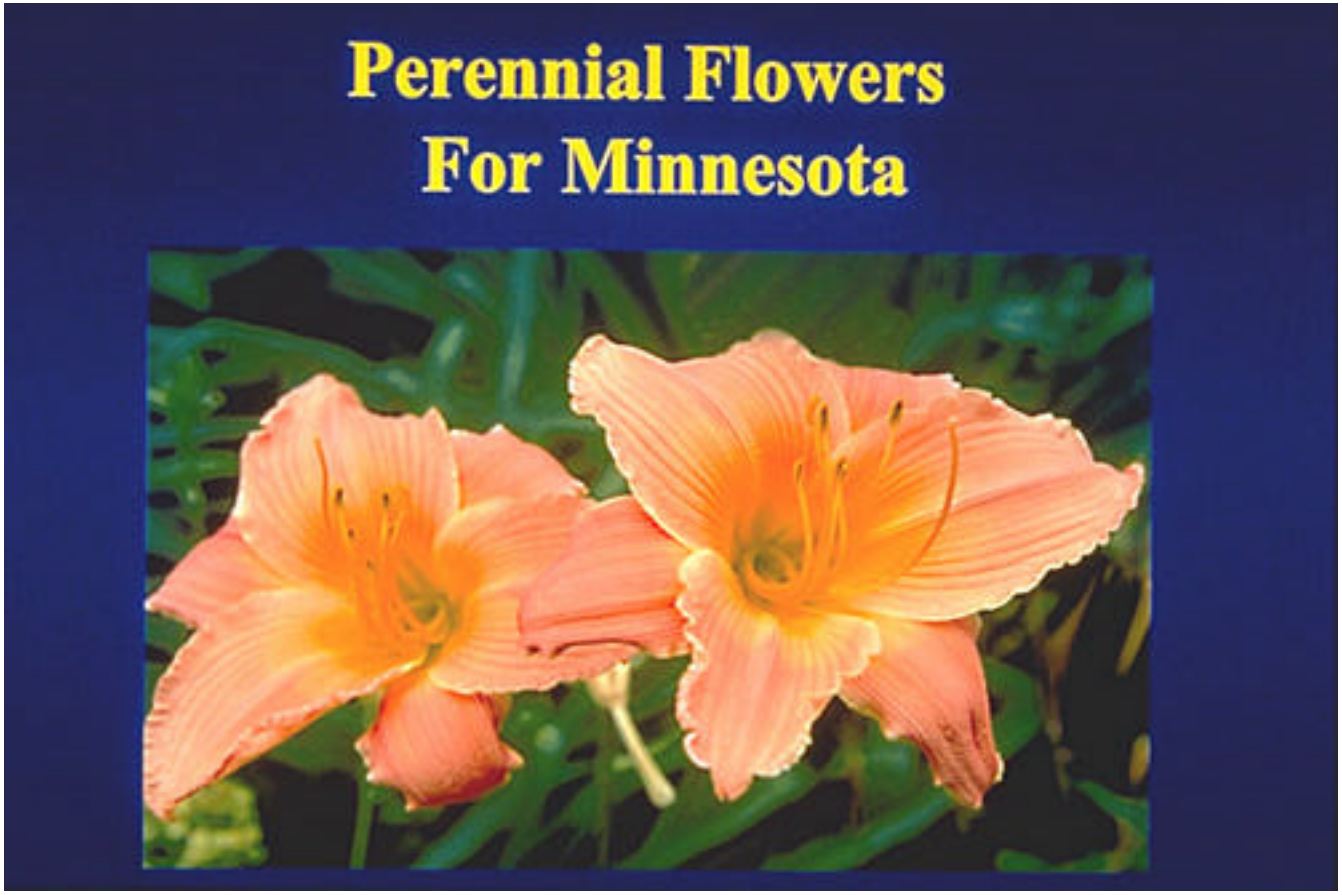
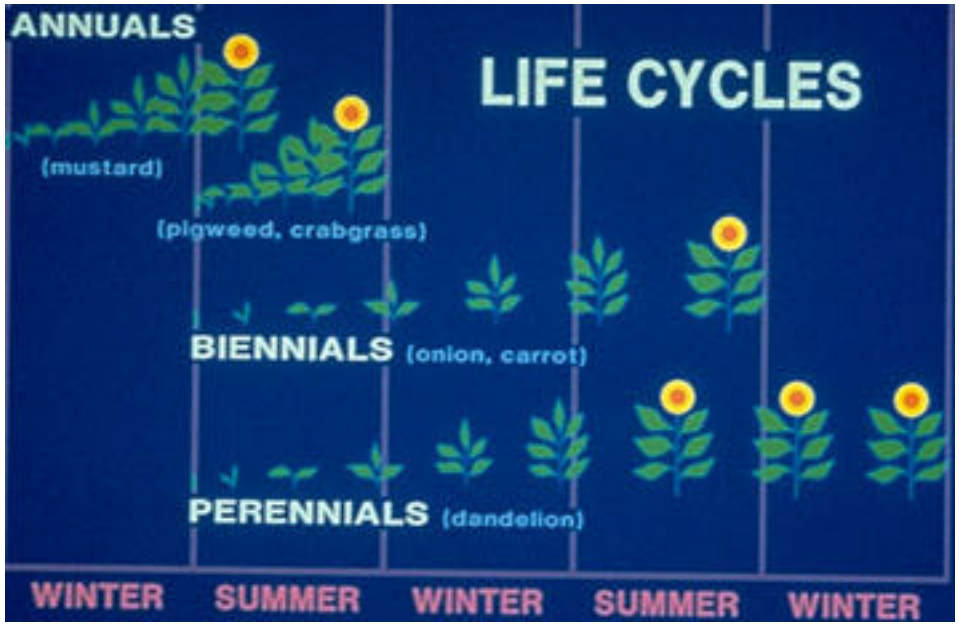


Herbaceous Perennials for Minnesota. Herbaceous perennials are non-woody plants that die back to the ground each year. This slide set will cover selection, care and diagnosing common perennial problems. Approximately 35 perennials will be covered that are good selections for Minnesota.

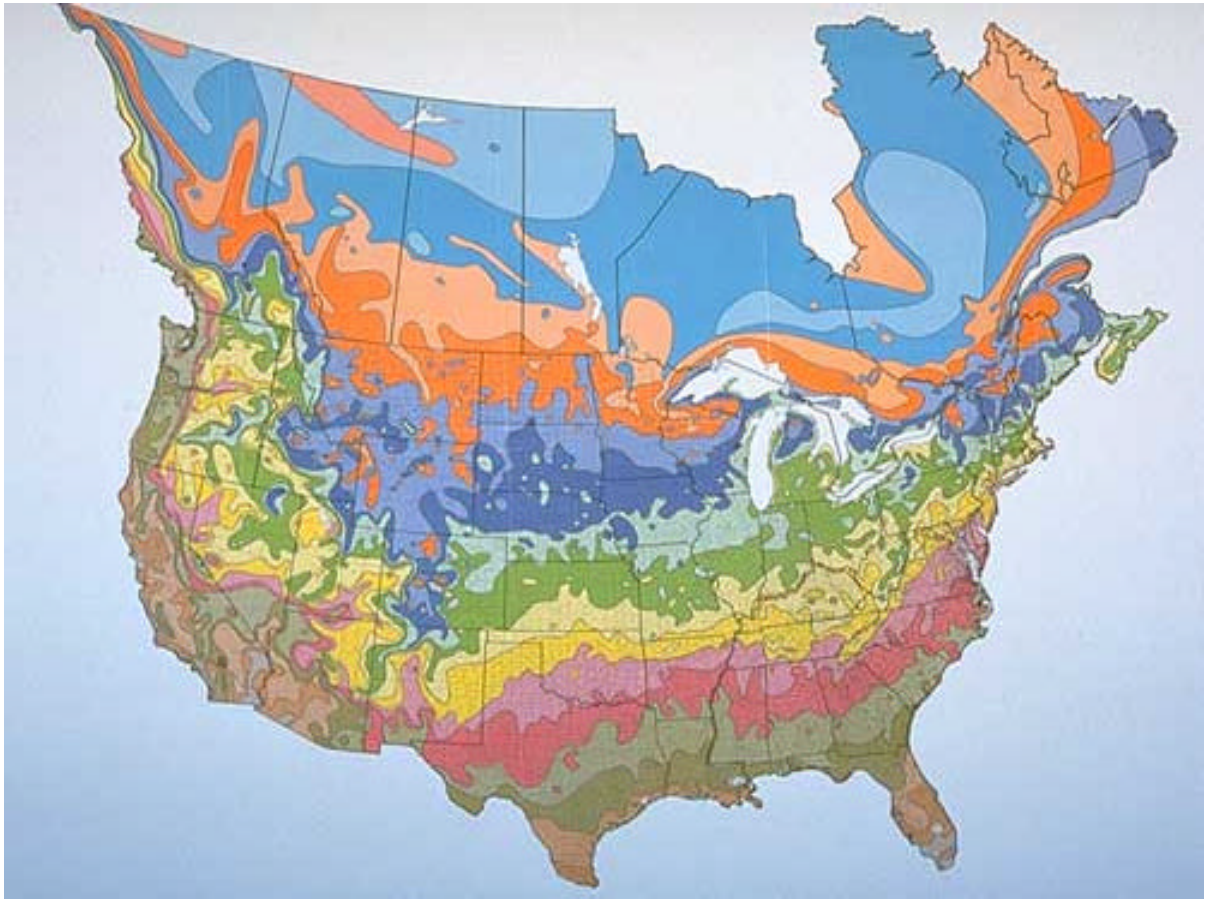


This chart shows the difference between annuals, biennials and perennials. Perennials are plants that live for more that 2 years, some out live their owners, and others only live a few years. All perennials will flower for a portion of the growing season and then store food to assure growth the following year. In some plants, such as lilies or tulips, this storage of food takes place in bulbs; in others, such as hosta or daylilies, they develop large roots. Without this time of food storage, perennials would not be able to continue grow each year. Annuals differ by putting all their energy into flowers and store no food for the following year. This is why annuals flower for a long period of time, usually all summer, and perennials flower only a short time. Perennials must store food to enable them to grow again the following year. Flowering takes energy and depletes food storage. Long flowering perennials may tend to be shorter-lived plants in general.

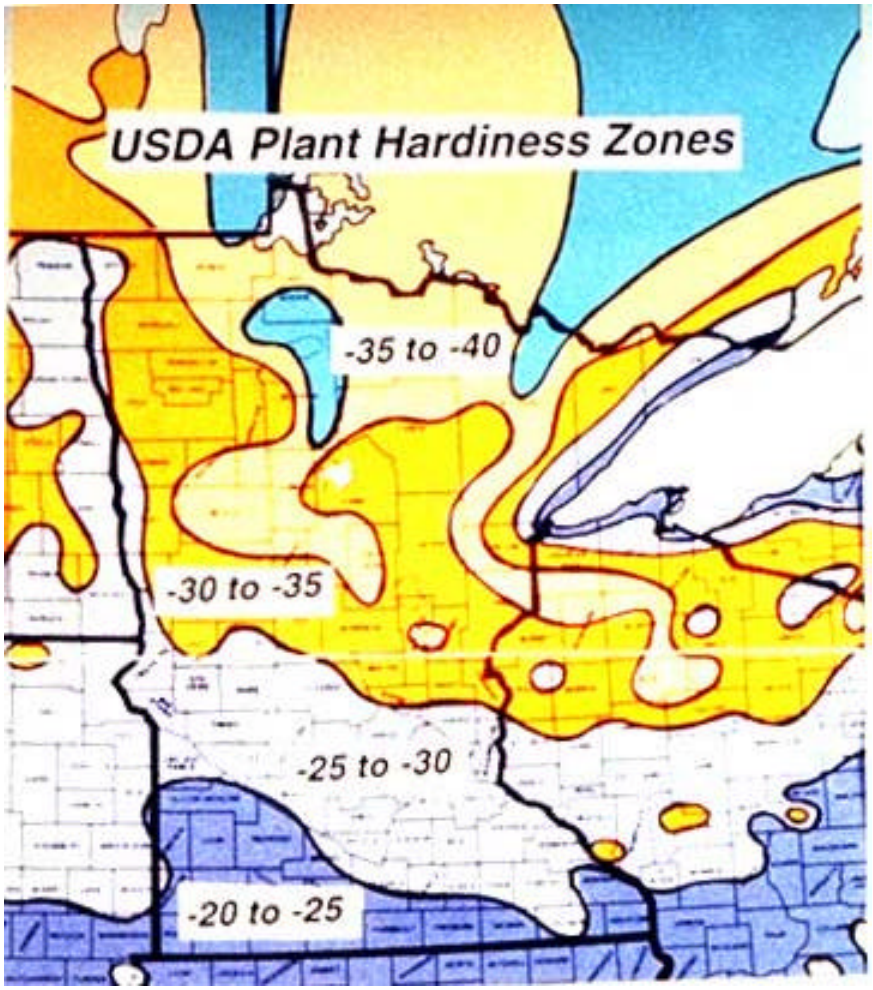
A peony is an well-known example of a hardy herbaceous perennial. Peonies have showy flowers in mid to late May in Minnesota, then have attractive foliage for the rest of the summer. They are long-lived perennials that like full sun and well-drained soil.

Russian sage, *Perovskia* is an example of a sub-shrub, or woody plant in milder climates but in Minnesota it grows as an herbaceous perennial.

Foxglove, *Digitalis purpurea,* has been grown in gardens for many years. It is a biennial, growing as a basal rosette the first year, sending up a flowering stalk the second year. After flowering the plant dies. It takes two years for the plant to complete its life cycle,then it dies. Waiting two years for a flower requires more patience than many gardeners have. Fortunately biennials usually are good at self-seeding and a patch of foxgloves can appear to be growing as perennials. Plant them where they will not be disturbed, allow self-seeding and then one and two year old plants can grow together so some are always blooming.



Here is the USDA Hardiness Zone map. Minnesota falls into Zones 3 and 4, where the average minimum winter temperatures are -40^0 to -30^0. It is important to know your winter hardiness zone in selecting plants that will do well in your climate. Some herbaceous plants can withstand colder zones than predicted if they are protected with winter mulch, but many will not.



A closer look at Minnesota and the two main hardiness zones. Each zone is subdivided into zones a and b. The Twin Cities is in the colder part of zone 4, or 4b. There is a small area of Zone 2 in northern Minnesota.

Perennials are popular because the plants change dramatically through the seasons. Let's look at three different seasons at the Minnesota Landscape Arboretum. This photo was taken on the 4th of July, in mid summer.

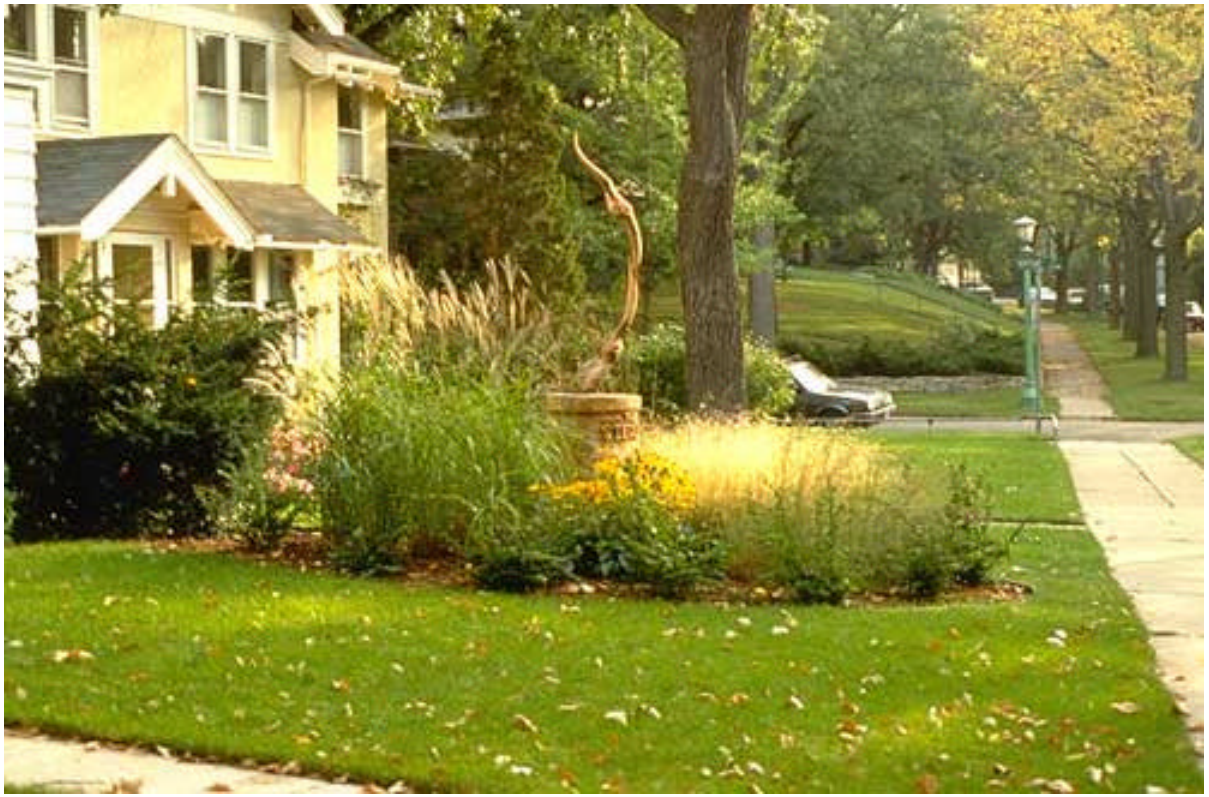
The same location in mid September. Sedum ‘Herbstfreude’ or ‘Autumn Joy’ is in the foreground and behind the sign is *Panicum virgatum* or switchgrass.

Winter at the same location. Many perennials like switchgrass, have winter interest. For climates with a long winter, it makes sense to plan for winter interest in the garden.

In planning your perennial garden, consider three questions. The first, **what is your style?** Do you like formal gardens, such as the Clemens Garden in St. Cloud? Formal gardens have straight lines, are often symmetrical, and may change little throughout the seasons. Even on a small scale, you can create a formal design. This style is more controlled; it is obvious that man has designed the garden, not nature.

Or perhaps you like informal, more natural designs, such as this backyard. Natural designs have curved lines, not straight edges. They are usually not symmetrical and do not look the same all year, in fact the changes through the seasons are what gardeners like. These designs are not obvious in their man-made appearance, they look natural and you may question did nature do the design or did people?

Look carefully at your home to determine the style of your house as you plant you garden. This home used to have large evergreens (typical of formal designs that would not change through the seasons) and the owner removed them to plant perennials. The home design is symmetrical and could be enhanced by a symmetrical formal planting. It also could become an English cottage garden with the Tudor style house, and have climbing roses and perennials that fill the front yard.



The second question to consider is **what is the purpose of your perennial garden?** Is it to be viewed from the street as well as from inside your home as in this slide? Is it for you to view from your kitchen window? To add color to your backyard and have flowers blooming spring through fall?

Perhaps you want to decorate an outdoor patio with flowers. What time of day will you use the patio, should you plan for fragrant flowers at night, or showy blossoms that look good all day? Determining your purpose can assure you reach your goal.

The last of the three questions to consider in perennial design is **what is your site?** Here is a tough site, under the deck of a home where there is dry shade, one of the most difficult sites for plants. You may be able to grow plants here, but it will be very important to select the correct ones. A good thing to remember is “garden with your site, not against it.” Some woodland wildflowers would tolerate these conditions, but only if light and water were available.

Here is another shady site that is more prominent and easier to landscape than under the deck shown previously. However, the driveway and tree roots represent a challenge. Soil type and moisture level are other important site considerations.

Perhaps your site is in full sun with no protection from heat and drying out. There are plants for almost all sites; we are still learning which ones will grow best in difficult conditions. Finding plants in their native habitats tells a great deal about where they like grow. Visiting display gardens and taking notes will help you make good choices.

Soil preparation is critical in growing perennials. Done correctly before planting, you can enjoy years of beautiful flowers. Have your soil tested (contact your local Extension office for information) to determine which nutrients are needed and what your soil pH is. Most soils will benefit from additional organic matter, that will improve the soil structure, add water holding capacity and create air spaces. Good sources of organic matter are big bales of sphagnum peat moss, composted manure, and compost. It is **very important** to kill or remove all existing perennial weeds, such as quackgrass before you plant perennials. Perennial weeds are easy to kill before you plant, but will be difficult to deal with once your flowers are growing. Use a total kill herbicide such as Roundup®, until you know the weeds are dead. Then add fertilizer based on the soil test results.

The next decision is what to plant. There are hundreds of perennial and more come on the market each year. Which ones should you choose? Visit gardens such as the Minnesota Landscape Arboretum to get ideas.

Noerenberg Gardens in western Hennepin County is another good place to see many perennials.

Things to consider when selecting perennials are the time of bloom, texture, height, color and soil or site. Time of bloom is important because most people want plants blooming throughout the growing season. Here is a perennial garden in early spring, just as the snow has melted. Tulips and other spring bulbs are good choices for very early flowers.

The same garden in September. On the right is ‘Centerpiece’ chrysanthemum, black-eyed Susan is on the left, phlox is in the background right. The Extension publication *Growing Perennials,* BU-6521, has a listing of order of bloom, which can assist you in selecting plants to bloom all summer long.

Texture is an important consideration also. Coarse textured hosta provides relief for the eyes. Using all fine textured plants can be monotonous. Grouping more than one plant, (try using 3 or 5) is also a good idea.

Height is a simple characteristic, and perennials can be very tall as the giant smartweed, or knotweed, *Poylgonum sachalinense,* grown for years at Munsinger Gardens in St. Cloud. Place large perennials in the background of borders and beds.

Color can apply to foliage as well as flowers. Silver foliage is usually a sign the plant is drought tolerant. Silver or white foliage combines well with many perennials. In the foreground is *Stachys byzantine,* lamb's ear, in the background is *Artemesia* or wormwood. The dark foliage near the walk is coral bells, *Heuchera* 'Chocolate Ruffles'.

Flower color can have a big impact in your garden. Red is a “hot” color and attracts attention. It can point the way and leads your eye down this path. Avoid using hot colors such as red, orange or gold in areas you want people NOT to notice.

A monochromatic garden can be very showy. The Clemens White Garden in St. Cloud used English gardens as a model. White is a standout color, calling for attention. It looks very clean, and represents purity, but it can be overpowering in a garden. Balance it with other strong colors, as seen in the next slide. White can also be used to separate colors you'd find jarring together.

Here red and white are interwoven to make an eye-catching display.

Complimentary colors of orange and blue make a nice contract. Notice how the hot orange catches your eye. Blue and purple, the cool colors, recede and fade away. In the evening, blues and purples are easily lost.

Combinations of blue, white and pink can be very restful and cool. Even on a hot deck, these colors make it seem cooler. Imagine red and orange flowers and the feeling of heat becomes more intense for an already hot deck. Colors evoke feelings; think about which feelings you wish to convey in your garden.

Before selecting specific plants, again, it is important to emphasize that you study your site. How much sun or shade is there? What type of soil do you have? Is it dry or moist, light or heavy? Even in a small property, you may have 2 or 3 very different sites. Take advantage of them to garden with your site, not against it. The next 50 slides cover specific perennials, along with their site preferences.

Asclepias tuberosa, butterfly weed, is a native perennial usually found on lighter, well-drained sites. Definitely a hot color, it catches your eye in the garden. This taprooted plant dislikes transplanting and wet soils especially in winter. It attracts butterflies all summer. This is the first of five perennials for drier sites.

Achillea millifolium and Achillea filipendula, yarrow, are perennials anyone can grow. The first species can be weedy and easily self-seeds. ‘Summer Pastels’ is a nice selection with yellow and pink flowers, but be sure to weed out seedlings, which usually revert back to the plain white form.

Bright yellow cultivars of *Achillea filipendula,* such as ‘Altgold’, or ‘Coronation Gold’ are good for hot sunny sites. Yarrow tolerates drought well and doesn’t need supplemental watering. It prefers light, sandy soil but can grow on heavy clay. Yarrow can tolerate most any site or conditions except deep shade.

Geranium maculatum, wild geranium, is native to the woods in much of eastern and Northern Minnesota. This is a good choice for dry shade. In the spring, blue-purple flowers on 2 ½’ plants can carpet a shady area. It will grow in moist sites as well.

Sedum kamtschaticum, stonecrop, is a good plant for hot, sunny, dry sites. Rock walls, or boulevard plantings, between the sidewalk and the street, are suitable sites for sedum.

Sedum ‘Herbstfreude’ or ‘Autumn Joy’ in the foreground is an excellent hardy perennial with four seasons of interest. Its attractive foliage grows in early spring, the late summer flowers resemble large pink heads of broccoli, and the seedheads remain showy throughout the winter. A compact plant about 2’ tall, plant this in well-drained soil in full sun. Lots of water, shade, or fertilizer are unnecessary and can make the plant fall over. In the background is *Rudbeckia* ‘Goldsturm’, an improved strain of black-eyed Susan. A showy 18-30” plant, it flowers from mid July through the fall. Although tolerant of somewhat dry sites, it prefers moister soils than sedum.

Bearded iris, *Iris* species and hybrids tolerate dry soils also. The plants are shorter in very dry sites, but they tolerate dry soils better than moist or set sites. This slide shows an intermediate bearded type called ‘Cheers’. The Arboretum has a large Iris collection maintained by the Iris Society. If you have a favorite plant, there is likely a society to support it, contact the Arboretum or the Minnesota State Horticultural Society for more information.

Tall bearded Iris are very showy when in bloom. Unfortunately the flowers last only a short time, typical of many long-lived perennials. Iris need division every few years for best flowering.

Now, let’s look at five perennials for moist soils. *Astilbe* ‘Bridal Veil’ is an attractive plant. Astilbe loves moist to wet soils. Its compound foliage compliments the panicles of tiny flowers. Flower colors of red, pink, purple and white are common.

Astilbe at Glensheen Mansion in Duluth, MN. In moist, high organic matter soils, astilbe will live for a long time. Hosta and annaul impatiens complete this planting.

Filipendula rubra, queen of the prairie, is a native plant of wet meadows and marshes. Its fuzzy flowers are borne on 4’ stems. The foliage is similar to raspberries, but without the thorns. Although it prefers moist soils, it will grow in regular well-drained soil as well.

Here is queen of the prairie with *Monarda* or bee balm, on the right. Although usually pink, there are white cultivars of *Filipendula* also.

Monarda didyma and *Monarda fistulosa,* bee balm or wild bergamot, are other native plants that grow in wet soils. *M. didyma* is native to moist or wet woodland sites in Eastern US. Flower color varies in shades of red and pink.

M. fistulosa is native to the prairie of the Midwest. It in one of the most versatile plants and is found on wet, mesic (medium soil moisture) and dry sites. *M. fistulosa* is usually a light lavender in color. *Monarda* often gets powdery mildew, a foliage disease. The *M.didyma* species is especially susceptible. Crosses between the two species have resulted in cultivars resistant to powdery mildew. Good resistant cultivars for Minnesota are: ‘Marshall’s Delight’, shown here; ‘Petite Delight’ (a dwarf, 12” tall plant), and red flowered ‘Jacob Cline’. Bee balm is attractive to bees, hummingbirds and butterflies. Its leaves have been used for making tea.

Ligularia, ragwort, are good plants for wet or moist sites. ‘The Rocket’, shown here is 4-6’ tall, with showy yellow spikes of flowers. Note the large coarse foliage.

Note the dense flat-topped flower heads in *Ligularia dentata* ‘Desdemona’, with dark purple or red foliage. The leaves of all types of ragwort wilt in sun, to the point of looking near death, but they recover quickly when out of direct sunlight.

Eupatorium maculatum, Joe pyeweed, is native to eastern and midwestern states. Found in ditches and along wet areas, its large coarse leaves whorl around the 4-6’ tall stems. The large panicles of tiny pink flowers are very attractive to bees and other insects, including butterflies. This is a good plant for the background of a perennial border. New cultivars are shorter in height, only 3-4’.

Now, let’s look at perennials for shade. Hosta are a favorite for many people. What a wide assortment of foliage color and size are available in this genus. Hosta do very well in our cold climate. Their large fleshy roots compete well with trees, and they can grow in fairly dry sites, although they will be smaller plants, and may not flower. Yellow-leafed cultivars will tolerate more sun, but hosta still prefer some shade, especially near hot areas such as sidewalks and driveways.

Hosta may grow on tough sites like this, if the area is in some shade. Hosta, especially the common green *Hosta lancifolia* seem to tolerate poor soil conditions quite well.

Tradescantia ohiensis, spiderwort, is native to the prairie. It grows in the shade of taller plants and can be planted under trees and in dry shade sites. It resembles a daylily, with its long strap-like leaves. Although borne in clusters, only one or two flowers open each day, so spiderwort blooms over a long period of time, usually from May until late July. It has very few insect or disease problems; the native form has pink or blue flowers.

Here is a garden cultivar ‘Snowcap’ with white flowers.

Don’t overlook woodland wildflowers when you are thinking of shade tolerant perennials. Although most bloom in the early spring, they are good choices to plant in beds under trees and in shady places. *Trillium grandiflorum,* showy trillium, is a beautiful wildflower, that you may find in garden centers in the spring. The three leaves, 3 petals and 3 sepals, account for the name trillium.

Use trillium with other spring flowers such as forget-me-nots, *Myosotis sylvatica*.

Aquilegia canadensis, the native columbine is easy to grow. It tolerates shade and self-seeds if conditions are favorable. The native form has yellow and red bicolor flowers. Hybrids grown in gardens are large flowered and vary widely in flower color, with bright pastels, bicolor and even dark purple or black. Columbine tends to be short-lived, so protect and encourage seedlings in the garden.

Native columbine is in the background of this photo. *Hydrophyllum virginianum,* Virginia waterleaf, is in the foreground. Virginia waterleaf is very easy to grow and naturalize in woodland or shady conditions in moist or dry sites. Some people think it is too aggressive. The common name comes from the water spots on the foliage.

The last plant recommended for shade is another native, *Cimicifuga racemosa,* black snake root. A large planting of this is on the entry drive into the Arboretum. Black snake root is often found on the edge of the woods, in moist to slightly dry soils with high organic matter.

The 6’ candle flowers are beautiful. Sometimes called bugbane, insects are very attracted to the plant while some people find its odor offensive. Others smell nothing. The large compound foliage is attractive from spring until winter. Few shade-tolerant plants are this tall.

The remaining perennials we will look at prefer full sun and well-drained soil. *Baptisia australis,* false indigo, is a member of the legume or bean family and is native to the prairie in Minnesota. Its large oval shrub-like appearance develops slowly.

The blue flowers are similar to lupine and bloom in late May or early June. If you have been disappointed with the short-lived lupine, try false indigo. It is a long-lived perennial, but doesn’t like to be transplanted. The attractive bean-like seed pods remain on the plant in winter for added interest.

Heliopsis helianthoides, oxeye, is an easy to grow, showy native plant of the Minnesota prairies. About 4’tall, its bright yellow flowers are similar to tiny sunflowers.

Garden cultivars of oxeye such as ‘Summer Sun’ are compact and improved forms for beds and borders.

Daylilies*, Hemerocallis*, are a favorite of gardeners. One of the toughest garden plants, daylilies tolerate some shade, tree roots, and many soil types. They live for many years and increase rapidly. ‘Happy Returns’ is a pretty yellow daylily that flowers repeatedly over the summer.

‘Stella d’Oro’ is probably the most popular cultivar of daylily. Easy to propagate and known for its long flowering time and shorter, 3’, growth habit, it has been planted by the thousands in landscapes and home gardens. Here it is covering a bank near the home demonstration garden at the Arboretum. Don’t overlook daylilies for use as ground covers on difficult sites.

Coreopsis verticillata ‘Moonbeam’ is an attractive, 12-18” tall fine-leafed perennial. It’s known for flowering from mid to late summer. It likes well drained soil in full sun. This cultivar may be short-lived or winter kill in Minnesota, so a winter mulch is a good idea for this plant. ‘Zegreb’ may be a hardier cultivar.

Coreopsis lanceolata ‘Early Sunrise’ is similar, but has double flowers, and wider foliage. Growing about the same height, this cultivar requires the same well-drained soil and full sun. Some people treat ‘Early Sunrise’ as an annual, and are pleased if it overwinters. Use winter mulch and avoid locations where the soil remains wet, especially in winter.

Chrysanthemums are a standard garden perennial. The University of Minnesota has developed many types such as ‘Lemonsota’ for our climate. Look for the publication Garden Chrysanthemums FS-7068, for a complete description of flower color, height and bloom time.

‘Rosy Glow’ is a beautiful deep rosy pink, on 12-18” plants. Winter protection is always a good idea on mums.

‘Centerpiece’ is a tall rose lavender mum, growing about 2½’ in height. A day neutral mum, it flowers in July if the plants are not pinched back in June. The traditional advice of pruning mums until early-July, assured compact plants that bloomed in the fall. Left unpruned, ‘Centerpiece’ will bloom from mid July until frost. ‘Centerpiece’ is not frost sensitive, so it will be showy into the fall.

Purple coneflower*, Echinacea*, is a tough perennial. Native to the western part of Minnesota, and the Dakotas, it tolerates heavy clay soil and high (8.0) pH. It likes full sun and reseeds easily. The species *E. angustifolia, E. purpurea and E. pallida* are all similar.

‘Bravo’, is a white form, of purple coneflower. Seedlings of echinacea may vary from the parent. Finches love coneflower seed and often feed on the plants in the winter.

Heuchera ‘Brandon Pink’, coral bells, is long-blooming perennial that likes sun and well-drained soils. Coral Bells can tolerate drought. Flowers come in May and last through mid-summer. The basal, heart- shaped foliage is almost evergreen.

Heuchera ‘Chocolate Ruffles’ has dark purple to brown foliage. Mulch in winter to prevent frost heaving.

Phlox divaricata is native to woodlands in Minnesota. Flowering in early May, it is showy with tulips and spring flowering bulbs. About 8-12” tall, it will grow in partial shade.

Phlox paniculata, the tall garden phlox is very showy in mid-summer. These large panicles come in many colors including lavender, white, pink, red and bicolors. A common problem for garden phlox is powdery mildew, a fungus that causes a white discoloration of the foliage. Planting disease resistant cultivars such as David', 'Sandra' and 'The King' is the best prevention. Disease severity may vary from year to year and garden location. Garden phlox easily self-seeds and reverts to a weak lavender or pink color. These plants should be weeded out before they overtake the hybrids with better flower color.

Phlox sublata, moss pink, is one of the first perennials to bloom in Minnesota. By mid-May this low growing, 6-8’ plant is covered with flowers. The plants must have well-drained soil, especially in the winter, and do best with winter protection in zone 4.

Paeonia hybrids are easy to grow in the north since they require a cold period, and that is easy for Minnesota to provide! Full sun and moist soil with high organic matter are best for peonies. If your plant is flowering well every year, do not move or divide it. Peonies are very sensitive to planting depth. 1½” to 2” is the proper planting depth for the eyes or growing points. Anything below this range will inhibit the plants from flowering, so moving the plants often can interfere with flowering if you’re not careful.

Ever wonder why ants are always on peony flowers? They protect the flowers from other insects and feed on sugar secretions from the flower buds. Ants and peonies have developed a synergistic relationship, they both benefit, so do not try to remove the ants.

Lilies are wonderful perennials for Zone 4. They do not mind the cold and can increase over the years. Plant the bulbs in full sun in moist but well drained soils. Asiatic and oriental lilies are two popular types. Asiatic lilies have slightly smaller flowers, usually outward or upward facing, with little fragrance and usually no markings or spots on the petals. They are very easy to grow in Minnesota.

Oriental lilies are usually larger flowered, outward or downward facing, very fragrant, with contrasting spots on the petals. Oriental lilies can be harder to grow, they require better drainage and more soil organic matter, a more acidic pH, and may winter kill. ‘Casa Blanca’ shown here is a dramatic white; ‘Stargazer’ is a well-known pink-flowered oriental.

Salvia ‘Mainacht’or "May Night' is in the background of this slide. About 18’tall, its dense spikes of blue-purple flowers bloom in early to mid-June. In shade, the plants are taller and may require staking. Cut back after flowering for a second bloom in late summer. A member of the aggressive mint family, this plant can self-seed and is easy to grow. *Alchemilla mollis,* lady’s mantle, is the yellow green flower in the foreground. Often used as a ground cover or edging plant, it is easy to grow in sun or light shade.

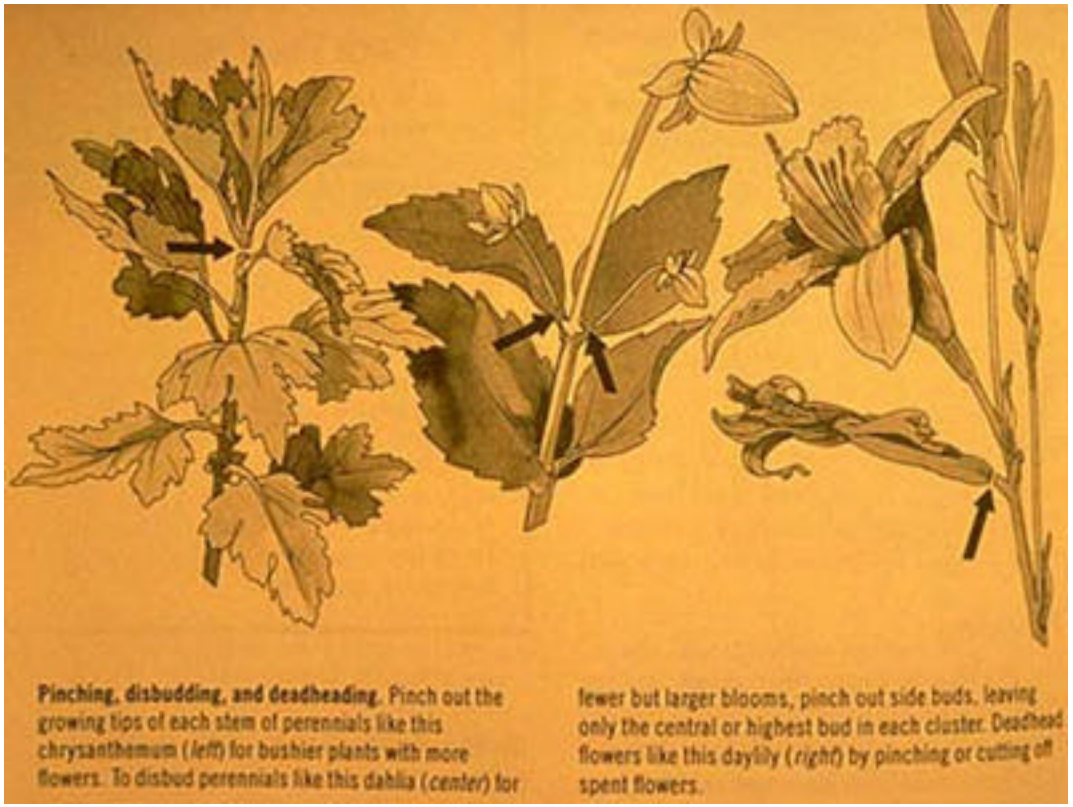
Silphium perfoliatum, cup plant, is a dramatic 6-8’tall native wildflower found in sunny prairies. The daisy-like flowers, typical of the sunflower family are only about 2” across. Found in wet to medium soils, cup plant does well in heavy clay.

The large square stems of cup plant bear coarse foliage that is joined at the stem to form a cup, hence the common name. Birds and insects feed on the water that remains in the cup. Finches love the seeds as well. This tall perennial is good for the back of the border or naturalized areas.

Aster novae-angliae ‘Purple Dome’ is an improved cultivar of the native New England aster. It is 2’ tall and has blue-purple flowers in the September. Plant it in full sun and well drained soil.

Let’s move now to cultural information, such as summer mulching. Applying an organic mulch in the spring or summer has many benefits: it keeps the soil cool, reduces weed growth, eliminates the need for cultivation and root damage, and adds organic matter to the soil. It also protects soil from pounding raindrops or irrigation water. Compost makes a good mulch.

Winter mulch should be applied **after the ground is frozen to keep the temperature constant and avoid freezing and thawing,** which can cause plants to heave out of the soil,killing them. A winter mulch keeps the ground at a constant temperature, near freezing and avoids crown damage. Remove winter mulch in the spring, usually in mid to late April for central Minnesota. Compost, **shredded** leaves, weed-free straw or hay are good winter mulches.



This illustration from the book, *Illustrated Encyclopedia of Perennials* by E. Phillips and C. Colston Burrell, © 1993 Rodale Press, Inc. compares three important maintenance practices for perennials. On the left is pinching, which encourages side branches, makes the plant compact and uniform and delays flowering. In the center is disbudding, or removal of (usually side) flower buds **before** flowering. This causes one large flower to develop, as show dahlias, or roses. On the right is deadheading, removal of flower buds **after** flowering to prevent seed set. Deadheading increases flower production. The larger the flower, the more benefit from deadheading. A combination of pinching and deadheading can be done after flowering to encourage a second bloom in some perennials such as salvia, delphinium, monarda and phlox.

Watering can be critical for perennials, especially in dry summers. A soaker hose is an efficient way to water, with little loss to evaporation. A good time to water is in the early morning. If you use overhead watering, morning application will allow the foliage to dry out before evening which reduces foliage diseases.

Division is a maintenance practice that can be a fun way to increase your plants, as well as rejuvenate them. Some plants like iris grow best when divided every few years. Others, like peony, may never need dividing. A good rule of thumb is to divide the plant when it is dormant or not flowering. In general, spring-flowering perennials can be divided in fall and fall-blooming ones in the spring. Hosta and daylilies can be divided almost any time, if they are well watered afterward.

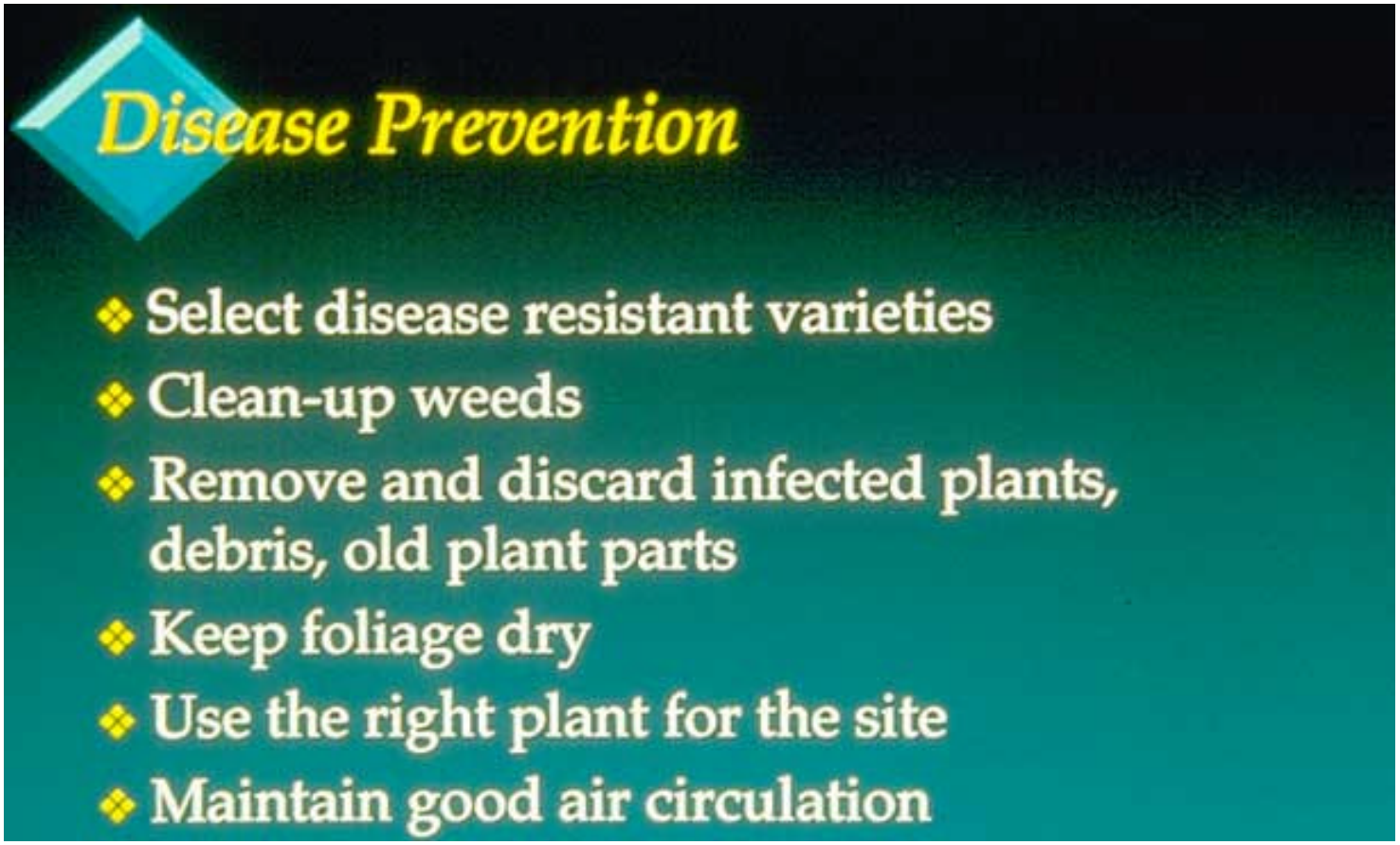
Catnip, *Nepeta xfaassenii* is an aggressive plant. A clump here has been dug and the foliage cut back for easy handling, and to reduce wilting. A vigorous grower, catnip can easily come back after division during active growth, but most plants respond better when divided during dormancy or when they are beginning to grow the spring.

This plant was divided into 4 equal new plants. Actually more divisions could have been made since catnip is easy to grow, but a large section of roots and crown assures good survival.

Liatris spp. gayfeather, forms a dense mass over time.

Gayfeather, like gladiolus or crocus grows from a flattened stem, or corm. On the left is the mother plant cut in half and on the right are the separated, individual plants, each with a corm at the base. Overtime many of these corms develop and the plant becomes crowded. The large white center of the mother plant root is the normal "dead center" that develops over time. It consists of stored food that is typical of many perennials. Remember stored food is an important part of a perennial, since it assures continued growth each year.

Each individual gayfeather can be planted or a group of 3 to 5 placed together will make a bigger display. Shown here at division in early to mid-May, these individual plants did flower the same year.



Disease prevention is important for successful perennial gardening. This list shows how to avoid problems in the first place. If followed it can result in fewer chemical controls for pests. Try to follow each of these recommendations for a problem-free flower garden.

Let’s look at some common perennial problems. Can you guess what each one is? Try to! You may have seen these in your own garden. The answers are listed on the reverse side of your handout. (Note: the handout can be duplicated to use with this slide set.) ‘Indian Summer’ is a large flowering cultivar of black-eyed Susan. Can you guess the problem? This is powdery mildew, a common foliage disease. Use resistant cultivars, keep the foliage dry, and if possible improve air circulation for control. Some gardeners thin out the plants to improve air circulation, but resistant cultivars are the best control. Powdery mildew doesn't kill the plants, it can weaken them however, and most gardeners do not like the appearance.

Distorted or green, weird growth can mean aster yellows, a very tiny organism causes this disease that has no cure but removing the affected plants. Aster yellows affects asters, shown here, as well as gay feather, coneflower, many weeds and other flowers. It may come and go from year to year and is spread by leafhoppers which carry the disease from plant to plant.

Aster yellows on marigold; note the yellow color and distortion. Often the discoloration is chartreuse.

Astilbe brown and dry from lack of water and moisture. Plant astilbe where they will get adequate moisture. Full sun is OK if the soil stays moist.

Sunburn on hosta. Protect from direct, afternoon sunlight, or try yellow-leafed forms.

Botrytis on flowers and leaf spot diseases on the foliage of zinnia. Although zinnia is not a perennial, these diseases are typical of perennials. Keep the foliage dry, use resistant cultivars and improve air circulation as preventative measures.

Ball-shaped growths on goldenrod or *Solidago* spp. are common. These are galls and are caused by an insect. They are not fatal and are not worth controlling.

This thick or strap-like growth on dame's rocket, *Hesperis matronalis*, is called fasciation. Instead of one terminal growing point, many cells parallel to each other grow at the same rate and all coalesce to make a broad, thick stem. Mechanical or insect injury may cause fasciation. Some flowers, like celosia, often have it, and gardeners have selected plants that grow this way as ornamentals. Lilies and other perennials have a tendency to growing this way. The following year, the plants may have no fasciation.

Here is iris borer, a dreaded insect that can be very damaging even fatal to bearded iris. The adult moth lays eggs in April and May, which hatch into tiny larvae that feed on the leaves and work their way down to the rhizome by mid summer. By this time, frass and holes are evident in the foliage and often a odor or rotten smell from bacterial soft rot, which usually follows the borer as a secondary problem.

Control includes fall cleanup of old foliage, followed by spraying with cygon or dimethoate in late April and early May when adults are active. Beneficial nematodes may provide some control.

Siberian iris, *Iris sibirica,* rarely get the borer. Planting them instead of bearded iris is a good control measure. Sometimes removal of bearded iris is the only way to eliminate the borer. Borer wins, gardener looses !!

Slug damage on hosta. Slugs love the same shady moist growing conditions that hosta do. Putting a coarse, dry substance on the soil, such as diatomaceous earth repels slugs. And trapping in any moist place, under boards, grapefruit, can also be effective as can the use of slug baits or insecticides labeled specifically for slugs.

Look closely along this stem of oxeye, *Heliopsis helianthoides*. Aphids, all in a row, feeding with gusto !! Initially the insects cover the new growth, causing disfiguration and distortion, a key sign of aphids on many plants.

Later, the honeydew that the aphids secret becomes so thick it turns black, sooty mold develops and discolors the foliage as shown here. Use regular high pressure sprays of water, or insecticidal soaps or insecticides labeled for aphids for control.

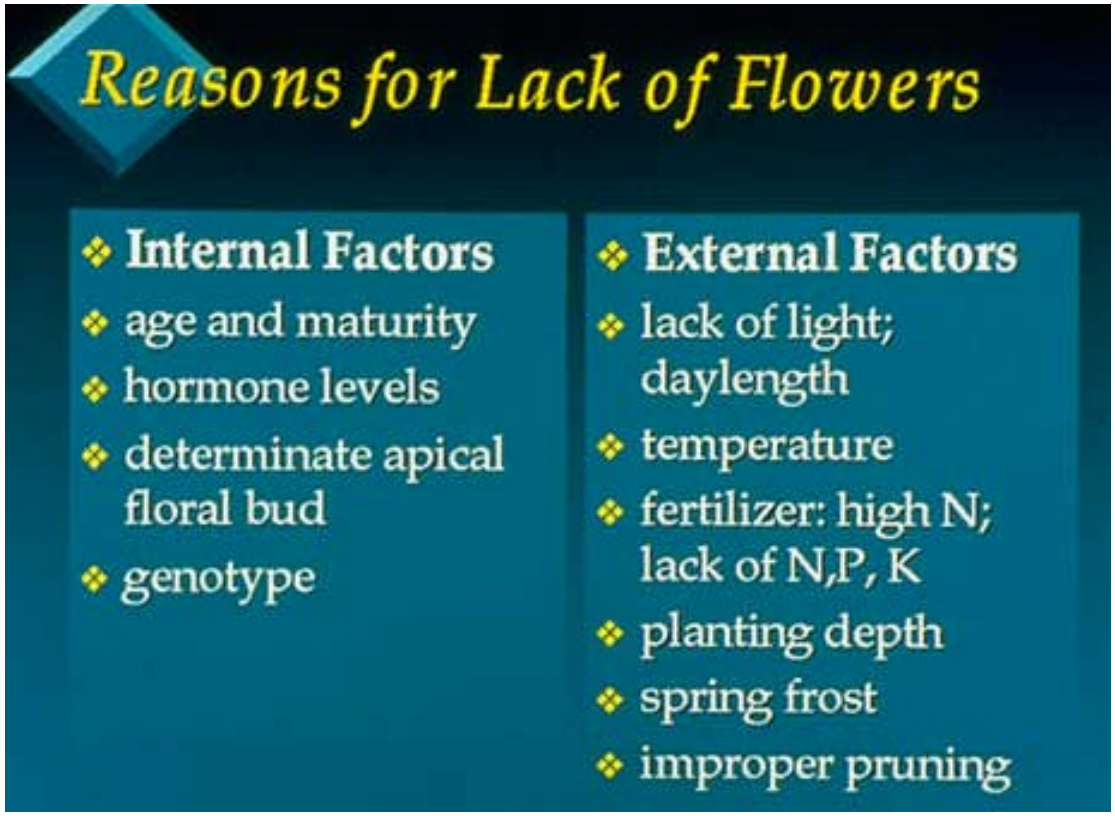
Cold injury on tulips. Spring flowering bulbs can withstand 32 degrees and even 25 degrees, but in the spring of 1997, it was 10 degrees in early April; too cold for spring flowering bulbs. The foliage was killed. This bed of tulips was too damaged to grow and plants were removed. The daffodils survived much better that year.

No leaves, removal by?? deer, most likely. Hosta are in the lily family, along with tulips and onions, know for good eating by humans and animals. Amaryllidaceae plants such as daffodils and snowdrops are not eaten because this family has toxins repelling deer or rodents.

What killed this lily flower? Note the dry brown buds and white powder along the stems.

Another borer. Inside the stem is a mature borer, the white was material or droppings, the outward sign of the insect. Chemical control in early spring may be necessary, but lily borer is not nearly as common as the iris borer.

What are these tiny black growths at the base of this lily's leaves? Bulbils, or aerial new plants ! Yes, you can grow new lily plants by planting these, but it will take several years. They're just a sign of a healthy, vigorous plant.



Why didn't my plant bloom? This is probably the most asked question in growing perennials. This list shows the many reasons a plant can fail to bloom. Some of these you can control, others you cannot. Learning the cultural requirements of your perennials will help you understand a lack of flowers.

In closing, remember to visit and gather inspiration from the formal gardens in Minnesota such as Clemens Garden in St. Cloud.

Or the Minnesota Landscape Arboretum, where you can see informal perennial beds such as this. Perennials can add beauty and enjoyment to your home year round.

The slide set is from the University of Minnesota Extension Service. For more information and other publications contact your local county Extension office or look on the Internet at www.extension.umn.edu

UNIVERSITY OF MINNESOTA

Extension

SERVICE

Herbaceous Perennials for Minnesota

Mary H. Meyer, Extension Horticulturist

Questions to consider in selection and planning a perennial garden:

1. What is your style ? formal or informal, style of home, personal preference
2. What is the purpose of your perennial garden ? display from street, border, view from kitchen, dining room, outdoor eating area, etc.
3. What is your site ? soil type; exposure, other factors.

Soil Preparation

1. Do a soil test.
2. Add organic matter.
3. Apply fertilizer and perhaps lime based on the soil test results.

Plants pictured in the order of the slide set:

Botanical Name	**Common Name**
For dry sites:	
Asclepias tuberosa	butterfly weed
Achillea millifolium 'Summer Pastels'	yarrow
Achillea filipendula 'Coronation Gold'	yarrow
Geranium maculatum	wild geranium
Sedum kamtschaticum	stonecrop sedum
Sedum 'Herbstfreude', 'Autumn Joy'	sedum
Iris spp. and hybrids	bearded iris
For moist to wet sites:	
Astilbe 'Bridal Veil'	astilbe
Filipendula rubra	queen of the prairie
Monarda didyma	bee balm
Monarda fistulosa	wild bergamot
Mildew resistant: Marshall's Delight, Petite Delight (a dwarf, 12" tall plant), Jacob Cline.	
Ligularia 'The Rocket'	ragwort
Ligularia dentata 'Desdemona'	bigleaf ligularia
Eupatorium maculatum	Joe pyeweed
For shady sites:	
Hosta spp.	hosta
Tradescantia ohiensis	spiderwort
Trillium grandiflorum	showy trillium
Aquilegia canadensis	columbine
Hydrophyllum virginianum	Virginia waterleaf
Cimicifuga racemosa	blacksnake root
Perennials for sunny, well drained soil:	
Baptisia australis	false indigo
Heliopsis helianthoides 'Summer Sun'	oxeye
Hemerocallis "Happy Returns'; 'Stella d' Oro'	daylily
Coreopsis verticillata 'Moonbeam'; 'Zegreb'	threadleaf coreopsis

Botanical Name	Common Name
Coreopsis lanceolata ‘Early Sunrise’	tickseed
Chrysanthemum ‘Rosy Glow’, ‘Centerpiece’	mums
Echinacea spp.	purple coneflower
Heuchera ‘Brandon Pink’	coral bells
Heuchera ‘Chocolate Ruffles’	coral bells
Phlox divaricata	woodland phlox
Phlox paniculata	garden phlox
Phlox subulata	moss pink
Paeonia hybrids	peony
Lilium spp. Asiatic	
Oriental types: ‘Casc Blanca’	lilies
Salvia ‘Mainacht’or "May Night'	perennial sage
Alchemilla mollis	lady’s mantle
Silphium perfoliatum	cup plant
Aster novae-angliae ‘Purple Dome’	New England aster

Disease Prevention

Select disease resistant varieties
Clean up weeds
Remove and discard infected plants
Keep foliage dry
Use the right plant for the site
Maintain good air circulation

Failure to Bloom

Internal factors	*External factors*
age and maturity	lack of light; daylength
hormone levels	temperature
determinate floral bud, tulip	fertilizer: high nitrogen
genotype, genetic control	lack of fertilizer
	planting depth
	spring frost
	improper pruning

Common Problems, Can you guess them?

Powdery mildew
Aster yellows
Drought on astilbe
Sunburn hosta
Botrytis and leaf spots on zinnia
Gall on goldenrod
Fasciation on dame’s rocket
Iris borer, use Siberian iris
Slug damage
Aphids
Cold injury
Deer damage on hosta
Lily borer
Lily bulbils

For more information look for these Extension publications:

MI 6521 Growing Perennials
FS-1428-Gardening in the Shade
FS-7068- Garden Chrysanthemums
Internet: www.extension.umn.edu