



THE UNIVERSITY OF GEORGIA

COOPERATIVE EXTENSION

Colleges of Agricultural and Environmental Sciences & Family and Consumer Sciences



DAYLILY CULTURE

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Daylily Culture

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Daylilies are one of the best perennials that can be selected for Georgia gardens. They are easy to grow, provide blooms over a fairly lengthy period, and contribute both line and color in the landscape.

Great improvements have been made over the original daylilies imported into this country. The lemon lily (*Hemerocallis flava*) and tawny daylily (*Hemerocallis fulva*) found their way to the United States in the 18th and 19th centuries. The orange-colored tawny daylily has become naturalized in many areas of Georgia.

Thanks to modern hybridizers, we now have daylily cultivars exhibiting red, orange, gold, melon, yellow, pink, lavender and near-white flowers as well as exquisite combinations of these colors.

Hemerocallis is the name given the daylily group. This name is derived from the Greek terms *Hemero* (for a day) and *Callis* (beauty), *i.e.*, beauty for a day. It is true that individual flowers last only one day, but new buds on the flower stalks (scapes) open almost daily. Sizeable daylily clumps having numerous flowering scapes can remain in bloom for an entire month.

Botanical Information

Hemerocallis are in the lily family. Some botanists consider them to be more closely related to amaryllis. They differ from lilies somewhat because they do not grow from true bulbs. The flowers are borne on leafless stems.

Daylilies are hardy, herbaceous perennials having clumps of smooth, grasslike foliage (Figure 1). Narrow, heavily-ribbed leaves are long and two-ranked, forming regular fans. Certain varieties are referred to as evergreen because a portion of the foliage remains green throughout the winter. Others are completely deciduous. Slender flower stalks called *scapes* grow upright and arise from the lower portion of the crown. Scapes usually extend above the foliage, branch near the top, and bear clusters of lily-like flowers.

According to cultivar, daylilies may produce large (more than 4½ inches in diameter), medium (from 3 to 4½ inches in diameter), or miniature flowers (less than 3 inches in diameter). The flower parts include (Figure 1) stamens (pollen bearing organs) and a single three-

part ovary (immature seed capsule). The upper part of the perianth (flower parts) is divided into six parts, the inner three segments called *petals* and the outer three parts called *sepals*. The perianth is tubular from the ovary to the point where the stamens are attached. The stature of most daylilies ranges from 18 inches to 5 feet.

The root systems vary from almost fibrous to the more common fleshy type. A few have a rhizomatous or spreading root system characteristic of *H. fulva*; however, most modern daylily hybrids develop a compact fleshy clump of roots (Figure 2, page 4).

Forms

Modern day hybridization has resulted in daylily blooms in a variety of forms. The terms used to describe the frontal view of the bloom are *circular*, *triangular* and *star*. The side view is described as *flat*, *flaring*, *recurved*, *trumpet*, *double* or *ruffled*.

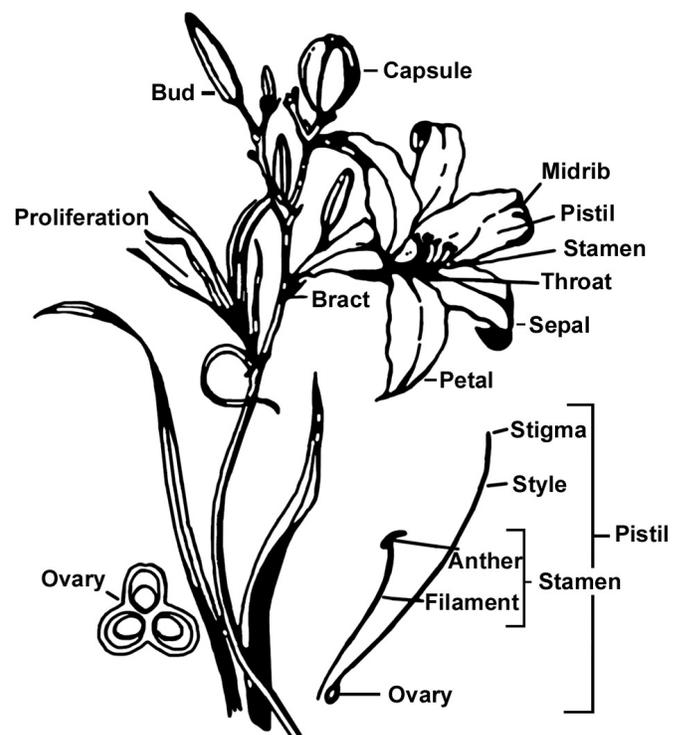


Figure 1. Diagram of a daylily, including flower anatomy.



Figure 2. Daylily root systems vary from somewhat fleshy to a more swollen type.

Circular — The flower is round in appearance and the segments generally overlap.

Triangular — The segments form a triangle.

Star — The segments are long and pointed. The flower looks like a three-pointed or six-pointed star.

Informal — There is no recognizable shape. Segment placement is irregular, widely spaced or floppy. This form is often called “Spider.”

Flat — Flowers are flat except the throat, which is concave.

Flaring — The segments arch out from the throat. The flaring side view most often accompanies the triangular front view.

Recurved — The segments flare, but the ends of the segments roll or tuck under.

Trumpet — Segments rise from the throat in an upward pattern rather than the usual outward pattern.

Double — These are blooms with more than six segments. The extra segments may number as many as 18 and come in many forms.

Ruffled — The segments have a ruffled or crimped appearance. Most ornamentation is called *ruffling*.

Color

Daylily flowers are presently available in numerous colors and combinations of colors. Terms used to describe these include:

Self — The flower petals and sepals are the same color or shade.

Blend — The flower petals and sepals are a blending of two colors, pink and rose for example.

Polychrome — The flower is a blend of many colors such as melon, pink, lavender and yellow.

Bitone — The petals and sepals differ in color shade and intensity.

Bicolor — The petals and sepals are different colors, *i.e.*, red and yellow.

Banded or Eyezone — A band of a different or darker shade of color forms at the juncture of the segments and the throat. This pattern is an “eye” or “eyezone” if the differing color is present on both the petals and sepals. It is called “band” when it occurs only on the petals. A *watermark* is a band-type marking. It is a wide strip of a lighter shade where the petal and sepal colors meet the throat.

Midrib — The color is a strong line of yellow, white or contrasting hues down the center of each segment.

Edged — This occurs when the segment edges are either lighter or darker than the segment color.

Cultural Information

Daylilies can be grown successfully in all areas of Georgia. They are frequently seen growing under adverse conditions; however, this doesn’t mean they thrive on neglect. Those who specialize in these plants are aware that nice foliage, quality flower and repeat blooming is dependent on proper culture.

Location

To achieve good growth and flowering, plant daylilies where they receive full sunlight for at least half the day. Many varieties grow quite well if they receive sun during the earlier part of the day and are partially shaded from the late afternoon sun. Daylilies perform well under filtered shade provided by tall pines. They produce abundant foliage in heavy shade but flower poorly. If flowers of certain varieties fade, wilt or burn in direct sun, move them to filtered shade.

Soil pH

A pH range of 6.0-6.5 is ideal for daylilies. This is considered mildly acid. An application of lime may be needed should the pH range fall below 5.5. A soil analysis is the means of determining the need and amount of lime to apply.

Soil Requirements

Daylilies will grow in a variety of soils ranging from light, sandy soils to heavy clays. Areas used for daylilies should be spaded or tilled deeply to improve the physical condition. Tilling relieves compaction and underlying hardpans. Both impede drainage. Do not plant daylilies in poorly drained soils. Where marginal drainage is a problem, elevate beds above ground level.

Planting Time

If necessary, daylilies can be planted any time of the year. The best time to plant them is early fall when soil temperatures have declined from high summer levels. Cooler soil temperatures favor root growth, encouraging early establishment of plants. Early spring planting is also recommended in Georgia.

Daylilies often are bought and transplanted during the flowering period. The advantage of moving during flowering is that color selection is possible at this time. Dig clumps with as many roots as possible. Handle them carefully to allow as much of the soil as possible to remain around the roots.

Regardless of when daylilies are transplanted, water them routinely to encourage new root growth and early establishment. Transplanted, blooming clumps require periodic watering to encourage root growth and to sustain continuous flowering.

Dividing Plants

Divide vigorous growing varieties every four to five years. Crowded clumps lose their vigor and flowering declines because of competition. Clumps are more easily divided if the soil is washed from the roots. Individual ramets (offshoots) with their roots intact can be observed, making separation easier. Decayed or broken roots are easily seen and much easier to remove when free of soil. Cut the foliage of the ramets back to 8-10 inches in length before planting.

Planting

Plant daylilies 18 inches to 24 inches apart to prevent crowding. Dig individual holes several inches wider than the root system and at least 12 inches deep. The soil should be worked into a friable condition before replacing it around the roots. Construct a cone-like mound of soil in the bottom middle of the planting hole. Set the plant with roots spread over the top of the mound and trailing downward. Adjust the height of the mound so the plant sits as deep as it grew originally. The original depth can be determined by the white leaf base indicating the underground portion. A safe rule is to set the plant so the point where roots and foliage meet is not deeper than 1 inch below the surface of the soil (Figure 3).

A quicker and more desirable landscape effect can be obtained by combining at least three ramets in each planting hole when digging clumps, dividing them and replanting.

Cover the roots carefully with soil. Firm the soil around the roots but do not pack it. Construct a small mound of soil around the outside of the planting hole with the remaining soil. This low, circular ring of soil

is called a *water ring*, and it aids in directing water toward the root system when irrigating the plant. Water thoroughly after planting and once or twice a week until well established.

Mulching

Mulching is a desirable practice in daylily culture. Mulching aids in water retention during hot summer weather, maintains cooler soil temperatures, reduces weed competition, and increases water penetration. Materials such as pine straw, pine bark, wood chips and decomposed leaves provide an effective mulch. A mulch should be 2 inches deep after settling.

Watering

Daylilies survive temporary dry conditions well due to the type and extensiveness of their root systems. Number of blooms, bloom size, overall vigor, and the ability of some varieties to repeat bloom is enhanced by irrigating plants during periods of low rainfall.

Weekly application of water during the growing season will promote good growth and flowering. Apply enough water at one time to wet the soil to 10 to 12 inches deep. One-half inch of water is required to wet sandy soils to this depth while $\frac{3}{4}$ to 1 inch of water is necessary to wet clay soils to a similar depth. Heavy clay soils may need watering only once a week to maintain proper moisture levels. Sandy soils may require water every four to five days to maintain adequate moisture. Inadequate moisture when flower scapes and buds are forming causes inferior flowering. Consequently, it is important to water plantings during this period if rainfall is lacking.

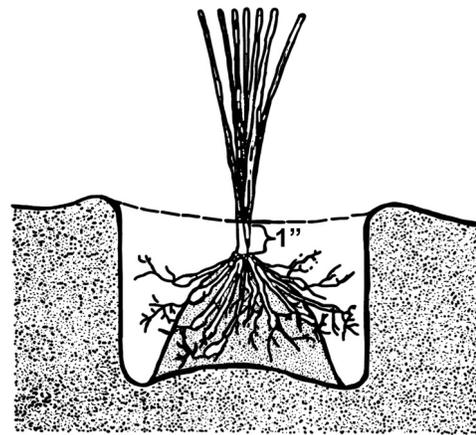


Figure 3. When planting daylilies, spread the roots over the soil mound and set with the crown an inch below the surface of the soil. Leave a slight depression for watering as you fill in the hole.

Fertilizing

Daylilies grow better when fertilized. They respond to a fertilizer analysis containing a moderate amount of nitrogen and high rates of phosphorous and potash. Analyses such as 5-10-15 and 6-12-12 supply such requirements. The first application is applied in the early spring just as new growth commences. A rate of 2 pounds per 100 square feet of area is suggested. A second application during the growing season is recommended; however, there is no research to substantiate the exact timing of the second application. Most daylily growers make a second application of fertilizer during midsummer using the 2 pound rate per 100 square feet.

Plan far enough in advance to adjust soil fertility levels of new beds properly. This is easily accomplished by submitting soil samples to the county extension office for analysis. Recommendations can then be made as to the proper analysis and amount of fertilizer to add to adjust nutrient levels prior to planting. The soil analysis will also reveal if lime is needed to adjust the pH, the type of lime to apply and the amount needed.

Note: When using complete fertilizer for daylilies, specify and purchase a premium grade. The premium grade contains minor elements. While minor or trace elements are needed only in small amounts, they are essential for proper plant growth.

Landscape Uses

Daylilies have been used in home landscapes for years. These plants are now being used more and more in commercial landscape situations because of their plant form, ability to provide seasonal color and ease of culture.

Daylilies have a number of functions in enhancing the overall landscape effect. For example, they are an excellent choice for tying down and blending struc-

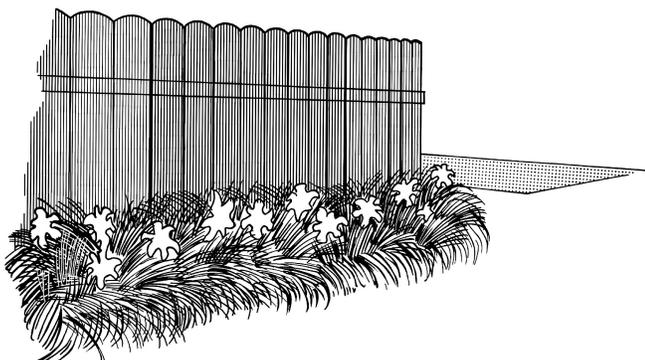


Figure 4. Tying down and blending a structure with the terrain.

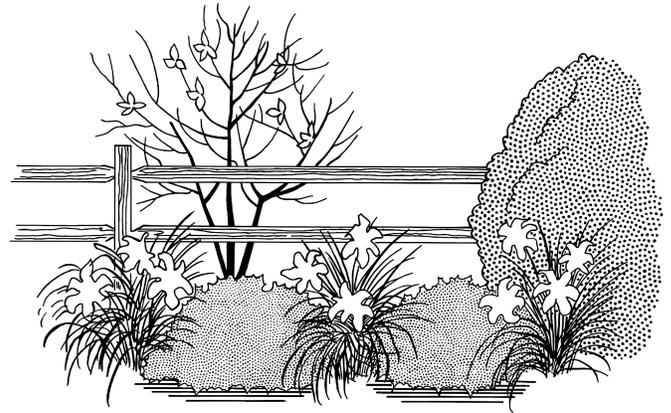


Figure 5. Border planting.

tures such as fences and steps with the terrain and relieving harsh horizontal and vertical lines (Figure 4).

Daylilies are integrated into border plantings to fill voids created by the initial use of small plants. They are purposely used in border areas to supply a contrast of plant form and seasonal color (Figure 5).

They are used to tie down and integrate statues with the landscape. Creative uses such as illustrated in Figure 6 provide a better composition than statuary used alone.

They are often used to unify and complete a planting by tying shrubbery groupings together (Figure 7).

Certain plants are chosen for accent use. In this respect, a clump or two of daylilies are often integrated into foundation plantings. Both color and plant form of the daylily achieve this desirable effect (Figure 8).

Plants have their practical uses as well as aesthetic ones. The use of plant material for erosion control is a common one in many landscape situations. Daylilies are a logical choice for controlling erosion on banks and provide an aesthetic bonus when in flower (Figure 9).

Daylilies are effective ground covers, reducing costly mowing. A single cultivar used in this fashion

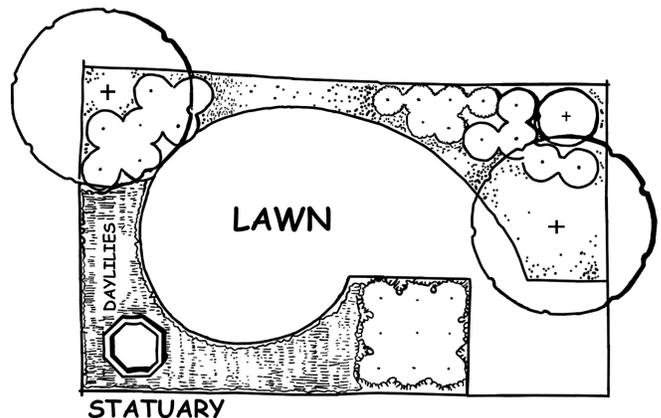


Figure 6. Daylilies used with statues.

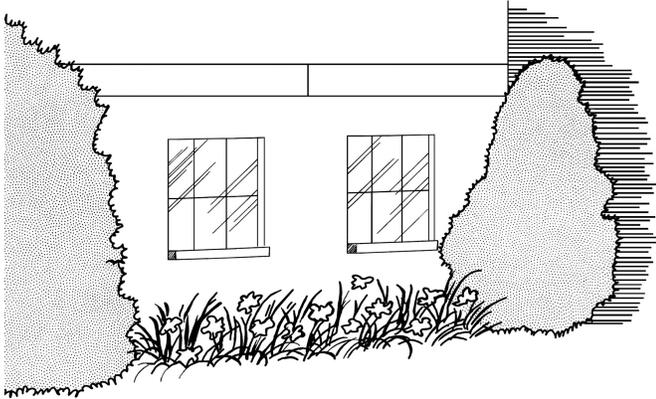


Figure 7. Unifying plant composition.

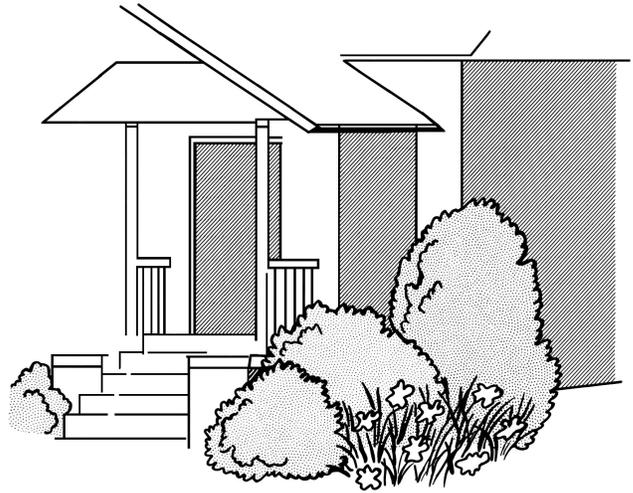


Figure 8. Daylilies in foundation plantings.

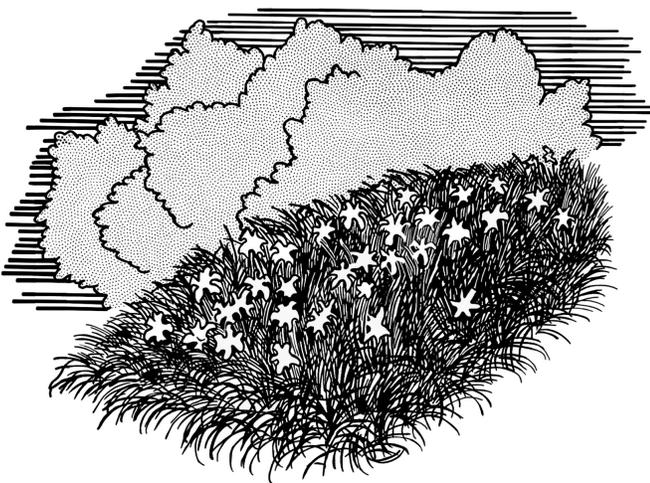


Figure 9. Erosion control (banks).

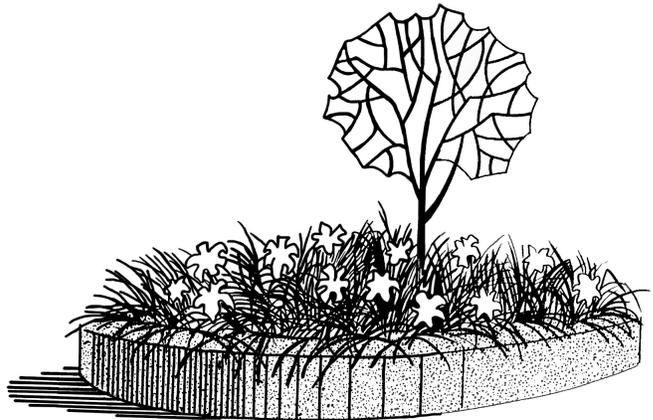


Figure 10. Ground cover use in large beds.

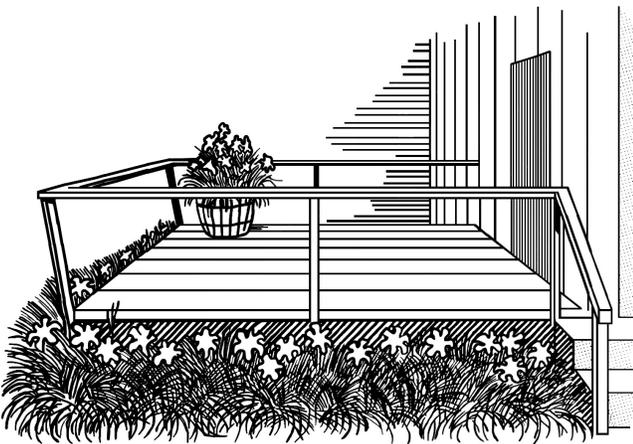


Figure 11. Tying down decks.



Figure 12. Container plant for accent use.

can be breathtaking during the blooming period (Figure 10).

Plant material is often chosen to repeat certain structural lines while tying the structure to the surrounding terrain simultaneously. This function around decks is handled nicely with daylilies (Figure 11).

Container plants on decks and patios as well as around pools are colorful and fashionable. Large clumps of daylilies are excellent plants for this use. Wise gardeners choose daylily varieties for container use that repeat their blooming cycle during the growing season (Figure 12).

Daylilies are appropriate for accent use and provide nice naturalizing effect when massed along terraces, around swimming pools, on the edge of ponds, or along driveways. (Figure 13)

Most daylily varieties fit into two size categories: short scapes and short foliage or tall scapes and tall foliage. Essentially, all colors are represented in each of these two groups. The short plants are ideal for border plantings in front of small shrubs. The height of the foliage and flower scape is an important consideration for locating daylilies in the landscape.

Plan daylily plantings to display their best landscape appearance. For example —

- Use bright colored flowers in front of a shrubby background.
- Flowering shrubs can be used as a background provided colors don't clash or if plants don't bloom at the same time.
- Deeper colored flowers including reds and purples need brighter backgrounds such as lightly colored walls and fences that reflect light. This type of lighting illuminates the darker blooms.
- light colored flowers show up better at a distance than darker ones. Consider this phenomenon when planning beds to be viewed from a distance.
- Use bitones and strongly patterned flowers against a neutral background to display and emphasize their beauty.

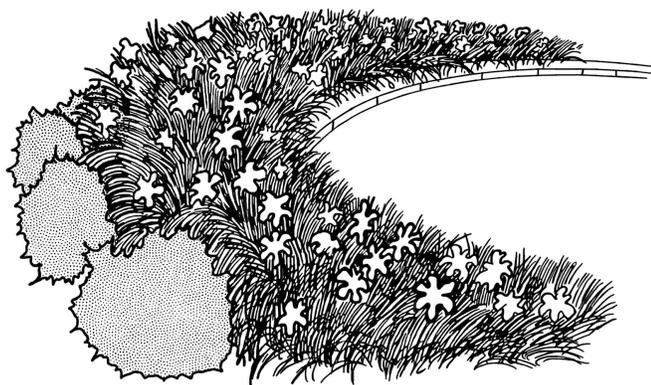


Figure 13. Naturalizing effect.



Figure 14. Small blister-like protrusions on daylily flower buds are the result of aphid injury during the early stages of bud development.

Pests

Those growing only a few daylilies are not routinely bothered with insect or disease problems. It is likely that some pest problems will be encountered on occasion when larger numbers of daylilies are grown in close proximity. Daylilies are no different in this respect than other crops.

Aphids, referred to as plant lice, feed on both daylily foliage and flower buds. These soft-bodied insects have sucking mouth parts and feed on the cell contents. Aphids are more of a problem during the cool spring period. In addition to the insects themselves, cast-off skins (resulting from molting) indicate their presence. A serious infestation can cause foliage damage and mar the appearance of flower buds. (Figure 14)

Thrips can be a serious daylily pest. They are small winged insects about the size of an exclamation point (!). They find their way into plant crowns and bloom buds prior to opening. Blooms can be misshapen or discolored due to the rasping type of feeding injury.

Spider mite damage of daylily foliage can go undetected until severe because the pest is hard to see. Russeting or speckling of the foliage is caused by mites feeding on the chloroplast of cells. A serious infestation can reduce the vigor of plants appreciably. Leaves may lose their characteristic green color, turn tan, and even die under more severe mite pressure.

Nematodes can cause loss of vigor and severe decline of daylilies. Root-knot nematodes are the predominant type found attacking daylily roots. Nema-

todes are generally more of a problem on former cropland (especially soybean and tobacco land) that has been re-used for residential use.

Under some circumstances, it is necessary to use chemical sprays or drenches to control insects, diseases and nematodes. Visit your local county extension office for information regarding the specific chemicals used to control these pests.

Cultural Problems

Cultural problems associated with daylilies include poor drainage and planting too deep.

Poor drainage decreases or depletes soil oxygen levels, affecting the growth of roots. Oxygen is necessary for root growth and absorption of both water and nutrients. Harmful water molds capable of attacking and killing roots are more prevalent in poorly drained soils. These disease organisms are a direct result of poor drainage and can often cause problems. When plants are over-watered.

Planting daylilies too deep results in loss of vigor, reduced flowering and plant decline. Leaves may yellow or brown at the tips; whole leaves may be affected similarly.

Propagation

Daylilies are most often propagated by division, but they can also be propagated by proliferations (offsets obtained from flower stalks) and by seed.

Seeds of daylily are ready to harvest when pods turn brown and start to split. Seeds germinate in approximately two weeks. Freshly harvested seeds are planted in pots or flats in any suitable germinating mixture such as vermiculite or a commercially available soilless mixture containing peat moss, vermiculite and bark, styrofoam beads or perlite. Seeds are covered to a 1/8- to 1/4-inch depth. Germinating containers are placed in partial shade to prevent them from drying out. Seedlings are transplanted to flats or pots when they reach 4 inches in height. They are spaced 2 inches apart in flats or transferred to 3-inch pots. Seedlings can be transferred to nursery beds when they develop adequate roots and are from 4 to 6 inches tall. It usually requires two years for plants to develop and flower from seeds.

Daylilies are most often propagated by dividing the parent clump. Divisions can be expected to flower the first year following transplanting and exhibit the exact flowering characteristics of the parent. Division is accomplished in the early fall or just prior to the time growth begins in late winter/early spring. Lift the

entire clump by making several deep cuts on the outside boundary of the root system. Dig far enough out from the center of the plant to avoid damaging the roots. After lifting, shake and wash the soil from the roots. The clump can then be divided by carefully pulling the individual fans apart while retaining as many roots as possible. Tops of the individual divisions are cut back to 8 to 10 inches in length prior to planting.

Daylilies are also propagated on a commercial scale by tissue culture. In fact, many plant breeders use tissue culture labs to multiply breeding stock or to bulk up a stock block, which is then propagated by division. This can be especially helpful for propagation of the tetraploid varieties, which are very slow to multiply by division. Plants propagated by tissue culture tend to develop more shoots (bibs), which leads to a faster rate of multiplication. The difference in multiplication rate usually disappears after one or two generations. Tissue culture liners are generally more expensive than bibs (division). As such, the most economical route may be to use tissue culture liners to establish stock plants and replace the stock plants every three or four years.

Small plants sometimes develop on the flower scape. These are called proliferations and are easily removed and rooted to form a new plant (Figure 15). Proliferations are removed as root initials begin to emerge. When planting the proliferations, place enough soil around the base to encourage roots to continue growth. Watering routinely encourages root growth.

Hybridizing

Those who are interested in amateur hybridizing will find daylilies easy to work with. Flower parts are large and easily found, and the actual mechanics of crossing are quite simple. Essential flower parts for

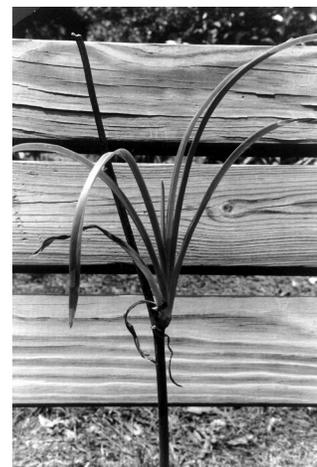


Figure 15.
Proliferation.

pollination include the pistil (female part) and anther (male parts). There are generally one pistil and six anthers in each daylily flower. Pollination consists of applying pollen from the anther of one flower variety onto the tip of the pistil (stigma) of the flower of another variety.

Cross pollination (crossing) is accomplished as soon as possible after flowers open in the morning. This prevents insects from mixing pollen, and the stigma is more receptive at this time. Remove the anthers from the flower to be pollinated. Next, rub the pollen from the anther from the male parent onto the stigma of the pistil. Petals and sepals can be removed to prevent further pollination by insects.

Small seed pods begin swelling a few days after pollination. As seed pods ripen after several weeks, they turn yellowish and then brown. Pods are gathered just prior to or as pods begin to break open at the top. Seed are planted immediately after gathering. Most growers plant seed in flats or in beds prepared outdoors.

Daylily hybridization on a more professional level is much more complicated than making simple crosses. It involves pollen storage, inline and out-breeding, and planned crosses for selected characteristics. Detailed record keeping and labeling are required in the process. Those who have a desire to become more involved in hybridizing daylilies should plan more in-depth study and obtain more precise literature on the subject. The American Hemerocallis Society is one source. Texts on plant breeding are also available from various textbook publishers.

Useful Links on the Web

A great variety of information about daylilies can be

found at the website of the American Hemerocallis Society (www.daylilies.org). In addition to detailed descriptions of important botanical terms pertinent to daylilies, the website lists plant images, culture information and various resources.

Summary

Vast improvements in the quality and beauty of daylilies have occurred since the late 1930s. These improvements have been the result of continuous breeding during this period and the evolution and breeding of tetraploid plants. Tetraploid daylilies have double the normal chromosome number — 44 chromosomes. Tetraploids exhibit larger flowers and more intense flower color. These daylilies are more vigorous, leading to improved strength of leaves, scapes and flower substances. One of the most important points regarding the evolution of tetraploid daylilies has been the improved breeding potential leading to exceptional cultivars.

Homeowners are now able to select and buy daylilies with a wide range of flower colors and hues. Coloration of most of the newer cultivars can be described as spectacular. Improved branching of scapes and higher bud count have become more commonplace in today's hybrids. One of the newest improvements has been breeding for the characteristic of repeat flowering. This factor enables certain cultivars to have more than one cycle of bloom within one growing season. Fragrance of flowers and ability of flowers to last longer (extended bloom) will be more commonplace in the future. The characteristics mentioned, along with the natural beauty of daylily flowers, makes growing these plants more and more enticing.

Learning *for* Life

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service, the University of Georgia College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability.

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