsis
Dendranthema
Euphorbia
Gaillardia
Geum
Helenium
Helianthus
Heliopsis

Hemerocallis

Iris
Ligularia
Lysimachia punctata
Oenothera
Papaver orientale
Rudbeckia
Sedum
Trollius

White

Arabis albida
Aruncus
Aster
Astilbe
Cerastium
Dendranthema
Dianthus
Dicentra
Dictamnus
Echinacea
Galium
Goniolimon
Gypsophila
Hosta
Iberis
Iris
Leucanthemum
Paeonia
Phlox
Veronica
Yucca

Gray to Blue Foliage

Achillea
Artemisia
Cerastium
Dianthus
Echinops
Festuca cinerea
Gypsophila
Lavandula
Sedum
Thymus

Variiegated Foliage

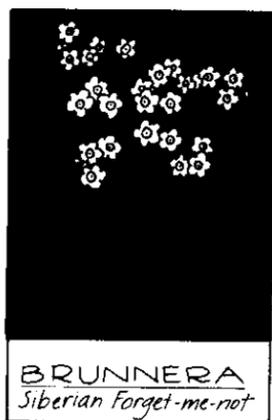
Aegopodium
Ajuga
Heuchera
Hosta
Lamiastrum
Lamium
Miscanthus
Polygonatum
Pulmonaria
Sedum
Thymus

Time and Duration of Bloom

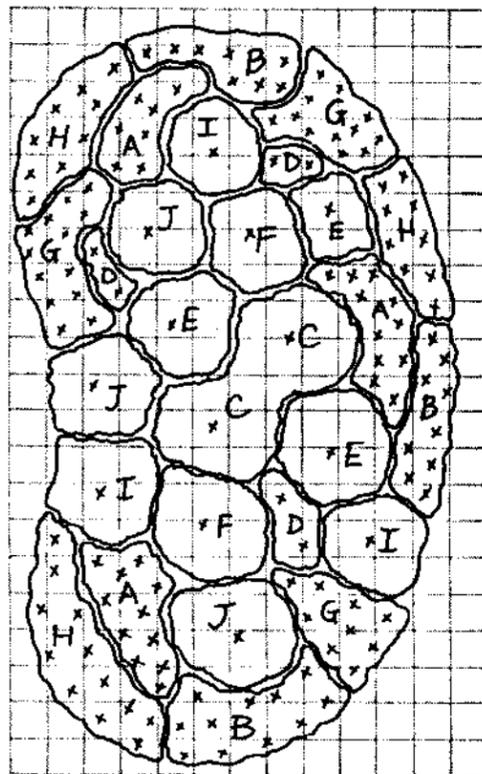
Perennials vary considerably in when and how long they flower. A bloom chart, such as the one in the back of this bulletin (p. 27), will help you coordinate flowering periods to prolong a colorful display or to concentrate color during a particular time. If you own a summer home, for example, you might want to plant an August-flowering perennial bed. If you live in your home year round, you might want to plan a garden for spring, summer and fall color.

Although perennials can provide continuous bloom throughout the growing season, there are usually three or four peak periods when the display is at its best.

Remember also that perennials are grown for other attributes than flowers. Colorful or interesting foliage and fruit, unique forms and fragrance also provide interest. In a garden timed for continuous blooming, expect to see a fair amount of green foliage with intermittent flowers, rather than a solid mass of color. (See the Bloom Chart on page 27.)



This bed is designed to provide continuous bloom throughout the growing season.



'x' represents placement of i.

- A. *Arabis caucasica*
- B. *Phlox subulata* 'Emerald Pink'
- C. *Hemerocallis* 'Hyperion'
- D. *Geum borisii*
- E. *Trollius europaeus* 'Superbus'
- F. *Lavandula angustifolia*
- G. *Campanula carpatica*
- H. *Oenothera missouriensis*
- I. *Rudbeckia fulgida* 'Goldsturm'
- J. *Sedum* 'Autumn Joy'

PUTTING IT ALL TOGETHER

Using the grid sheet, determine the approximate location, size and shape of the perennial bed or border. Draw an outline of the bed alone on a second sheet, using a larger scale, such as 1 inch = 1 foot or 1/2 inch = 1 foot. Lightly pencil in approximate height requirements of plants in certain regions of the garden: tallest plants in the back of a border or in the center of an island bed. Keep in mind your color scheme and desired plant heights; consult the table on selecting perennials (p. 20) to choose plants that meet these require-

ments. Be sure to include your favorites as well as species that provide special attributes, such as fragrance. Take into account design factors such as form, spread and texture, as well as cultural requirements, to create a varied, interesting display. Make up a tentative plant list and check availability in catalogs. Be sure to repeat some perennials to keep the garden unified in appearance. Decide how



many of each perennial you need, based on recommended plant spacings. Use groups of three to six for best results.

Perennials for Beginners

Achillea
Arabis
Brunnera macrophylla
Coreopsis
Dicentra spectabilis
Echinacea purpurea
Heliopsis helianthoides
Hemerocallis
Hosta
Miscanthus sinensis
Nepeta
Phlox subulata
Physostegia virginiana
Rudbeckia fulgida 'Goldsturm'
Sedum 'Autumn Joy'

CULTURE OF PERENNIALS

Prepare the Soil

It's a good idea to test your soil in the fall to determine the pH and the nutrients required. Your county Cooperative Extension Service office can provide information on how to take a soil sample and may be able to help interpret the results. Soil tests conducted by professional laboratories are generally more accurate than those made with inexpensive soil testing kits. If you wait until spring to test the soil, it may take a few weeks to obtain the results because soil testing labs are busiest at that time.

Prepare beds in the fall before spring planting so the soil can settle.

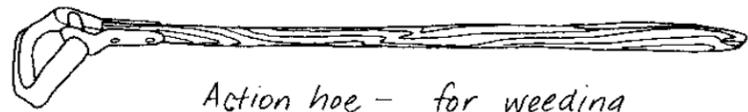
You can prepare beds in the spring as long as you allow sufficient time for the soil to settle before you plant—at least 2 weeks—or after one good, soaking rain. If you transplant in extremely loose soil, the crowns may end up an inch or so higher than you

intended. If this happens, add additional soil or mulch. This can be a problem after rototilling, which fluffs up the soil.

Use a garden hose to establish the outline of each bed or border. The hose will not get in the way of digging as will a string and stakes. It can be moved easily and is especially useful when laying out curved or circular beds.

Work the soil to a depth of 8 to 10 inches, or at least deep enough to provide adequate space for the plants' root systems—perhaps only a few inches for a rock garden. Incorporate organic matter, such as peat moss, compost or leaf mold at this time—up to 4 inches, if available. You can use hand tools or power tillers. If the bed site has poorly drained soil, select species that will tolerate moist or wet sites (see Perennials with Special Features on page 18), raise the bed to improve drainage or choose a better site.

Simple Tools for Perennial Culture



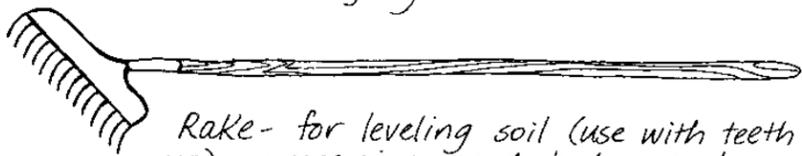
Action hoe - for weeding and cultivating



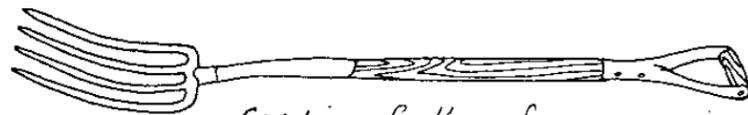
Hand trowel - for setting small plants



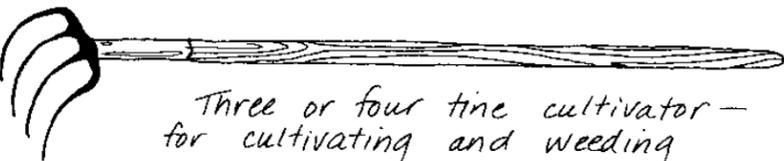
Long-handled square point spade - for planting, preparing beds, edging.



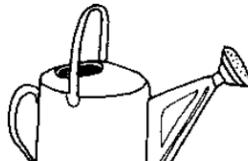
Rake - for leveling soil (use with teeth up), preparing seed beds, and spreading or loosening mulch



Spading fork - for preparing beds and dividing large plants

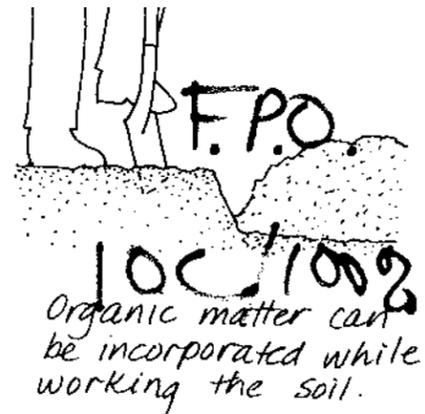


Three or four tine cultivator - for cultivating and weeding



Watering can and garden hose -

Preparation of beds is important because it will be a long-term planting.



Eliminate all Weeds

You must eliminate all weeds during this initial soil preparation period before plants are added or seeds are sown. Untold difficulties arise when perennial weeds, such as bindweed or quackgrass, grow through a carefully planted bed. Because of the diversity among perennials, it is risky to chemically treat weeds in close proximity to valuable plantings. It may be possible, however, to treat individual weeds with a herbicide recommended for use on perennials.

Work the bed for one year before planting to kill all weed seedlings as seeds germinate.

Fertilization is Important

You may need to apply fertilizer when you prepare the beds. Follow the recommendations of the soil test report. If you didn't test the soil, apply a complete fertilizer, such as 5-10-5, at a rate of 2 pounds (4 rounded cups) per 100 square feet. Work the fertilizer into the soil as you prepare the bed.

The ideal soil pH for most perennials is slightly acidic (6.0 to 6.8). If the pH is too low or too high (as determined by a soil test), adjust it at the same time you apply fertilizer. To raise the pH (make it more alkaline), add ground limestone as recommended by the soil test report, or at the rates indicated in Chart 1.

To lower the pH (make it more acidic), add sulfur, ferrous sulfate (iron sulfate)

or aluminum sulfate as recommended by the soil test report, or according to the rates in Chart 2. Rates for aluminum sulfate and iron sulfate need to be five times those given for sulfur.

Adding generous amounts of organic matter will also help to lower soil pH and keep it at the desired level. Normally, pH needs to be adjusted only once, but it is desirable to test the

soil the following year to be sure the pH is at the recommended level. If not, top-dress the soil with limestone or aluminum sulfate.

To increase soil moisture retention, spread a 2- to 3-inch layer of mulch over the surface of newly prepared beds. Use bark chips, leaf mold, pine needles, well rotted sawdust or compost. This will also help suppress weeds and

increase plant hardiness. Apply only a thin layer of mulch to heavier clay soils because these soils do not drain as rapidly and may stay wet too long. You may need to add organic mulch each year as it decomposes. Plastic mulch is not recommended. Rock mulch is best used only in rock gardens.

CHART 1.
Pounds of ground limestone needed per 100 square feet to raise pH to 6.5.

Soil pH	Sandy loam	Loam	Clay loam
5.0	8	10	15
5.5	6	8	10
6.0	3	4	6

CHART 2.
Pounds of sulfur needed per 100 square feet to lower pH to 6.0.

Soil pH	Sandy loam	Loam	Clay loam
7.5	1.8	2.5	3.9
7.0	1.4	2.0	3.1
6.5	0.8	1.2	1.9

GETTING STARTED

Choosing Perennials

Perennials are available in many forms: as seeds, as dormant bare-root plants, in seedling packs like annuals, in 4- and 6-inch pots, and in 1-gallon containers. Larger plants represent a considerably larger investment than their smaller counterparts. However, they will produce a full look sooner and you may see each plant's foliage and possibly flowers before you purchase it. Although more wildflowers and ferns are becoming available, you usually have to obtain the more unusual ones from specialized nurseries.

Many nurseries now offer perennials as first-year seedlings in plastic "cell packs." These plants might take an extra year to establish, but the cost per plant is considerably less.

Try to choose only fresh, green plants that are bushy and compact. If plants have flowers, remove them at planting time.

Mail-order businesses generally wait to ship dormant plants until the weather is suitable for planting. However, many of these companies operate in southern states and plants sometimes arrive when snow is still on the ground in the north. In such cases, store dormant plants in a cool, dark location where the temperature stays above

freezing, and keep the packing material slightly moist. If the holding temperature is not below 50°F, watch the plants closely because they may yellow and deteriorate if they are kept longer than one to two weeks. Wrap the plants loosely in plastic and keep in a refrigerator if you have room. If not carefully protected from desiccation, the plants will deteriorate very quickly.

Another way to handle newly purchased bare-root plants is to pot them in containers and grow them in a protected area, a coldframe, a cool greenhouse or similar structure until you can safely plant them in their permanent location. Or plant

bare-root plants directly in the ground, if it's workable, in the corner of a garden or small nursery. A light, sandy, well drained soil is desirable. Cover plants with slitted row covers or similar plant protectors until the danger of hard frost has passed. Be sure the protectors are ventilated, or remove them on sunny or warm days. Then move plants to their permanent location. Or, if small, allow them to grow for a year before transplanting.

Many perennials are relatively trouble-free and grow best in a loose, moderately fertile loam with adequate moisture. The best time to plant

most perennials is in the spring because the plants will establish a good root system before winter. This will also reduce the possibility of heaving, a common problem with poorly established perennials in northern climates. You can also plant new divisions in late summer, but be sure the roots have at least a month to develop before cold weather sets in. A few perennials are at their best when planted in August: bearded iris, Oriental poppy, peony and many woodland wildflowers. Potted perennials can be planted any time during the growing season.

Growing Perennials from Seed

Many perennials can easily be grown from seeds, such as columbine, delphinium and rudbeckia.

Use small pots or trays containing cell packs to start seeds. A standard, well drained growing medium works well for most perennials. Seed packets should include essential information, such as when to sow, how deeply, germination temperature and other information. Sow seeds at the recommended rate and time (spring, summer or fall) in a sterile

medium, either scattered (broadcast) or in rows, and cover them with the recommended amount of growing medium (usually about two to three times the diameter of the seed).

Label the containers and water very carefully to avoid washing away the seeds. Use a fog-type nozzle or let the containers stand in a shallow tub of water to avoid disturbing the seeds.

Place the containers in a warm location where the soil temperature is at least 70°F. Cover with plastic to keep the medium moist. As soon as most of the seeds have germinated, remove the plastic

and move the containers to a cooler location (60 to 65°F) in bright light to harden seedlings.

You can also start seeds in outdoor seedbeds either in an open or a protected area, such as a coldframe. The seedbed should have porous, well drained soil that you have prepared thoroughly, leveled, tamped with the back of a rake and leveled again before seeding. After preparing the bed, sow the seeds and cover, following directions on the seed packet. Moisten the seedbed with a fog-type hose nozzle and be careful not to wash away the seeds.

Fertilizing Seedlings

Fertilize the plants as soon as the leaves expand, using a complete fertilizer such as 20-10-20 at the recommended rate and frequency listed on the product label. If the frequency is listed as once a month, you should probably fertilize more frequently at reduced rates, e.g., once a week at one-fourth the monthly rate. Watch for pests, such as diseases, insects and mice (when overwintering in coldframes). You may want to use a fungicide to help control damping-off in addition to using a sterile growing medium.

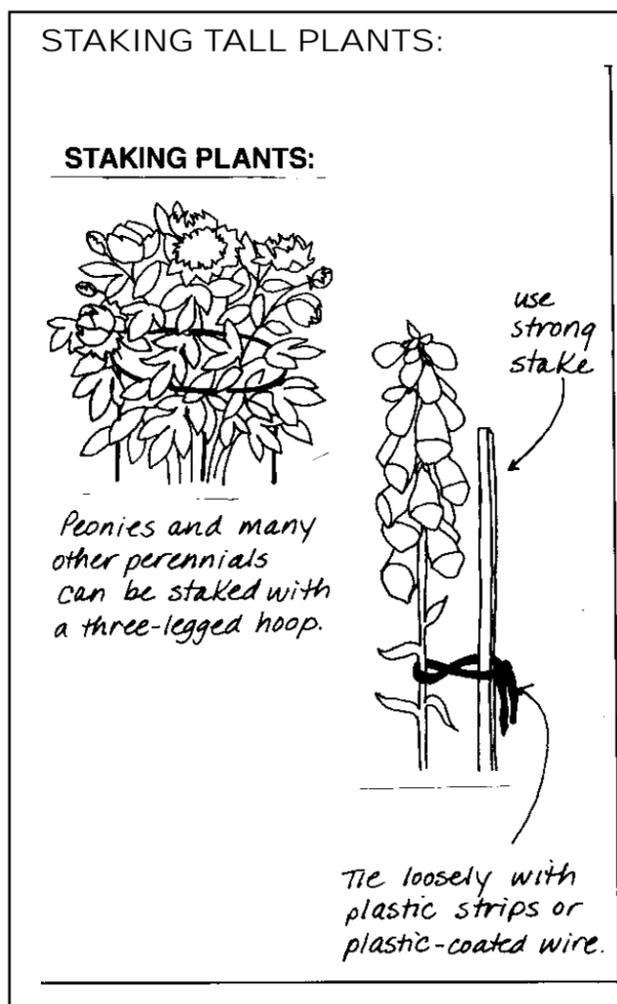
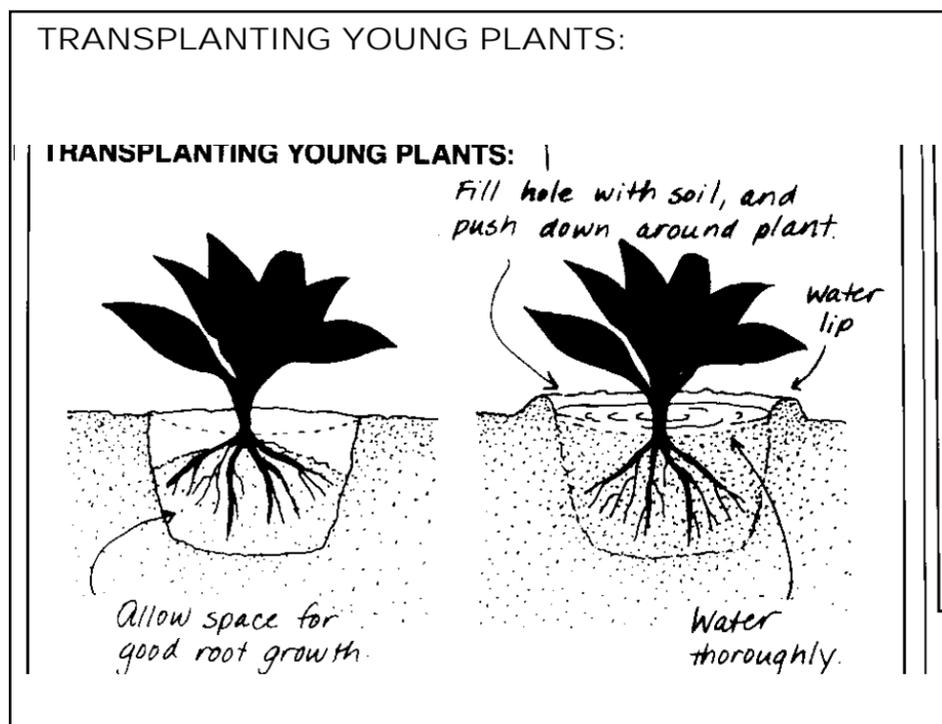
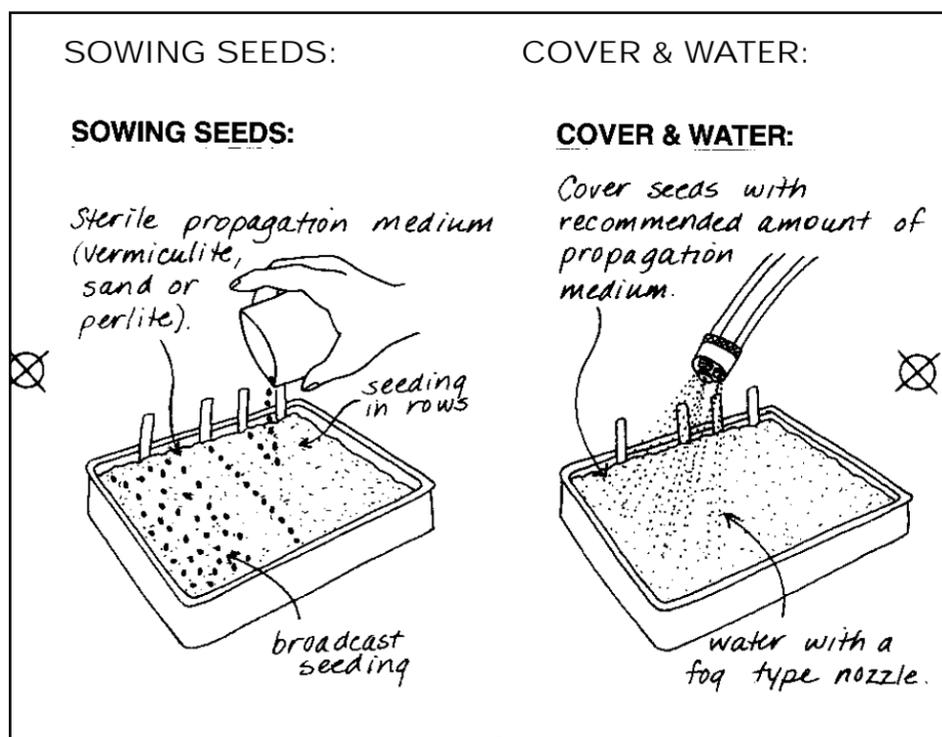
Transplant seedlings to larger containers (4 to 5 inches) as soon as root systems have developed throughout the growing medium. Overwinter seedlings of most species in a protected location, such as a coldframe, until final transplanting the fol-

lowing spring. Be sure to watch for mice and rabbits.

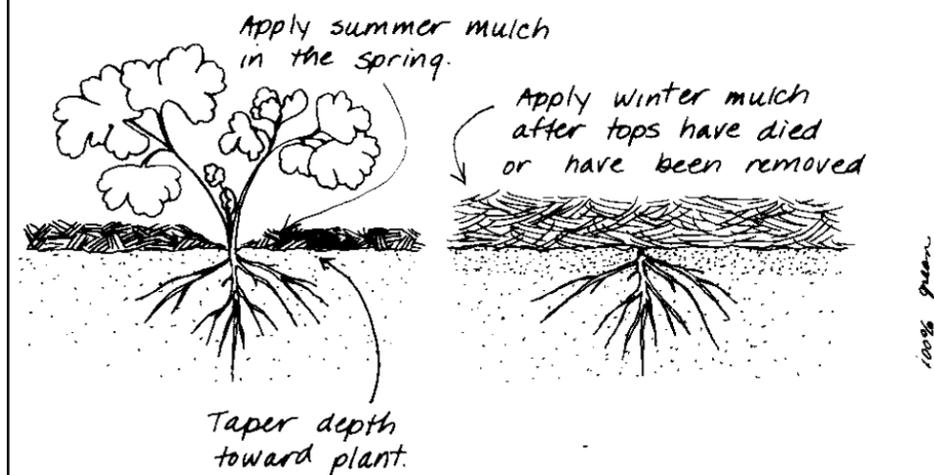
Transplanting to the Garden

The best time to transplant young plants, whether grown from seeds or cuttings, is in early spring after the soil has thawed but the plants are still dormant. This is usually 4 to 6 weeks before the average date of the last freezing temperature in the spring. (See the Spring Freeze map, page 32, for average times for your location.)

Use stakes to mark where the plants will go before you set them out. Be sure to allow enough space. Dig holes in prepared beds using a trowel or spading fork. Make the holes large enough so that roots have plenty of room and plant at a depth to accommodate each



MULCHING:



root system. Firm the soil around the roots so there are no empty spaces between roots and soil. Water thoroughly.

Maintenance

Water the perennial garden when soil becomes dry. This will vary with soil type. Watch new beds for signs of wilting. Young, newly planted perennials will need more frequent watering than mature, established plants. Water thoroughly and try not to splash water on the foliage. Use a trowel to check the soil for moisture—soil should be moist 4 to 5 inches deep. It is better to water thoroughly and less frequently than to apply many superficial waterings.

Apply a 2-inch layer of mulch over the bed or border every spring, tapering it off gradually near each plant. You may apply a layer of winter mulch 4 inches deep after the soil is frozen to a depth of 2 inches. This helps prevent winter injury, especially heaving. If you apply mulch too early, rodent problems may develop. Use an open, fluffy material, such as pine boughs, pine needles or excelsior over the entire bed. Remove this layer the follow-

ing spring after the danger of severe frost has passed. A winter mulch can help unreliably hardy plants survive the winter.

Staking Tall Plants

You may have to stake tall plants as they grow. Stake each stem individually instead of trying to tie them all together. Tie the plant to the stake with plastic strips or wire covered with a plastic coating. Make a double loop of the wire with one loop around the plant and the other around the stake. This keeps the stem from rubbing against the stake. For tall, arching plants, make or purchase circular rings and attach them to the stakes to support plants and to maintain their natural form. A three-legged support called a peony hoop is less obstructive than poles in the garden. Tomato cages can be used in the same way.

Fertilizing

If desired, apply fertilizer as growth begins in the spring. Because many soils have adequate phosphorus and potassium but are deficient in nitrogen, use a complete fertilizer every 3 or 4 years and supplement it with a nitrogen-based fertilizer other years. However, most perennials are not heavy feeders. Organic matter added

at the time of planting can provide sufficient nutrients for many years and eliminate the need for fertilizer. Exceptions are astilbe, chrysanthemum, delphinium, lupines and summer phlox, which should be fertilized every year. If plants are not vigorous and foliage is light green or yellowish, applying a nitrogen-based fertilizer would probably be beneficial.

Weed Control

Cultivate perennials as frequently as needed to control weeds. Most weeds can be killed by using an action hoe or a similar tool (see illustration of tools). Work the top half-inch of the soil. If you cultivate much deeper, you can injure plant roots. Frequent, shallow cultivation is better than occasional, deep cultivation. Try not to walk in the beds while weeding. Soil can be easily compacted, which limits root growth.

Blooming

“Dead-head”—that is, remove old flower heads—after blooming unless the fruits are ornamental. This prolongs the flowering period of many perennials, especially dianthus, coreopsis and shasta daisy.

A few species will bloom a second time if the stems are cut back after flowering. Examples are del-

phinium, false indigo and globe thistle. The flowers won't be as numerous on the regrowth, but cutting back does result in a longer, although not continuous, flowering period.

Zones 4 to 6, divide plants in the spring while they are still dormant. This avoids subjecting the newly divided plants to harsh winter temperatures and reduces the chances of heaving.

The method of division varies among types of perennials. In general, vigorous new shoots from the outside of a clump are preferred for replanting, but you can use all shoots, if desired.

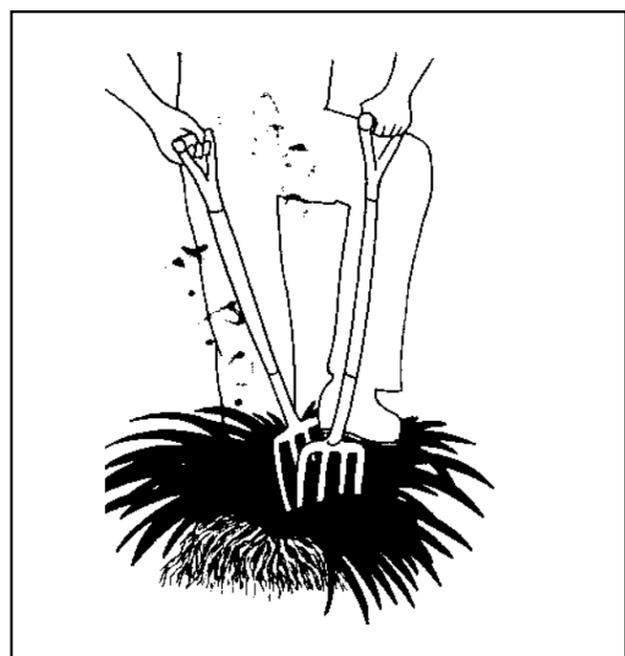
Propagation Methods

Dividing

Many vigorous perennials crowd themselves and require dividing every few years. Also, the most aggressive types can escape and choke out other plants around them. Dividing is often done in the fall in warmer areas of the country, but in

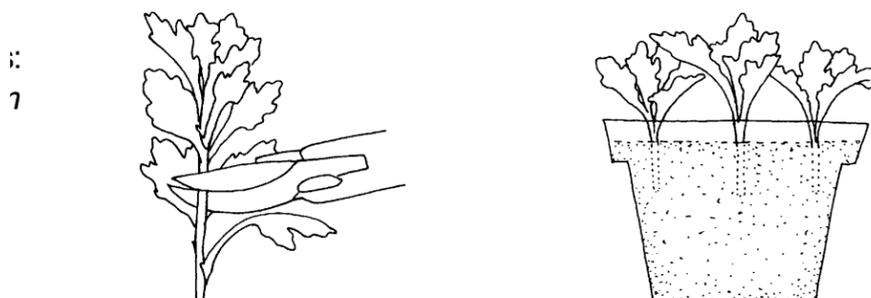
To make digging easier, water the bed well a few days beforehand if the soil is dry. Before dividing, prune the plants by half if stems are still present. Dig out the entire clump. Divide the healthy living portions into smaller clumps by working

DIVIDING PLANTS:



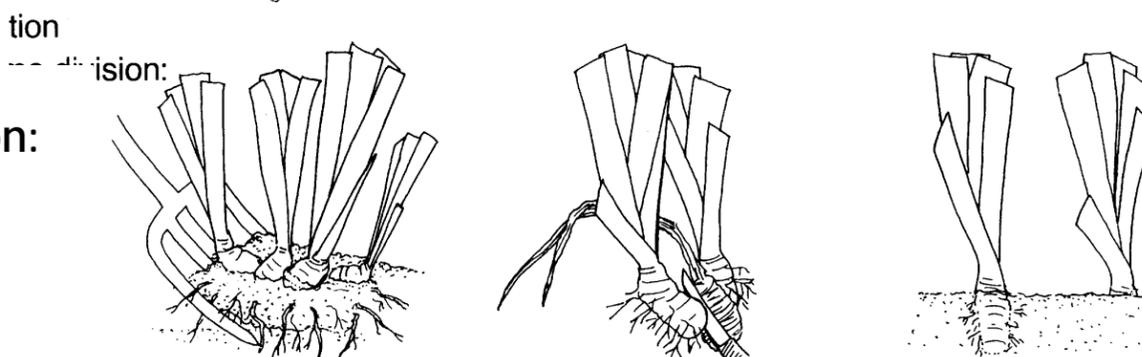
OTHER METHODS OF PROPAGATION

Propagation by stem cuttings:
Dendranthema grandiflora
 (Garden mum)



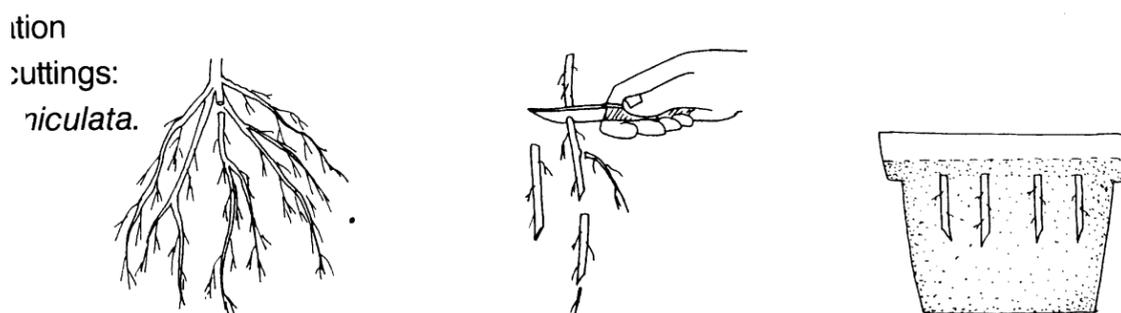
For stem cuttings, such as of chrysanthemum, cut off actively growing shoot tips and remove the lower leaves. Application of low strength rooting hormone will generally enhance rooting. Place in a well-drained propagation medium and keep well watered.

Propagation by rhizome division:
Iris
 (Bearden iris)



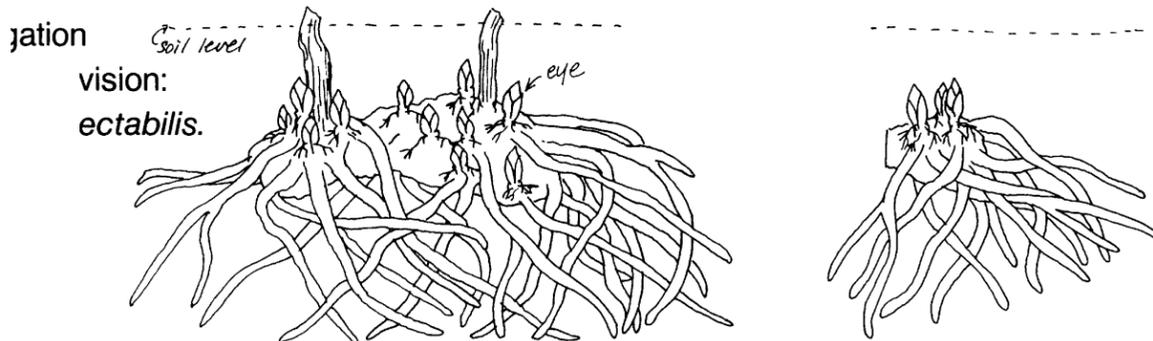
Lift a clump of plants with a spading fork. Cut off and discard old rhizomes from the current season's growth. Replant healthy rhizomes at the same depth they had been growing.

Propagation by root cuttings:
Phlox paniculata
 (Garden phlox)



Cut off young roots close to the crown and return the parent plant to the garden. Distinguish top of cutting from bottom by the angle of the cut. Remove any fibrous lateral roots and treat with fungicide powder. Plant with the bottom end down in a well-drained propagation medium. Water just enough to keep soil from drying out.

Propagation by crown division:
Dicentra spectabilis
 (Old-fashioned bleeding heart)



Dig roots and crown with a spading fork in the fall. Lift carefully so as not to break roots, and knock off excess soil. Cut crown into sections, each having one or more eyes (more eyes will give a bigger plant next year). Cover with plastic to prevent desiccation and replant as soon as possible at the same depth they had been growing.

them apart with your fingers or making small cuts with a knife. Divide large, dense clumps using two spading forks back-to-back. In general, replace one or two healthy divisions in the original hole and plant the others elsewhere.

Some species have large taproots and should not be divided or moved unnecessarily. Examples are baby's-breath, balloon flower, butterfly weed and lupine.

Other Propagation Methods

There are several other ways to propagate perennials. You can propagate chrysanthemums by stem and root cuttings; iris by rhizome pieces; anemone and perennial phlox by root cuttings; and peonies and bleeding-heart by taking roots with one or more "eyes." Consult other gardeners, catalogs or books for more details on specific methods.

CONTROLLING DISEASES AND PESTS

Prevention

Although most perennials have few major disease or insect problems, several pests can attack them.

These pests vary in type and severity from area to area and year to year. You can control most of them effectively if you follow these general recommendations:

- Buy plants that are free of diseases and insects.
- Buy disease-resistant species when available.
- Keep your garden free of weeds, fallen leaves, and diseased or insect-infested plants.
- Remove seriously diseased or insect-infested plants as soon as you notice them.
- Apply fungicides and insecticides only as needed.

If a serious problem develops, consult your local garden center or Cooperative Extension office for the best control methods. Select natural or processed pesticides by studying the information below and on pesticide container labels. Follow label directions for dilution and care in handling.

Three types of pesticides are used on perennials: fungicides for diseases, insecticides for insects and miticides for spider mites. These are usually applied as dusts or sprays. Some come ready to use.

Diseases

Of the many diseases that attack perennials, aster yellows, botrytis blight, powdery mildew and rust are the most serious.

Aster yellows (mycoplasma) causes the yellowing of leaf tips and flowers, also stunting of the plant and abnormal growth. Leafhopper insects carry this disease from plant to plant. Asters, mums, statice and some others can get aster yellows.

The only cure is to remove the infected plants and to control leafhoppers.

Botrytis blight (fungus) is a gray mold that attacks leaves, stems and flowers. Most flower petals are susceptible, especially peony flowers in wet weather and shasta daisy in late summer during times of heavy dew.

Leaf blotch can be caused by other fungi as well. Brown spots are a common problem on peony, iris and mum.

Root rots (fungus, bacteria) can be serious problems for perennials in moist soil. The best solution is to improve soil drainage, especially over winter, or move the plant to a more suitable location.

Powdery mildew (fungus) covers leaves with a whitish substance. Avoid overcrowding and planting in wet or shady locations. It often occurs on monarda, phlox and delphinium.

Rust (fungus) causes reddish brown spotting on leaves, young stems and flower parts. Rust is common on hollyhocks.

Insects

The most common insects that attack perennials are aphids, beetles, caterpillars, leafhoppers, spider mites, thrips and, occasionally, tarnished plant bugs.

Aphids are small, sucking insects that are concentrated at the tips of young shoots, on stems and on the undersides of leaves.

Beetles feed on leaves, stems and flowers.

Caterpillars usually feed on leaves.

Leafhoppers are small, leaping insects that feed on many kinds of plants by sucking sap.

Spider mites are very tiny pests that feed on leaves and stems. Look for fine webs to indicate their presence. They are usually located on the undersides of leaves. Mites thrive in hot, dry weather. They are very difficult to see without a magnifying glass (look for movement). Shaking the leaves over a white paper is another way of determining their presence.

Thrips are very small insects, sometimes with wings, that suck sap. Leaves may be finely mottled. Thrips will attack growing points and flowers.

BOOKS FOR FURTHER READING

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Boston: Houghton Mifflin, 1992.

Additional Information

Many publications are available on perennials, wildflowers, ferns and related topics, and a few are listed. Several gardening magazines include articles on perennials, often on specific kinds or species. Nursery catalogs and libraries are additional sources of information.

Many gardeners specialize in growing one or more species of perennials, and there are even organizations devoted to perennials or certain groups of plants, such as chrysanthemums, daylilies, delphiniums, hostas, penstemons, irises, peonies, primroses, ferns, herbs, rock gardens and wildflowers.

For more information, contact:

American Horticultural Society
Box 105
Mount Vernon, VA 22121

The A.H.S. has a list of plant societies and national horticultural organizations.

Perennial Plant Association
Room 217
Howlett Hall
2001 Fyffe Court
Columbus, OH 43210

Membership is limited to nursery people and professional horticulturists.

Andersen Horticultural Library
Minnesota Landscape Arboretum
3675 Arboretum Drive
Chanhassen, MN 55317
612/443-2440

The Source List of Plants and Seeds, compiled by the library, lists nurseries carrying specific cultivars of many perennials.

PERENNIALS WITH SPECIAL FEATURES

SHORTER PERENNIALS

• indicates perennials that are good for rock gardens

Aegopodium podagraria, 12 inches
Ajuga spp., 6 inches
Aquilegia spp., 12-36 inches
Arabis albida, 12-18 inches; spreading •
Armeria maritima, 6 inches •
Artemisia schmidtiana, 12-36 inches
Aster alpinus, 6-12 inches •
Astilbe X arendsii, 12-24 inches; mound
Aubretia deltoidea, 6 inches •
Aurinia saxatilis, 6-12 inches •
Bergenia cordifolia, 12-18 inches
Brunnera macrophylla, 12-18 inches
Campanula carpatica, 12 inches •
Cerastium tomentosum, 6-12 inches •
Cerastostigma plumbaginoides, 6 inches
Convallaria majalis, 6-12 inches
Dianthus spp., 6-18 inches •
Dicentra eximia, 12-18 inches
Doronicum caucasicum, 12 inches; mound
Epimedium spp., 9 inches •
Euphorbia epithymoides, 12-13 inches •
Festuca cinerea, 12 inches; mound
Gaillardia X grandiflora, 6-24 inches
Galium odoratum, 6 inches
Geranium spp., 6-18 inches •
Helleborus spp., 12-18 inches
Heuchera sanguinea, 12-30 inches
Hosta, 12-48 inches
Iberis sempervirens, 6-12 inches •
Incarvillea delavayi, 12-18 inches
Iris hybrids, 4-15 inches •
Lamium maculatum, 6 inches
Lavandula angustifolia, 12-36 inches
Leontopodium alpinum, 6 inches •
Leucanthemum X superbum, 12-48 inches
Liriope spicata, 12 inches
Myosotis spp., 12 inches; trailing
Nepeta X faassenii, 12-18 inches
Oenothera missouriensis, 12 inches; spreading
Opuntia humifusa, 6 inches
Penstemon spp., 6-30 inches
Phlox subulata, 3-6 inches •
Polygonatum spp., 12-36 inches
Polygonum affine, 12 inches; spreading
Potentilla spp., 6-12 inches •
Primula spp., 6-12 inches •
Prunella X webbiana, 12 inches; spreading
Pulmonaria saccharata, 12-24 inches; spreading
Salvia spp., 12-36 inches
Saponaria ocymoides, 8 inches •
Scabiosa caucasica, 12-18 inches
Sedum spp., 3-12 inches •
Sempervivum spp., 6 inches •
Stokesia laevis, 12-18 inches
Thymus spp., 3-12 inches
Veronica spp., 6-30 inches •
Viola spp., 12 inches; mound

TALLER PERENNIALS

Achillea X 'Coronation Gold', 4-5 feet
Aconitum spp., 3-5 feet
Anemone X hybrida, 2-4 feet
Anthemis tinctoria, 2 feet
Aruncus dioicus, 5 feet
Asclepias tuberosa, 2-3 feet
Aster novae-angliae, 2-5 feet
Baptisia australis, 3-4 feet
Belamcanda chinensis, 3 feet
Calamagrostis X acutiflora, 4-6 feet
Centaurea montana, 2-3 feet
Centranthus ruber, 2-3 feet
Delphinium X elatum, 2 1/2-5 feet
Dendranthema grandiflora, 2-4 feet
Dicentra spectabilis, 2-3 feet
Dictamnus albus, 3 feet
Echinacea purpurea, 3-5 feet
Echinops ritro, 3-4 feet
Eupatorium coelestinum, 2 feet
Geum quellyon, 2-2 1/2 feet
Helenium autumnale, 3-5 feet
Helianthus X multiflorus, 3-5 feet
Heliopsis helianthoides, 3-4 feet
Hemerocallis, 1 1/2-4 feet
Hibiscus moscheutos, 5-8 feet
Iris hybrids, 2-3 feet
Iris sibirica, 2-4 feet
Liatris spp., 2-5 feet
Ligularia spp., 3-6 feet
Limonium latifolium, 2 feet
Linum perenne, 2 feet
Lobelia cardinalis, 2-3 feet
Lupinus hybrids, 3-4 feet
Lysimachia punctata, 3 feet
Miscanthus sinensis, 4-6 feet
Monarda didyma, 2 1/2-3 feet
Paeonia hybrids, 2-3 feet
Papaver orientale, 3-4 feet
Pennisetum alopecuroides, 3-6 feet
Phlox paniculata hybrids, 2-4 feet
Physostegia virginiana, 2-4 feet
Rodgersia spp., 3-4 feet
Rudbeckia fulgida, 2-3 feet
Sidalcea malvaeflora, 3 feet
Thalictrum spp., 3-6 feet
Yucca filamentosa, 4-6 feet

PERENNIALS FOR MOIST TO WET SITES

• indicates tolerant of clay or heavy soils
Aster novae-angliae •
Astilbe X arendsii •
Euphorbia epithymoides •
Heliopsis helianthoides •
Hibiscus moscheutos
Hosta •
Iris sibirica
Lobelia cardinalis
Mertensia virginica

Monarda didyma
Oenothera missouriensis •
Physostegia virginiana
Primula spp.
Rudbeckia fulgida •
Salvia spp. •
Saponaria ocymoides •
Thalictrum
Tradescantia X andersoniana
Trollius hybrids

PERENNIALS FOR SHADY SITES

• indicates drought tolerant
Astilbe X arendsii •
Bergenia cordifolia •
Brunnera macrophylla •
Convallaria majalis
Dicentra spp.
Geranium spp. •
Hemerocallis
Heuchera sanguinea
Hosta
Iris sibirica
Mertensia virginica •
Myosotis spp.
Polygonatum spp. •
Primula spp.
Thalictrum spp.
Trollius hybrids
Viola spp.

PERENNIALS FOR HOT, DRY SITES

Achillea spp.
Anthemis tinctoria
Arabis albida
Armeria maritima
Artemisia spp.
Asclepias tuberosa
Aurinia saxatilis
Baptisia australis
Centaurea montana
Coreopsis spp.
Dianthus deltoidea
Echinops ritro
Euphorbia epithymoides
Gaillardia X grandiflora
Gypsophila paniculata
Hemerocallis
Lavandula angustifolia
Liatris spp.
Lychnis chalcedonica
Oenothera missouriensis
Penstemon spp.
Rudbeckia fulgida
Salvia spp.
Saponaria ocymoides
Sedum spp.
Veronica spp.

PERENNIALS WITH SPECIAL FEATURES

NATIVE NORTH AMERICAN PERENNIALS

Achillea millefolium
Aquilegia canadensis
Artemisia ludoviciana
Aruncus dioicus
Asclepias tuberosa
Aster novae-angliae
Aster novi-belgii
Baptisia australis
Chelone spp.
Coreopsis spp.
Dicentra eximia
Echinacea purpurea
Erigeron speciosus
Geranium maculatum
Helenium autumnale
Heliopsis helianthoides
Hibiscus moscheutos
Liatris spp.
Lobelia cardinalis
Mertensia virginica
Monarda didyma
Oenothera tetragona
Oenothera missouriensis
Opuntia humifusa
Penstemon spp.
Phlox spp.
Polygonatum commutatum
Polygonatum biflorum
Potentilla tridentata
Rudbeckia spp.
Viola cucullata
Viola pubescens

PERENNIALS WITH FRAGRANT FLOWERS OR FOLIAGE

Artemisia spp.
Convallaria majalis
Dianthus X allwoodii
Echinacea purpurea
Hemerocallis
Hosta
Lavandula angustifolia
Monarda didyma
Paeonia lactiflora
Phlox paniculata hybrids
Salvia spp.
Thalictrum spp.
Thymus spp.
Viola spp.

PERENNIALS FOR CUT FLOWERS

• indicates also good for dried arrangements
Achillea spp. •
Anemone X hybrida
Anthemis tinctoria
Artemisia ludoviciana •
Aster spp.
Astilbe X arendsii •
Centaurea montana •
Convallaria majalis •
Coreopsis spp. •
Delphinium X elatum •
Dendranthema grandiflora
Dianthus spp.
Echinacea purpurea •
Echinops ritro •
Gypsophila paniculata •
Helianthus X multiflorus
Heliopsis helianthoides
Hemerocallis
Heuchera sanguinea •
Hosta
Iris
Leucanthemum X superbum
Liatris spp.
Lupinus hybrids
Lychnis chalcedonica •
Miscanthus sinensis •
Monarda didyma
Paeonia hybrids
Papaver orientale •
Pennisetum alopecuroides •
Penstemon spp.
Phlox paniculata hybrids
Physostegia virginiana
Pyrethrum roseum
Rudbeckia fulgida •
Salvia spp.
Sedum 'Autumn Joy' •
Trollius hybrids
Veronica spp.
Viola spp. •

PERENNIALS FOR NATURALIZING

Achillea millefolium
Ajuga spp.
Aquilegia spp.
Asclepias tuberosa
Baptisia australis
Cerastium tomentosum
Convallaria majalis
Coreopsis lanceolata
Dicentra spp.
Echinacea purpurea
Heliopsis helianthoides
Hemerocallis
Hosta
Liatris spp.
Lobelia cardinalis
Monarda didyma
Phlox subulata
Physostegia virginiana
Rudbeckia fulgida
Tradescantia X andersoniana
Veronica spp.
Viola spp.

LOW MAINTENANCE PERENNIALS

Achillea X 'Coronation Gold'
Asclepias tuberosa
Bergenia cordifolia
Brunnera macrophylla
Calamagrostis acutiflora
Campanula spp.
Coreopsis verticillata
Dicentra spectabilis
Echinacea purpurea
Echinops ritro
Heliopsis helianthoides
Hemerocallis spp.
Hosta spp.
Iris sibirica
Liatris spp.
Limonium latifolium
Paeonia hybrids
Papaver orientale
Platycodon grandiflorus
Sedum 'Autumn Joy'

ORNAMENTAL GRASSES

Calamagrostis acutiflora
Festuca cinerea
Miscanthus sinensis
Pennisetum alopecuroides

SELECTING PERENNIALS

Names

Each perennial has a single, specific botanical name that includes a genus, which is capitalized, followed by a species, which is written in lowercase letters. Perennials may have one or several different common names that differ from one region to another. Frequently, the genus is used as a common name, such as delphinium, hosta or iris. When many species within a single genus are being discussed, the abbreviation "spp." follows the genus.

To help you use the tables in this bulletin and order perennial stock, a cross-reference index is included at the back of this bulletin (p. 29) that lists common names followed by botanical names.

Colors

These include currently available flower colors. New cultivars are released every year that will add to this list. Many seed and nursery catalogs indicate the latest selections available. For plants grown primarily for foliage, the selection and care guide lists foliage color.

Height

The height of perennials varies considerably from species to species, and from one particular environment to the next. Also, many dwarf cultivars are available. Plants will often be taller in shade or in rich soil. The guide gives the common range for plants in flower. Foliage height may be much less.

Spread

It is necessary to allow sufficient room for perennials to develop properly. Spread tells you the mature spacing recommended between the center of one plant and the center of the next. For a complete look sooner, plant closer together and remove extra plants before crowding occurs.

Bloom Period

The time and duration of flowering for a given perennial is important to consider when designing a garden. Actual dates of bloom can vary up to 3 weeks from year to year, depending on the weather. Regional climatic conditions, location of the garden and proximity to large lakes can also influence this timing. The dates given are for the central part of the north central region (Detroit, Chicago, Dubuque). These dates will vary by at least 1 month earlier farther south or 1 month later in the northernmost

Light Level Guide

Level	Location	Amount of sun or shade
Sun	Open beds, south- or west-facing beds	No more than 3 hours of shade
Part shade	East-facing beds	At least 6 hours of full sun
Shade	North-facing beds, woodlands	Essentially no full sun

areas of the region. For plants grown for foliage, such as some ornamental grasses, this is the period of significant ornamental value.

Light

Most perennials prefer full sun to light shade. Some tolerate different light levels, and a few require either full sun or deep shade. The guide indicates the optimum light level or range of light levels for each plant. Three light levels are used: sun, part shade and shade.

Hardiness

The number listed in the table indicates the minimum hardiness zone (see hardiness zone map on page 32) recommended for growing a particular plant. It is based on the USDA map of climate zones. Average annual minimum air temperatures for Zone 3 are: -40°F to -30°F; Zone 4: -30°F to -20°F; Zone 5: -20°F to -10°F; Zone 6: -10°F to 0°F.

This system is only an approximate indication because it is based on minimum air temperatures and not on soil temperatures belowground where most perennials overwinter.

Hardiness can often be improved by planting in well drained soil and using a winter mulch.

Division/Propagation

The recommendations given are based on needs for rejuvenating plants and controlling size, not simply propagation. The best time of year to divide a particular plant is given, as well as an average of how frequently it should be divided. A blank in this column indicates that the specific plant does not need to be divided except for propagation. "No" indicates that the plant should not normally be divided.

Special Notes

This category includes miscellaneous care instructions, suggestions for use and special features, as well as undesirable characteristics. Plants that self-seed may be propagated by transplanting seedlings. However, the new plants may not be true to type.

PERENNIAL SELECTION AND CARE GUIDE

Botanical name (Common name)	Other common name(s)	Color	Flowering height (feet)	Mature spread and form (inches)	Bloom period	Light	Hardiness (zone)	Division (time of year; frequency in years)	Special notes (cultural uses, major pests, etc.)
<i>Achillea</i> X 'Coronation Gold' ('Coronation Gold' yarrow)	Fern-leaf yarrow	Yellow	2-4	36; mound	Mid-June- October	Sun	3-9	Spring; 3-4	Dead-head to prolong flowering. Aromatic foliage. Excellent dried flower.
<i>Achillea millefolium</i> and hybrids (Common yarrow)		Pink, white, red, yellow, salmon	1 1/2-3	24; spreading mound	Late June- September	Sun	3-9	Spring; 2-3	Can be invasive. Dead-head to prolong flowering. North American native.
<i>Aconitum</i> spp. (Monkshood)	Aconite Wolfsbane	Blue, yellow	3-5	12-24; mound	August- October	Sun to part shade	3-7	No	All parts of the plant are poisonous. Grows well in moist soil. Needs cool nights.
<i>Aegopodium podagraria</i> (Goutweed)	Bishop's weed	Green or variegated foliage	1	12; mound	May-June	Any	3-10	Any	Green form often invasive. Variegated form is not as invasive. Commonly used as a ground cover in areas where it can be kept from spreading.
<i>Ajuga</i> spp. (Bugleweed)	Carpet bugle	Blue, purple, white	1/2-1	9-24; spreading	April-June	Any	3-9	Any	Cultivars are available that have variegated or purple foliage. Commonly used as a ground cover. Can be invasive.
<i>Anemone</i> X <i>hybrida</i> , <i>A. vitifolia</i> , <i>A. hupehensis</i> (Windflower)	Japanese anemone	Pink, white	2-4	18-24; mound	August- October	Sun to part shade	4-8		Will not grow well in areas with dry summers or wet winters. Protect from wind; mulch in winter. Has attrac- tive seedheads. Syn. <i>A. japonica</i> .
<i>Anthemis tinctoria</i> (Golden Marguerite)	Yellow chamomile	Yellow, white	2	18-24; mound	June- September	Sun	3-7	Spring; 2	Prune back in late summer; self-seeds. Foliage is fragrant. Dead-head to prolong flowers.
<i>Aquilegia</i> spp. (Columbine)		All colors	1-3	12; mound	May-July	Sun to part shade	3-9	No	Is short-lived but self-seeds. Dead- head to prolong flowering. Subject to leaf miner. Grows best in moist soils. Some are North American natives.
<i>Arabis albida</i> (Rock cress)	Wall cress	Pink, white	1/2	12-18; spreading	April-June	Sun to part shade	4-7		Ground cover. Prune back to 3 inches after flowering. Needs good drainage.
<i>Armeria maritima</i> (Thrift)	Sea thrift Sea pink	Pink, red, white	1/2-1	6-12; spreading	May-June	Sun	4-8		Grows best in sandy soil. Clumps tend to rot in moist or heavy soils. Tolerates salt.
<i>Artemisia ludoviciana</i> (Silver king, silver queen)		Silver foliage	2-4	24; mound	Silver foliage May-October	Sun	4-9		Excellent dried flower. North American native.
<i>Artemisia schmidtiana</i> ('Silver Mound' artemisia)	Wormwood	Silver foliage	1-2	18; mound	Silver foliage May-October	Sun	3-7	Spring; 3	Grown only for its foliage, which is also fragrant. Soil must be well drained. Do not fertilize. Cut back each season.
<i>Aruncus dioicus</i> (Goat's-beard)		White	5	36-60; mound	June-July	Part shade to shade	2-7		Prefers moist soil. North American native.
<i>Asclepias tuberosa</i> (Butterfly weed)		Orange	2-3	12; mound	June-August	Sun	3-9	No	Tolerates poor, sandy, dry soil. Stems emerge slowly in spring. Attracts butterflies. Has attractive seed pods. North American native.
<i>Aster alpinus</i> (Alpine aster)		Purple, blue, pink	1/2-1	24; mound	May-June	Sun	4-7		Short-lived. Needs well drained soil.

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<i>Aster novae-angliae</i> , <i>Aster novi-belgii</i> (Hardy aster)	Michaelmas daisy New England aster	Blue, pink, purple, red, white	2-5	24-48; mound	September- October	Sun	4-8	Spring; 2	Grows best in rich, well drained soil. Pinch back in late spring. Aster yellows and powdery mildew are common problems. North American native.
<i>Astilbe X arendsii</i> (Astilbe)	False spirea	Pink, red, white	2-4	12-24; mound	June- August	Shade	4-9	Spring; 3	Grows best in deep, fertile soil high in organic matter. Protect from wind.
<i>Aubrieta deltoidea</i> (Purple rock cress)		Purple	1/2	18-24; spreading	April-June	Sun to part shade	4-8		Ground cover. Trim back halfway after flowering. Prefers well drained soil.
<i>Aurinia saxatilis</i> (Basket-of-gold)	Goldentuft alyssum	Yellow	1/2-1	12; trailing	May	Sun to part shade	3-7	No	Long-lived. Trailing habit. Syn. <i>Alyssum saxatile</i> .
<i>Baptisia australis</i> (False indigo)	Wild indigo	Blue	3-4	24-48; mound	May-June	Sun to part shade	3-9		Self-seeds. Pods are attractive. North American native.
<i>Belamcanda chinensis</i> (Blackberry lily)		Orange	3-4	12-24; upright	July- September	Sun	5-10	Spring; 2	Self-seeds. Iris borer can be a problem. Clusters of black seeds are attractive.
<i>Bergenia cordifolia</i> (Bergenia)		Pink, white, red	1-1 1/2	12; basal leaves	May	Part shade to shade	3-8	Spring; 4	Slugs can be a problem. Foliage often damaged by winter or spring frost or drought.
<i>Brunnera macrophylla</i> (Siberian forget-me-not)		Blue	1-1 1/2	12-18; spreading	April-June	Part shade to shade	3-7		Self-seeds and can be invasive. Tolerates dry soil and tree roots.
<i>Calamagrostis acutiflora</i> (Feather reed grass)		Golden seedheads	4-6	36; vertical	June-frost	Sun to part shade	4-9		Non-spreading ornamental grass. Very easy but very showy. Needs no staking.
<i>Campanula carpatica</i> (Carpathian harebell)	Bluebells	Blue, white	1	12; basal leaves	June- August	Sun	3-8		Needs good drainage.
<i>Campanula glomerata</i> (Clustered bellflower)	Bluebells	Blue, white, violet	1-2	12-18; mound	June- September	Sun to part shade	3-8		May need staking. Brilliant massed flowers.
<i>Centaurea macrocephala</i> (Golden century)		Yellow	3-4	24; upright	July	Sun	3-7		Basal leaves. Excellent cut flower.
<i>Centaurea montana</i> (Mountain bluet)		Blue, white, pink	2	12; mound	June- September	Sun	3-8	Spring; 2	Cut back after flowering.
<i>Centranthus ruber</i> (Red valerian)	Jupiter's-beard	Pink, white	2-3	24; mound	May-August	Sun to part shade	4-8	Spring; 3	Tolerates poor soil. Self-seeds easily.
<i>Cerastium tomentosum</i> (Snow-in-summer)		White	1/2	18-24; spreading	May-June	Sun	2-7	Spring; 2	Trim back after flowering. Silver foliage. Can be invasive. Dies back in hot weather.
<i>Cerastigma plumbaginoides</i> (Leadwort)		Blue	1/2-1	12-18; spreading	July- September	Sun to part shade	5-9	Spring; 3	Mulch in winter. Shoots emerge late.
<i>Chelone</i> spp. (Turtlehead)		Pink, white	2-3	12-24; mound	August- October	Sun to part shade	3-8		Tolerates moist soil. North American native.
<i>Chrysogonum virginianum</i> (Green-and-gold)	Goldenstar	Yellow	1/2-1	24; spreading	April- September	Any	5-9	Spring; 4	Ground cover. Prefers moist soil.
<i>Convallaria majalis</i> (Lily-of-the-valley)		White, pink	1/2-1	6; dense clump	May-June	Part shade to shade	2-7		Flowers are fragrant. Berries are poisonous. May be invasive.
<i>Coreopsis grandiflora</i> , <i>C. lanceolata</i> (Lance-leaf coreopsis)	Butter daisy Tickseed	Yellow	1 1/2-3	12; mound	June- October	Sun	3-9	Spring; 2-3	Dead-head to prolong bloom period. Powdery mildew can be a serious problem. North American native.
<i>Coreopsis verticillata</i> (Thread-leaf coreopsis)		Yellow	1 1/2-3	24; mound	July- October	Sun	3-9		Doesn't need dead- heading. North American native.

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<i>Dendranthema grandiflora</i> (Mum)	Hardy chrysanthemum	All colors except blue	1-4	12-36; mound or spreading	August- October	Sun	4-9	Spring; 2-3	Aphids, aster yellows, powdery mildew and rust are common problems. Heavy feeder; grows best in well drained soil with high organic matter. Plants can be moved in full bloom. Syn. <i>Chrysan- themum X morifolium</i> .
<i>Dianthus X allwoodii</i> (Cottage pinks)	Grass pink Pink Hardy carnation	Pink, red, salmon, white	1/2-1 1/2	12-15; basal	June- August	Sun	4-8	Spring; 3-4	Grows best in a fertile, well drained, slightly alkaline soil. Flowers are fragrant. Some will reseed. Prune lightly after flowers fade. Some are short-lived.
<i>Dianthus deltoides</i> (Maiden pink)	Pinks	Pink, red, white	1/2-1	24; mat	June	Sun	3-9		Needs good drainage.
<i>Dicentra eximia</i> (Fringed bleeding-heart)	Wild bleeding-heart	Pink, red, white	1-1 1/2	12; mound	May-July	Part shade	3-9		Grows best in a rich, well drained soil kept moist in the summer. Mulching is desirable. North American native.
<i>Dicentra spectabilis</i> (Bleeding-heart)		Pink, white	2	24; arching stems	May-June	Part shade to shade	2-9	Spring or late summer	Grows best in a rich, well drained soil kept moist in the summer with mulching. Goes dor- mant in summer.
<i>Dictamnus albus</i> (Gas plant)		Pink, white	3-4	24; vertical	May-June	Sun	3-8	No	Touching any part of the plant may result in dermatitis. Fragrant foliage. Slow growing. Syn. <i>D. fraxinella</i> .
<i>Doronicum caucasicum</i> (Leopard's-bane)		Yellow	1-1 1/2	12; mound	April-May	Sun to part shade	4-7		May go dormant in summer. Syn. <i>D. cordatum</i> .
<i>Echinacea purpurea</i> (Purple coneflower)		Pink, white	3-5	18-24; mound	July- September	Sun to part shade	3-8	Spring; 3-4	Grows best in well drained soil. Fragrant flowers. Excellent cut flower. North American native.
<i>Echinops ritro</i> (Globe thistle)		Blue	3-4	24; mound	July- October	Sun	3-8	Spring; 3-4	Tolerates dry soil. Attracts bees.
<i>Epimedium</i> spp. (Barrenwort)		Pink, white, yellow, red	1/2-1	12; spreading	May	Part shade to shade	3-8		Ground cover. Tolerates competition from tree roots.
<i>Erigeron speciosus</i> (Daisy fleabane)		Purple, pink	1 1/2- 2 1/2	12; mound	June- November	Sun	2-8	Spring; 2-3	Dead-head to prolong flowering. North American native.
<i>Eupatorium maculatum</i> , <i>E. purpureum</i> (Joe-pye weed)		Purple, white, pink	4-7	36; upright	September	Sun to part shade	2-8		Needs moist soil. Fragrant leaves. North American native.
<i>Eupatorium coelestinum</i> (Mist flower)	Hardy ageratum	Blue, white	2	12-24; mound	September- October	Any	5-9	Spring; 3	Stems emerge slowly in late spring; spreading.
<i>Euphorbia epithymoides</i> (Cushion spurge)		Chartreuse yellow	1-1 1/2	12-18; mound	April-May	Sun	4-8		Long-lived. Milky sap may irritate skin. Syn. <i>E. polychroma</i> .
<i>Festuca cinerea</i> (Blue fescue)		Silver-blue foliage	1 (foliage)	12; mound	April-October	Sun	4-10		Ornamental grass.
<i>Gaillardia X grandiflora</i> (Blanket flower)		Solid or bicolor red and yellow	1/2-3	24; mound	June- September	Sun	2-10	Spring; 1	Short-lived. Aster yellows and powdery mildew are prob- lems. Requires well drained soil.
<i>Galium odoratum</i> (Sweet woodruff)		White	1/2	12; spreading	May-June	Part shade to shade	4-8		Ground cover. Prefers moist soils. Has fragrant foliage. Syn. <i>Asperula odorata</i> .

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<i>Geranium</i> spp. (Hardy geranium)	Cranesbill	Blue, pink, purple, red, white	1/2-1 1/2	12-24; mound	April- August	Sun to part shade	3-8	Spring; 2-4	Tolerates alkaline soil. Prefers moist soil. Some are North American natives.
<i>Geum quellyon</i> (Avens)		Orange, red, yellow	2-2 1/2	12-18; basal leaves	May- September	Sun	5-7		Soil should be rich in organic matter and well drained. Short-lived. Mulch to overwinter.
<i>Goniolimon tartaricum</i> (German statice)		White	1 1/2	24; mound	July	Sun	4-9	No	Excellent dried flower.
<i>Gypsophila paniculata</i> (Baby's-breath)		Pink, white	2-3	24-36; mound	June-frost	Sun	3-9	No	Grows best in a well drained, alkaline soil (pH 6.8-7.5). Excellent cut or dried flower.
<i>Helenium autumnale</i> (Sneezeweed)		Orange, yellow	3-5	18; mound	August- October	Sun	3-8	Spring; 3	Tolerates wet soils. Do not fertilize. North American native.
<i>Helianthus X multiflorus</i> (Perennial sunflower)		Yellow	3-5	24; upright	August- October	Sun	4-8	Spring; 2	May require staking. Does not set seed.
<i>Heliopsis helianthoides</i> (Heliopsis)	Perennial sunflower Oxeye	Orange, yellow	3-4	24-48; upright mound	July- October	Sun	3-9	Spring; 2	Long-lived. North American native. Excellent cut or dried flower.
<i>Helleborus niger, H. orientalis</i> (Hellebore)	Christmas rose Lenten rose	Green, pink, white	1-1 1/2	12; mound	March-May	Part shade to shade	4-9		Grows best in rich soils that are consistently moist.
<i>Hemerocallis</i> spp. and cultivars (Daylily)		Orange, pink, red, yellow, lavender, cream	1 1/2-4	18-36; upright clump	June- September	Sun to part shade	3-9		Very easy to grow and trouble-free. Newer cultivars spread less and flower more.
<i>Heuchera sanguinea</i> (Coralbells)		Pink, red, white	1-2	12; arching stems	May-August	Part shade to shade	3-8	Spring; 3	Grows best in well drained, moist soil. Mulch to reduce heaving during winter.
<i>Hibiscus moscheutos</i> (Rose mallow)		Pink, red, white	5-8	24-30; mound	July-August	Sun	4-9		A large, shrubby, coarse-textured plant. Has very large flowers. North American native.
<i>Hosta</i> spp. and cultivars (Hosta)	Plantain lily Funkia	Purple, white	1-4	30-36; mound	June- September	Part shade to shade	3-9	Unneeded	Full sun may scorch leaves. Grows best in moist soil. Grown for variegated foliage—white, yellow, blue, green. Has fragrant flowers.
<i>Iberis sempervirens</i> (Candytuft)	Evergreen candytuft	White	1/2-1	12-18; mound	April-June	Sun to part shade	3-9	No	Leaves are evergreen. Self- seeds but may not be true to variety. Propagate by cuttings.
<i>Incarvillea delavayi</i> (Hardy gloxinia)		Pink	1-1 1/2	12-18; mound	April-June	Sun to part shade	5-7	Avoid	Mulch in winter. Slow to emerge.
<i>Iris kaempferi</i> (Japanese iris)		Blue, pink, purple, white	2-3	18-24; vertical	Late June- July	Sun to part shade	4-9	Late summer; 3	Iris borer is a com- mon pest. Needs moist, slightly acid soil. Cut back to 6 inches in fall.
<i>Iris hybrids</i> (Bearded iris)	German iris	All colors	1/2-3 1/2	12-15; upright	May-June	Sun	3-10	After blooming; 2-4	Susceptible to iris borer and soft rot. Cut back to 6 inches in fall. Some culti- vars rebloom in fall.
<i>Iris sibirica</i> (Siberian iris)		Blue, pink, white, yellow, purple	1 1/2-4	18-24; upright	May-June	Sun to part shade	3-9	Spring when necessary	Cut back to 6 inches in fall. Tolerates moist soil.
<i>Lamium galeobdolon</i> (Golden dead nettle)	Yellow archangel	Yellow	1/2-1 1/2	12-18; spreading	May- early June	Any	3-9	Spring; 2	Ground cover. Variegated foliage. Can become invasive.
<i>Lamium maculatum</i> (Spotted dead nettle)		Pink, white	1/2-1	12-18; spreading	May- early June	Part shade	3-8	Spring; 2	Ground cover. Variegated forms are available. Can become invasive.

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<i>Lavandula angustifolia</i> (Lavender)	English lavender True lavender	Purple, white	1-3	18; mound	June- September	Sun to part shade	5-9	No	Trim back in spring. Tips are often killed over winter. Fragrant.
<i>Leontopodium alpinum</i> (Edelweiss)		White, yellow	1/2-1	6-12; basal foliage	July-August	Sun	4-9		Silver foliage. Mulch to overwinter. Not especially showy. Short-lived. Easy from seed. Requires excellent drainage.
<i>Leucanthemum X superbum</i> (Shasta daisy)		White	1-4	12-24; mound	June- September	Sun to part shade	4-9	Spring; 2	Short-lived. Do not crowd. Self-seeds, but not true to variety. Dead-head to prolong flowering. Syn. <i>Chrysanthemum</i> <i>X superbum</i> ; <i>C.</i> <i>maximum</i> .
<i>Liatris spicata</i> (Blazing-star)	Prairie gay feather	Purple, white	2-5	12-24; vertical	July-early September	Sun to part shade	3-9		North American native. Excellent cut flower.
<i>Ligularia</i> spp. (Ligularia)	Groundsel Senecio	Yellow	3-5	36-48; upright	July-August	Part shade	3-7	Spring; 3	Prefers moist, rich soil and cool temperatures.
<i>Linum perenne</i> (Perennial flax)	Common blue flax	Blue	1-1 1/2	12; mound	May-August	Sun	4-9	No	Mulch to overwinter. Self-seeds. Requires good drainage.
<i>Limonium latifolium</i> (Sea lavender)	Perennial statice	Purple	2	18-24; basal foliage	July-August	Sun	3-9	No	Salt tolerant. Short- lived. Requires excellent drainage. Excellent dried flower.
<i>Liriope spicata</i> (Creeping lilyturf)		Purple, white	1-1 1/2	12; clump	July-August	Sun to part shade	5-8		Evergreen ground cover with black berries. Slugs can be a problem. Mulch in winter.
<i>Lobelia cardinalis</i> (Cardinal flower)	Indian pink	Red	2-4	12-18; vertical	July- September	Part shade	2-9		Grows best in moist, acid soil and is short-lived. A summer mulch is desirable. Will tolerate full sun in moist soil. North American native.
<i>Lupinus</i> hybrids (Lupine)		All colors	3-4	18-24; upright	May-June	Sun to part shade	3-6	No	Grows best in acid soils that are well drained and moist. Sensitive to hot summers. Short-lived but reseeds. Powdery mildew and rust are serious problems. Derived from North American species.
<i>Lychnis chalcedonica</i> (Maltese-cross)		Red	1 1/2-3	12; mound	June-early September	Sun	3-9		Tolerates wet soil.
<i>Lysimachia punctata</i> (Garden loosestrife)	Yellow loosestrife	Yellow	2-3	18; mound	June- September	Any	4-8	Spring; 3	Prefers a moist, organic soil. Good for naturalizing. Can become invasive.
<i>Mertensia virginica</i> (Virginia bluebells)		Blue	1/2-2	12; mound	April-May	Part shade to shade	3-9	No	Foliage dies down in July. North American native.
<i>Miscanthus sinensis</i> (Eulalia grass)	Maiden grass	Brown, white	3-7	24-48; vertical	Late September- November	Sun to part shade	4-10	Spring; 3	An ornamental grass. Some variegated forms. Plumes remain throughout winter.
<i>Monarda didyma</i> (Bee balm)	Wild bergamot Oswego tea	Pink, red, white, lavender	2 1/2-3	12-24; mound	June- August	Sun	4-9	Spring; 2	Grows best in moist soils. It has fragrant foliage and may become invasive. Powdery mildew and rust are common problems. North American native.
<i>Myosotis</i> spp. (Forget-me-not)		Blue	1/2	12; trailing	May-August	Part shade	3-8	Unneeded	Prefers moist soil. Short-lived. Allow to self-sow for continued presence in garden.

PERENNIAL SELECTION AND CARE GUIDE

Botanical name (Common name)	Other common name(s)	Color	Flowering height (feet)	Mature spread and form (inches)	Bloom period	Light	Hardiness (zone)	Division (time of year; frequency in years)	Special notes (cultural uses, major pests, etc.)
<i>Nepeta X faassenii</i> , <i>N. mussinii</i> (Catmint)		Blue	1-1 1/2	24; mound	May- September	Sun	3-8	Spring; 2	Fragrant foliage. Attracts bees.
<i>Oenothera tetragona</i> (Sundrop)		Yellow	1-3	12; mound	June- August	Sun	3-8		Short-lived but showy. North American native.
<i>Oenothera missouriensis</i> (Evening primrose)	Ozark sundrops	Yellow	3/4-1 1/2	12; spreading	June- September	Sun	3-8	Spring; 4	Stems emerge slowly in late spring. Good drainage in winter is important. North American native.
<i>Opuntia humifusa</i> (Prickly pear)		Yellow	1/2-1	24; spreading	June-July	Sun	4-10		A hardy cactus; tolerates poor soil. North American native, very prickly. Pods and fruits are edible.
<i>Paeonia</i> hybrids (Peony)	Chinese peony Herbaceous peony	Pink, red, white	2-3	24-36; mound	May-June	Sun	2-10		May require staking. Grows best in deep, fertile soil.
<i>Papaver orientale</i> (Oriental poppy)		Orange, pink, red, white	1 1/2-3	18-24; mound	June	Sun	2-7	No; after foliage dies down only if necessary.	Foliage dies down after flowering. Resents disturbance.
<i>Pennisetum alopecuroides</i> (Fountain grass)		Reddish brown	3-6	36; mound	August- early October	Sun	5-10		Mulch in colder areas. Slow to emerge. Good cut flower.
<i>Penstemon</i> spp. (Beard-tongue)		Orange, pink, purple, red, white	1/2-3	12-18; mound	June- August	Sun to part shade	3-7	Spring; 2	Short-lived. Mulch to overwinter. Requires well drained soil. North American native.
<i>Phlox maculata</i> (Phlox)	Spotted phlox	Pink, white	2-3	24; mound	June- August	Sun	3-9		North American native. Mildew resistant.
<i>Phlox paniculata</i> hybrids (Garden phlox)	Summer phlox	Blue, pink, purple, red, white	2-4	18; vertical	July- September	Sun to part shade	3-8		May need staking. Grows best in moist, well drained soil high in organic matter. A heavy feeder with fragrant flowers. Powdery mildew and rust are common problems. Derived from North American native.
<i>Phlox subulata</i> (Creeping phlox)	Moss phlox	Blue, pink, red, white	1/2	18-24; mat	April-June	Sun to part shade	2-9		Trim back after flowering. Evergreen ground cover in warmer zones.
<i>Physalis alkekengi</i> (Chinese-lantern plant)	Japanese-lantern	Orange seed pods	1 1/2	24; spreading	July-August	Sun	3-9	Spring; 1	Self-seeds. May become invasive.
<i>Physostegia virginiana</i> (Obedient plant)	Obedience False dragonhead	Pink, white	2-4	24; mound	July- October	Sun to part shade	2-9	Spring; 2	May become invasive. North American native.
<i>Platycodon grandiflorus</i> (Balloon flower)		Blue, pink, white	1 1/2-4	12-24; upright	July- September	Sun to part shade	3-8	No	Long-lived. May require staking. Emerges late in spring. Prefers acid soil.
<i>Polemonium caeruleum</i> (Jacob's-ladder)	Greek valerian	Blue	1 1/2-2	9-18; mound	May-August	Any	2-7		Prefers moist soil. Remove dead flowers to promote flowering.
<i>Polygonatum</i> spp. (Solomon's-seal)	King Solomon's- seal	White	1-4	12-36; arching stems	May-June	Shade	3-9		Long-lived. Variegated types are available. Some species are native to North America.
<i>Polygonum affine</i> (Smartweed)	Fleece flower	Pink, red	1/2-1	12; spreading	May- October	Sun to part shade	3-7	Spring; 2	Ground cover. Can be invasive.
<i>Potentilla</i> spp. (Cinquefoil)	Five-fingers	Pink, red, yellow, white	1/2-2	12-24; trailing	May-August	Sun- part shade	3-8		Many are evergreen ground covers in zones 5 or warmer. Some are North American natives.
<i>Primula</i> spp. (Primrose)		All colors	1/2-1	6-12; basal foliage	April-June	Varies	2-8	Spring; 2	Delicate flowers. Usually prefers a moist soil high in organic matter. Good rock garden plants.

PERENNIAL SELECTION AND CARE GUIDE

Botanical name (Common name)	Other common name(s)	Color	Flowering height (feet)	Mature spread and form (inches)	Bloom period	Light	Hardiness (zone)	Division (time of year; frequency in years)	Special notes (cultural uses, major pests, etc.)
<i>Prunella X webbiana</i> (Self-heal)		Pink, red, white	1/2-1	12; spreading	June-July	Sun to part shade	3-8		Ground cover. Related to <i>Prunella vulgaris</i> , a lawn weed.
<i>Pulmonaria saccharata</i> (Lungwort)	Bethlehem sage	Blue, pink	1-1 1/2	12-24; spreading	April-June	Part shade to shade	3-8		Variegated leaves. May go dormant in summer.
<i>Pyrethrum roseum</i> (Pyrethrum)	Painted daisy	Pink, red, white	1-3	12; mound	June-July	Sun to part shade	3-7	Spring or fall; 2	Short-lived. Needs support. Cut back to a few inches after flowering. A winter mulch should be used to reduce heaving. Syn. <i>Chrysanthemum coccineum</i> .
<i>Rodgersia</i> spp. (Rodgersia)		Pink, red, white	3-6	48-64; mound	June- August	Part shade to shade	4-7		Coarse, attractive foliage. Prefers moist soil. Very large accent plant.
<i>Rudbeckia fulgida</i> 'Goldsturm' (Black-eyed Susan)	Orange coneflower	Yellow with black centers	2-3	24; mound	July- September	Sun	3-9	Spring; 3	Self-seeds, but seedlings aren't true to type. One of the best perennials available. North American native.
<i>Salvia</i> spp. (Perennial salvia)	Sage	Blue, purple, white	1-3	12-24; mound	June- September	Sun	3-9		Easy to grow. Tolerates dry soil.
<i>Saponaria ocymoides</i> (Soapwort)		Pink, white	1/2-1	1; spreading	June- September	Sun	2-7		Cut back after flowering. Requires good drainage.
<i>Scabiosa caucasica</i> (Pincushion flower)	Scabious	Blue, purple, white	1-1 1/2	12; mound	June- September	Sun	3-7	3-4	Resents wet soil. Slow growing.
<i>Sedum X 'Autumn Joy'</i> ('Autumn Joy' sedum)		Pink to red	1-2	12-18; mound	August- October	Sun to part shade	3-10		A succulent. Flowers attract bees. Long- lived.
<i>Sedum</i> spp. (Stonecrop)		Pink, red, white, yellow	1/4-1 1/2	6-18; spreading	June- September	Sun	3-8		Succulent ground cover. Red foliage types are available.
<i>Sempervivum</i> spp. (Hen-and-chickens)	Houseleek Liveforever	Purple, white	1/2	9; mat	July-August	Sun	3-8		A succulent. Leaves are in a basal rosette. Grown primarily for its foliage.
<i>Sidalcea malvaeflora</i> (Checkerbloom)	Checker-mallow	Pink, white	3	12-24; mound	June- August	Sun	4-7	Spring; 3-4	Short-lived. Dislikes heat.
<i>Stokesia laevis</i> (Stokes' aster)	Cornflower aster	Blue, white	1-1 1/2	12-18; mound	July- September	Sun to part shade	5-9		Mulch to overwinter. Resents wet soil.
<i>Thalictrum</i> spp. (Meadow rue)		Lavender, yellow, white	3-5	24-36; mound	June- August	Sun to part shade	3-7		Long-lived. Used best as background plants. Prefers moist soil.
<i>Thymus</i> spp. (Thyme)		Pink, white, blue	1/4-1	12; spreading	June- August	Sun	4-10		Ground cover. Fragrant, sometimes variegated foliage. Edible herb.
<i>Tradescantia X andersoniana</i> (Spiderwort)		Blue, pink, purple, white	1 1/2-3	15-30; mound	June- August	Any	4-9	Spring; 2	May become invasive. Cut back to ground in fall. North American native.
<i>Trollius</i> hybrids (Globeflower)		Yellow, orange	2	24-36; mound	June	Sun to part shade	4-6	Avoid	Grows best in rich, moist soils. Cut back foliage in late summer.
<i>Veronica</i> spp. (Speedwell)		Blue, pink, purple, white	1/2-4	12-18; mound or spreading	June- August	Sun to part shade	3-8	Spring; 4	Tolerates wet soils. Intense blue flowers.
<i>Viola</i> spp. (Violet)	Sweet violet Garden violet	Blue, purple, red, white, yellow	1/2-1	12; mound	April-June	Part shade to shade	4-9	Spring; 3	Grows best in moist soils high in organic matter. Flowers are fragrant. Some species are North American natives.
<i>Yucca filamentosa</i> (Adam's-needle)		White	3-5	24; vertical	July-August	Sun	4-10		Propagated by offsets from crown. Drought tolerant. Needs good drainage.

BLOOM CHART

E = Early
M = Middle
L = Late

* Times are approximate for the middle of USDA Zone 5.

	February	March	April	May	June	July	August	September	October
Perennial	E M L	E M L	E M L	E M L	E M L	E M L	E M L	E M L	E M L
<i>Ajuga</i> spp.			X X X	X X X					
<i>Arabis albida</i>		X	X X X	X X X					
<i>Aubrieta deltoidea</i>			X X X	X X X	X X X				
<i>Bergenia cordifolia</i>			X X X	X X X					
<i>Brunnera macrophylla</i>			X X X	X X X	X X X				
<i>Ceratostigma plumbaginoides</i>			X X X	X X X					
<i>Chrysogonum virginianum</i>			X X X	X X X	X X X	X X X	X X X	X X X	
<i>Doronicum caucasicum</i>			X X X	X X X					
<i>Euphorbia epithymoides</i>			X X X	X X X					
<i>Festuca cinerea</i>			X X X	X X X	X X X	X X X	X X X	X X X	X X X
<i>Geranium</i> spp.			X X X	X X X	X X X	X X X	X X X		
<i>Helleborus niger, H. orientalis</i>	X X X	X X X	X X X						
<i>Iberis sempervirens</i>			X X X	X X X					
<i>Incarvillea delavayi</i>			X X X	X X X	X X X				
<i>Mertensia virginica</i>			X X X	X X X					
<i>Phlox subulata</i>			X X X	X X X					
<i>Primula</i> spp.			X X X	X X X					
<i>Viola</i> spp.			X X X	X X X					
<i>Aegopodium podagraria</i>				X X X	X X X				
<i>Aquilegia</i> spp.				X X X	X X X	X X X			
<i>Armeria maritima</i>				X X X	X X X				
<i>Aurinia saxatilis</i>				X X X					
<i>Baptisia australis</i>				X X					
<i>Centranthus ruber</i>				X X X	X X X	X X X	X X X		
<i>Cerastium tomentosum</i>				X X X	X X X				
<i>Convallaria majalis</i>				X X X	X X X				
<i>Dianthus X allwoodii</i>				X X X	X X X	X X X	X X X	X X	
<i>Dicentra eximia</i>				X X X	X X X	X X X	X X X	X X X	
<i>Dicentra spectabilis</i>				X X X	X X X				
<i>Dictamnus albus</i>				X X X	X X X				
<i>Epimedium</i> spp.				X X X					
<i>Galium odoratum</i>				X X X	X X X				
<i>Geum quellyon</i>				X X X	X X X	X X X	X X X	X X X	X X X
<i>Heuchera sanguinea</i>				X X X	X X X	X X X	X X X		
<i>Iris</i> hybrids			X	X X X	X X			X X	X X
<i>Iris sibirica</i>				X X X	X X X				
<i>Lamium maculatum</i>				X X X					
<i>Lupinus</i> hybrids				X X X	X X X				
<i>Myosotis</i> spp.				X X X	X X X	X X X			
<i>Nepeta X faassenii, N. mussinii</i>				X X X	X X X	X X X	X X X	X X X	X X X
<i>Paeonia</i> hybrids				X X X	X X X	X X X			
<i>Polemonium caeruleum</i>				X X X	X X X				
<i>Polygonatum</i> spp.				X X X	X X X				
<i>Polygonum affine</i>				X X X	X X X	X X X	X X X	X X	X X X
<i>Potentilla</i> spp.				X X X	X X X	X X X			
<i>Trollius</i> hybrids				X X X	X X X				
<i>Achillea millefolium</i> and hybrids					X	X X X	X X X	X X X	
<i>Achillea</i> X 'Coronation Gold'					X X X	X X X	X X X	X X X	X X
<i>Anthemis tinctoria</i>					X X X	X X X	X X X	X X X	X X X
<i>Artemisia schmidtiana</i>					X X X	X X X	X X X	X X X	
<i>Aruncus dioicus</i>					X X X	X X X	X X X		
<i>Asclepias tuberosa</i>					X X X	X X X	X X X		
<i>Astilbe</i> X <i>arendsii</i>					X X X	X X X	X X X		
<i>Calamagrostis acutiflora</i>					X X X	X X X	X X X	X X X	
<i>Campanula glomerata</i>					X X X	X X X	X X X	X X X	
<i>Centaurea montana</i>					X X X	X X X	X X X	X X X	
<i>Coreopsis grandiflora, C. lanceolata</i>					X X X	X X X	X X X	X X X	X X X
<i>Delphinium</i> X <i>elatum</i>					X X X	X X X	X X X	X X X	X X X
<i>Erigeron speciosus</i>					X X X	X X X	X X X	X X X	X X X

BLOOM CHART

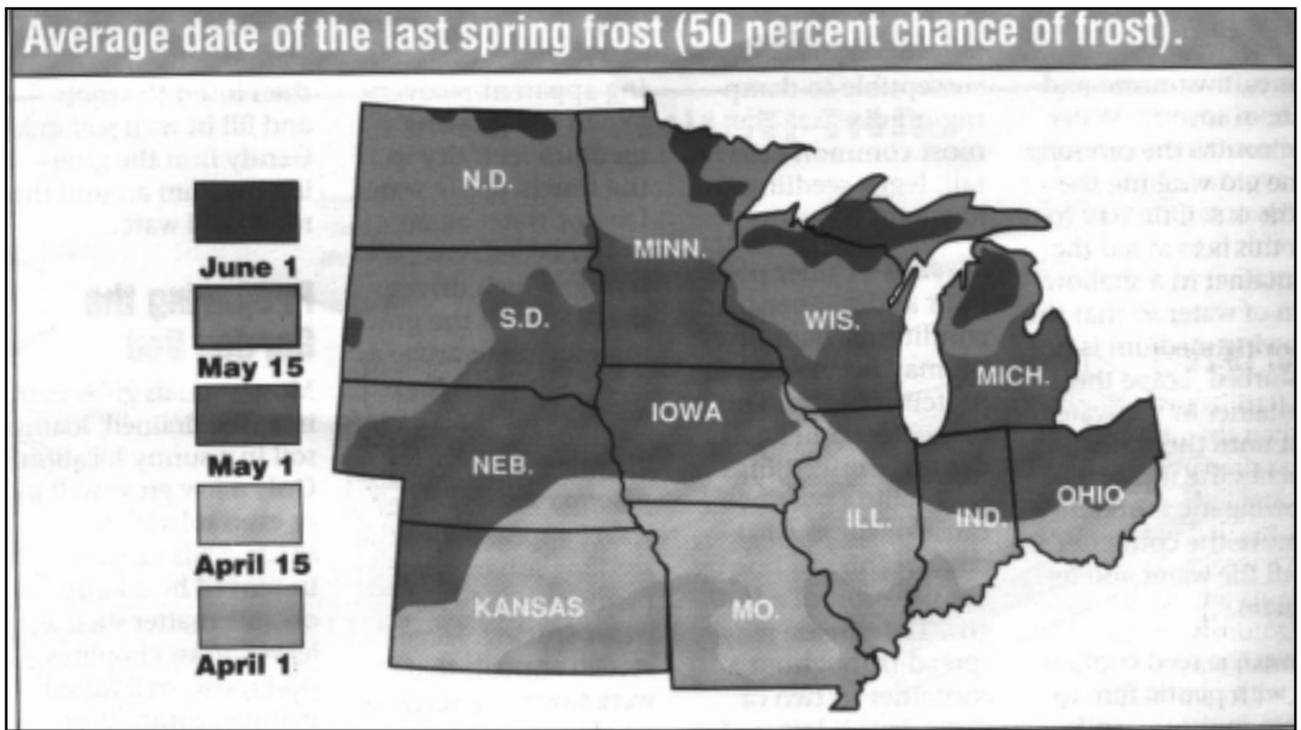
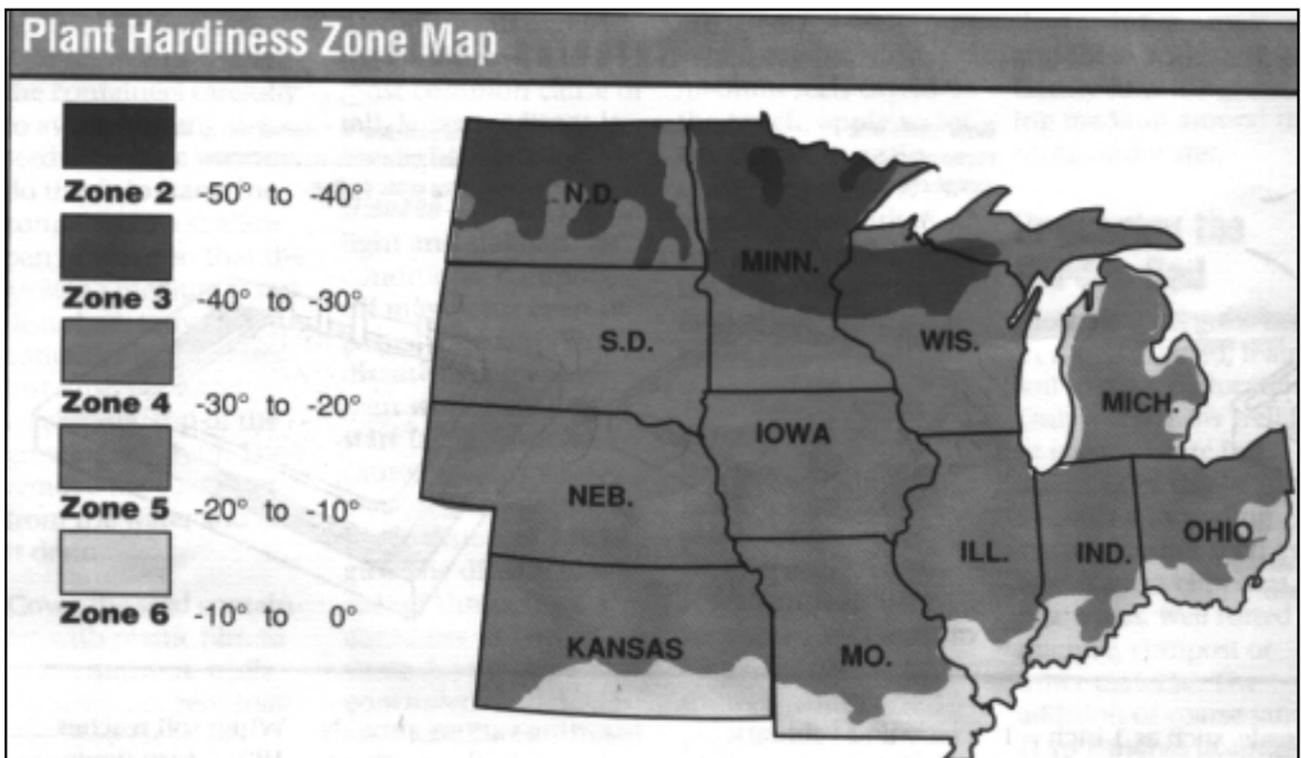
	February	March	April	May	June	July	August	September	October
Perennial	E M L	E M L	E M L	E M L	E M L	E M L	E M L	E M L	E M L
<i>Festuca cinerea</i>					X	X X X			
<i>Gaillardia X grandiflora</i>					X X X	X X X	X X X	X X X	X X X
<i>Gypsophila paniculata</i>					X X X	X X X	X X X	X X X	
<i>Hemerocallis</i> spp. and cultivars					X X X	X X X	X X X		
<i>Iris kaempferi</i>					X	X X X			
<i>Lavandula angustifolia</i>					X X X	X X X	X X X	X X X	
<i>Leucanthemum X superbum</i>					X X X	X X X	X X X	X X X	
<i>Linum perenne</i>					X X X	X X X	X X X		
<i>Lychnis chalcedonica</i>					X X X	X X X	X X X	X	
<i>Monarda didyma</i>					X	X X X			
<i>Oenothera missouriensis</i>					X X X	X X X	X X X	X X X	
<i>Opuntia humifusa</i>					X X X				
<i>Papaver orientale</i>					X X X	X X X			
<i>Penstemon</i> spp.					X X X	X X X	X X X		
<i>Prunella X webbiana</i>					X X X	X X X			
<i>Pyrethrum roseum</i>					X X X				
<i>Salvia</i> spp.					X X X	X X X	X X X	X X X	X X X
<i>Saponaria ocymoides</i>					X X X	X X X	X X X	X X X	
<i>Scabiosa caucasica</i>					X X X	X X X	X X X	X X X	
<i>Sidalcea malvaeflora</i>					X X X	X X X			
<i>Thymus</i> spp.					X X X	X X X			
<i>Tradescantia X andersoniana</i>					X X X	X X X	X X X		
<i>Veronica</i> spp.					X X X	X X X	X X X		
<i>Belamcanda chinensis</i>						X X X	X X X	X X X	
<i>Cerastigma plumbaginoides</i>						X X X	X X X	X X X	
<i>Echinacea purpurea</i>						X X X	X X X	X X X	
<i>Echinops ritro</i>						X X X	X X X	X X X	X X X
<i>Heliopsis helianthoides</i>						X X X	X X X	X X X	X X X
<i>Hibiscus moscheutos</i>						X X X	X X X		
<i>Leontopodium alpinum</i>						X X X	X X X		
<i>Liatris spicata</i>						X X X	X X X	X	
<i>Limonium latifolium</i>						X X X	X X X		
<i>Ligularia</i> spp.						X X X	X X X		
<i>Liriope spicata</i>						X X X	X X X		
<i>Lobelia cardinalis</i>						X X X	X X X	X X X	X X X
<i>Lysimachia punctata</i>						X X X	X X X		
<i>Phlox paniculata</i>						X X X	X X X	X X X	
<i>Physalis alkekengi</i>						X X X	X X X		
<i>Physostegia virginiana</i>						X X X	X X X	X X X	
<i>Platycodon grandiflorus</i>						X X X	X X X	X X X	X X X
<i>Rodgersia</i> spp.						X X X	X X X		
<i>Rudbeckia fulgida</i> 'Goldsturm'						X X X	X X X	X X X	
<i>Sempervivum</i> spp.						X X X	X X X		
<i>Stokesia laevis</i>						X X X	X X X	X X X	
<i>Thalictrum</i> spp.						X X X	X X X		
<i>Yucca filamentosa</i>						X X X	X X X		
<i>Aconitum</i> spp.							X X X	X X X	X X X
<i>Anemone X hybrida</i> , <i>A. vitifolia</i> , <i>A. hupehensis</i>							X X X	X X X	X X X
<i>Dendranthema grandiflora</i>							X X X	X X X	X X X
<i>Helenium autumnale</i>							X X X	X X X	
<i>Helianthus X multiflorus</i>							X X X	X X X	
<i>Hosta</i> spp.							X X	X X X	
<i>Pennisetum alopecuroides</i>							X X X	X X X	X
<i>Sedum X 'Autumn Joy'</i>							X X X	X X X	X X X
<i>Aster novae-angliae</i>								X	X X X
<i>Eupatorium coelestinum</i>								X X X	X X X
<i>Miscanthus sinensis</i>								X	X X X

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 Fleece flower/*Polygonum affine*
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 Golden Marguerite/*Anthemis tinctoria*
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 Hardy chrysanthemum/*Dendranthema grandiflora*
 Hardy geranium/*Geranium*
 Hardy gloxinia/*Incarvillea delavayi*
 Harebell/*Campanula*
 Heliopsis/*Heliopsis helianthoides*
 Hellebore/*Helleborus*
 Hen-and-chickens/*Sempervivum*
 Herbaceous peony/*Paeonia* hybrids
 Hosta/*Hosta*
 Houseleek/*Sempervivum*
 Indian pink/*Lobelia cardinalis*
 Jacob's-ladder/*Polemonium caeruleum*
 Japanese anemone/*Anemone*
 Japanese iris/*Iris kaempferi*
 Japanese-lantern/*Physalis alkekengi*
 Joe-pye weed/*Eupatorium maculatum*, *E. purpureum*
 Jupiter's-beard/*Centranthus ruber*
 King Solomon's-seal/*Polygonatum*
 Lance-leaf coreopsis/*Coreopsis*
 Lavender/*Lavandula angustifolia*
 Leadwort/*Ceratostigma plumbaginoides*
 Lenten rose/*Helleborus*
 Leopard's-bane/*Doronicum caucasicum*
 Lily-of-the-valley/*Convallaria majalis*
 Liveforever/*Sempervivum*
 Lungwort/*Pulmonaria saccharata*
 Lupine/*Lupinus* hybrids
 Maiden grass/*Miscanthus sinensis*
 Maiden pink/*Dianthus deltoides*
 Maltese-cross/*Lychnis chalcidonica*
 Meadow rue/*Thalictrum*
 Michaelmas daisy/*Aster*
 Mist flower/*Eupatorium coelestinum*
 Monkshood/*Aconitum*
 Moss phlox/*Phlox subulata*
 Mountain bluet/*Centaurea montana*
 Mum/*Dendranthema grandiflora*
 New England aster/*Aster*
 Obedience/*Physostegia virginiana*
 Obedient plant/*Physostegia virginiana*
 Orange coneflower/*Rudbeckia fulgida* 'Goldsturm'
 Oriental poppy/*Papaver orientale*
 Oswego tea/*Monarda didyma*
 Oxeye/*Heliopsis helianthoides*
 Ozark sundrops/*Oenothera missouriensis*
 Painted daisy/*Pyrethrum roseum*
 Peony/*Paeonia* hybrids
 Perennial flax/*Linum perenne*
 Perennial larkspur/*Delphinium*
 Perennial salvia/*Salvia*
 Perennial statice/*Limonium latifolium*
 Perennial sunflower/*Helianthus* X *multiflorus*, *Heliopsis helianthoides*

CROSS-REFERENCE INDEX

Phlox/ <i>Phlox maculata</i>	'Silver Mound' artemisia/ <i>Artemisia schmidtiana</i>	Wall cress/ <i>Arabis albida</i>
Pincushion flower/ <i>Scabiosa caucasica</i>	Silver queen/ <i>Artemisia ludoviciana</i>	Wild bergamot/ <i>Monarda didyma</i>
Pink/ <i>Dianthus</i>	Smartweed/ <i>Polygonum affine</i>	Wild bleeding-heart/ <i>Dicentra eximia</i>
Plantain lily/ <i>Hosta</i>	Sneezeweed/ <i>Helenium autumnale</i>	Wild indigo/ <i>Baptisia australis</i>
Prairie gay-feather/ <i>Liatris spicata</i>	Snow-in-summer/ <i>Cerastium tomentosum</i>	Windflower/ <i>Anemone X hybrida</i>
Prickly pear/ <i>Opuntia humifusa</i>	Soapwort/ <i>Saponaria ocymoides</i>	Wolfsbane/ <i>Aconitum</i>
Primrose/ <i>Primula</i>	Solomon's-seal/ <i>Polygonatum</i>	Wormwood/ <i>Artemisia schmidtiana</i>
Purple coneflower/ <i>Echinacea purpurea</i>	Speedwell/ <i>Veronica</i>	Yarrow/ <i>Achillea millefolium</i>
Purple rock cress/ <i>Aubrieta deltoidea</i>	Spiderwort/ <i>Tradescantia X andersoniana</i>	Yellow archangel/ <i>Lamium galeobdolon</i>
Pyrethrum/ <i>Pyrethrum roseum</i>	Spotted dead nettle/ <i>Lamium maculatum</i>	Yellow chamomile/ <i>Anthemis tinctoria</i>
Red valerian/ <i>Centranthus ruber</i>	Spotted phlox/ <i>Phlox maculata</i>	Yellow loosestrife/ <i>Lysimachia punctata</i>
Rock cress/ <i>Arabis albida</i>	Stokes' aster/ <i>Stokesia laevis</i>	
Rodgersia/ <i>Rodgersia</i>	Stonecrop/ <i>Sedum</i>	
Rose mallow/ <i>Hibiscus moscheutos</i>	Summer phlox/ <i>Phlox paniculata</i> hybrids	
Sage/ <i>Salvia</i>	Sundrops/ <i>Oenothera</i>	
Scabious/ <i>Scabiosa caucasica</i>	Sweet violet/ <i>Viola</i>	
Sea lavender/ <i>Limonium latifolium</i>	Sweet woodruff/ <i>Galium odoratum</i>	
Sea pink/ <i>Armeria maritima</i>	Thread-leaf coreopsis/ <i>Coreopsis verticillata</i>	
Sea thrift/ <i>Armeria maritima</i>	Thrift/ <i>Armeria maritima</i>	
Self-heal/ <i>Prunella X webbiana</i>	Thyme/ <i>Thymus</i>	
Senecio/ <i>Ligularia</i>	Tickseed/ <i>Coreopsis</i> spp.	
Shasta daisy/ <i>Leucanthemum X superbum</i>	True lavender/ <i>Lavandula angustifolia</i>	
Siberian forget-me-not/ <i>Brunnera macrophylla</i>	Turtlehead/ <i>Chelone</i>	
Siberian iris/ <i>Iris sibirica</i>	Violet/ <i>Viola</i>	
Silver king/ <i>Artemisia ludoviciana</i>	Virginia bluebells/ <i>Mertensia virginica</i>	



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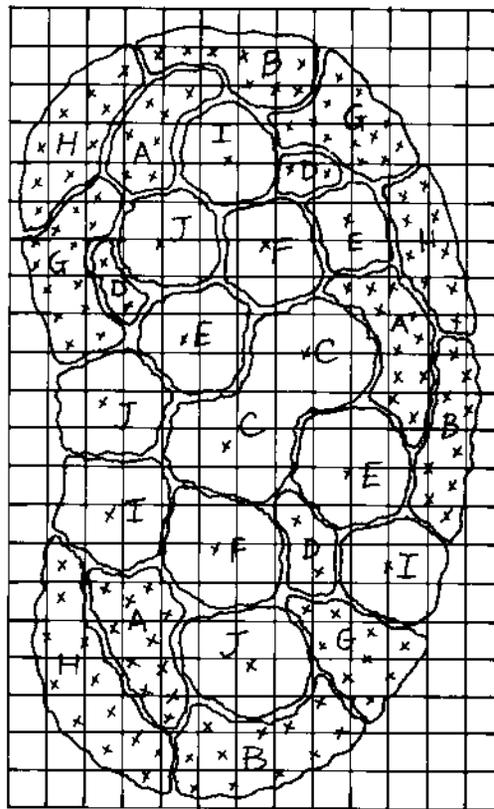
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CORRECTION SHEET

Growing Perennials

The flowers listed in the illustration at the top of page 9 in NCR 556, "Growing Perennials" are ANNUALS. Following is the correct version for PERENNIALS. We are sorry for any difficulties this has caused.

This bed is designed to provide continuous bloom throughout the growing season.



- A. Arabis caucosica
- B. Phlox subulata 'Emerald Pink'
- C. Hemerocallis 'Hyperion'
- D. Geum x borisii
- E. Trollius europaeus 'Superbus'
- F. Lavandula angustifolia
- G. Campanula carpatica
- H. Oenothera missouriensis
- I. Rudbeckia fulgida 'Goldsturm'
- J. Sedum x 'Autumn Joy'

'x' represents placement of individual plant



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