



FactSheet

Extension

Ohio State University Extension Fact Sheet

Horticulture and Crop Science

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Growing Hardy Bulbs

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Hardy bulbs provide some of the earliest bloom in spring gardens. Growing and using them successfully requires a knowledge of life cycle, cultural requirements, and use. "Hardy" refers to their ability to withstand low winter temperatures and bloom year after year.

A true bulb is defined as a modified, underground stem, usually surrounded by scalelike, modified leaves, and containing stored food for the shoots enclosed within. The scales are held together by a hardened stem tissue, known as the basal plate (at the base of the bulb). Tulip, daffodil, hyacinth, and lilies are examples of true bulbs. Crocus, thought by many to be a bulb, is actually a corm. This is a mass of fleshy tissue with a bud on the top surface. This tissue disintegrates as the stored food is used to produce roots and shoots. A new corm forms on top of the old one's remains. Bulbs and corms are living structures and require careful handling even while in a dormant state.

In general, hardy bulbs produce foliage and blooms in spring. They are in a dormant (resting) state over the summer months. Low temperatures are required to break dormancy so growth may resume in fall and early winter.

Good quality bulbs produce good bloom. Usually the larger the bulb, the better it will bloom. Beware of "bargain" bulbs that are often too small to bloom the first season. Bulbs should be firm, heavy, and in good condition. The tunic (skin) should be smooth, of good color, and free from injury. The basal plate must be intact.

Fall Planting



Crocus vernus
Spring Crocus



Chionodoxa luciliae
Glory-of-the-Snow

Bulbs can be obtained from many sources in the fall. Planting can occur from mid-August until the soil freezes. Daffodils, however, are best planted in September or early October because they require a longer period for root development. In the event that bulbs obtained through a mail order source arrive at an inconvenient time for planting, they should be stored in a cool and well-ventilated area.

Choose a planting site in full sun, but with protection from the hottest midday summer sun. Planting under or near large deciduous trees that cast filtered shade works well. Plants in full sun will bloom earlier than those in partial shade. A few plants that withstand partial shade include daffodils; Triumph, Parrot, and Fosterana tulips; some hardy lilies; some Crocus; Siberian squill (*Scilla*); checkered lily (*Fritillaria*); and some windflowers (*Anemone*).

Soil of a medium sandy-loam texture is ideal because it provides good aeration and drainage. Bulbs must not be planted in areas that do not drain well, or they will perform poorly or rot. If soil is a heavy clay, mix it with one-third to one-half organic material such as peat moss, compost, or aged bark. Raised beds also provide good drainage. Soil pH should be between 6.0 and 7.0.

Work soil 12 inches deep; loose soil below the bulb is important for good root development. Incorporate three pounds of a complete fertilizer (such as a 5-10-10) per 100 square feet as you are preparing the soil.

Recommended planting depths are given to the bottom of the bulb. For hyacinths, plant six inches deep; tulips, six inches or deeper; and daffodils, six to eight inches deep. Smaller bulbs in these groups and the minor bulbs are planted shallower. Large bulbs should be spaced four to six inches apart; small bulbs one to two inches. For a greater effect, plant in clumps or irregular masses rather than singly.

Once planted, replace half the depth of soil, then water. Finish covering with soil and water again. If fall weather is dry, water as needed to promote good root development. Mulch may be placed over newly planted areas once the soil has frozen to a depth of one to two inches. This keeps soil frozen and prevents alternate freezing and thawing, which may cause the soil to heave and injure newly planted bulbs.

Mulch can be placed over bulbs planted very late in the season to extend the root development period. The mulch can also be used to keep prepared soil from freezing. This method can be used for bulbs, such as hardy lilies, that cannot be obtained until very late in the season. After planting and as soon as soil has frozen to a depth of one to two inches, replace mulch.

Some bulbs are bothered by rodents, particularly squirrels, chipmunks, and mice. They dig and feed on (or

store) tulip, Crocus, Chionodoxa, and lily. Daffodils and hyacinths are not bothered. If rodents are a problem, and only a few bulbs are to be planted, consider enclosing them in hardware cloth boxes (use 1/2 inch mesh), or lay a sheet of hardware cloth over the planted area before replacing soil. Bulbs may also be dipped in Ropel®, a taste repellent, before planting to repel rodents.

In spring, rabbits feed on tulip and lily foliage. Chicken-wire enclosures or some of the taste repellents work fairly well.

Spring Care

Further care is required in spring. When bulb foliage has emerged two to three inches and is making rapid growth, hand weed to eliminate competition. After spring cultivation, replenish mulch, if needed, to a two to three inch depth. This conserves moisture, suppresses weeds, and prevents mud splash to blooms.

Water is needed especially during bud and foliage expansion. If rainfall is insufficient, apply additional water. Use a soaker hose or otherwise apply water at the soil line, rather than overhead sprinkling.

Of all the bulbs, tulips are "heavy feeders" and require fertilization as foliage emerges and again after flowering. Fertilize other bulbs after flowering to support foliage and increase bulb size. Use a complete fertilizer, such as a 5-10-10, or 6-12-12, at two pounds per 100 square feet.

Flowers may be cut for indoor use when just past the tight bud stage. Cut in the morning, plunge stems in deep water, and store cool (as low as 40 degrees F) and dark for several hours or overnight to harden. If so treated, blooms may last up to seven days indoors.

As bulbs finish blooming, remove faded blooms to eliminate seed set that reduces bulb growth. Maintain foliage for six weeks for good bulb growth and rebloom the following season. Do not cut or braid foliage, but allow it to die down naturally. Foliage can be removed when it has yellowed, fallen over, and comes loose when slightly tugged.

Over the years, flowers may become smaller or less abundant, indicating that bulbs may need to be divided. After foliage dies back completely, dig bulbs with a spading fork and separate them. Bulbs can be respaced and replanted right away or stored to replant in the fall. To store, remove all soil, air dry, place in a mesh bag (such as an onion bag), and hang in a cool (65 to 70 degrees F), dark, well-ventilated area.

Daffodil



Narcissus, commonly known as daffodils, encompass 12 divisions with remarkable range in size, color, and form. Often, bulbs are sold as single, double, or triple nose size. As a group they are easy to grow, multiply quickly, and may need division about every four years. They are wonderful in naturalized settings and combine well with minor bulbs. Bulbs are toxic and not attractive to rodents.

Tulip



Tulips grown in central Ohio are often treated as annuals because bulbs may not perennialize due to hot summers. Bulbs may be planted deeper (to 12 inches deep) to remain cool. At this depth, bulbs multiply less but produce a good size bloom for a few years. Deep planting may also lessen Botrytis blight problems. Generally, tulips are not planted in beds with other bulbs. Tulips are classified as early, mid-season, or late, providing color over four to five weeks each spring. These classes are:

- Early- Single Early and Double Early
- Mid-season- Mendel, Triumph, and Darwin Hybrid
- Late or May- flowering-Darwin, Lily-flowered, Cottage, Rembrandt, Parrot, and Double Late or Peony-flowered

There is also a botanical or species class, with subclasses Kaufmanniana, Fosterana, and Greigii. Tulips in this class bloom before the Early group.

Species tulips are easily naturalized, and quite varied in bloom and foliage characteristics. They are more permanent than the hybrids, though 'Golden Appledorn,' 'Orange Emperor,' and 'Golden Oxford' (Darwin group) are also fairly permanent.

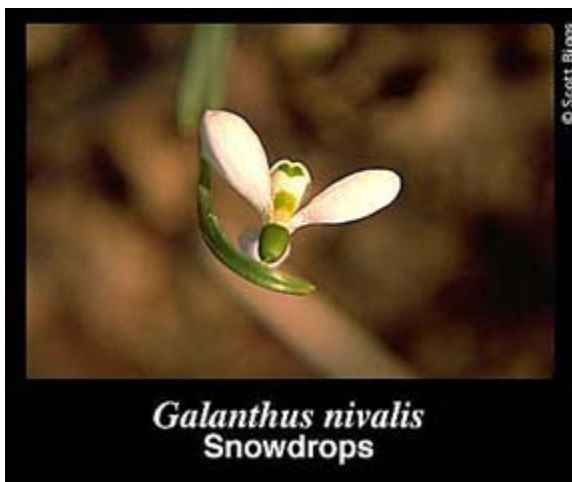
One tulip disease of note is Botrytis blight, commonly known as "tulip fire." This fungal disease spreads quickly in warm, humid, wet springs. First, leaf tips yellow and shrivel, followed by spots near leaf margins that increase and merge. Spots appear on petals followed by rotting and a mushy, gray mold. Badly affected plants should be destroyed. Preventive measures include planting in a full sun, well-ventilated site, planting where tulips have not grown for three to four years, and examining and discarding bulbs that show tiny, hard black specks (overwintering structures for the disease) under the tunics or on the basal plate.

Hyacinth



Hyacinth blooms are very formal and fragrant. Bulbs are graded in centimeters, from exhibition size (19 cm) to miniatures (14 to 15 cms). They bloom at the same time mid-season tulips are blooming. Hyacinths are planted in small, irregular groups for best effect. They are excellent for cutting and easily forced in pots for indoor use. The bulbs are toxic and not attractive to rodents.

Minor Bulbs



The "minor bulbs" include Muscari, Crocus, Scilla, Anemone blanda, Iris reticulata, Galanthus, Chionodoxa, and Eranthis as well as others. All are small, short plants and are used in informal, massed plantings for greatest effect. They are often naturalized, used in rock gardens or serve as groundcover for larger bulbs or shrub plantings. Mulch these plantings to avoid mud splashed blooms.

Muscari, or grape hyacinth, is perhaps the most common minor bulb. They are noted for fragrance, long-life, and ability to freely self-sow. They grow to a six-inch height, bloom in April, and are good in combination with daffodil. Clumps of foliage may appear in the fall.

Lilies



Lilies stand apart from other hardy bulbs in that they have a much longer bloom period and they are tall, upright growers. They also provide an all-season floral effect if various species, hybrids, and cultivars are selected. There is great variety in height, size, form, and colors. Most lilies are best used in informal or semiformal surroundings and are best displayed in masses against a background.

Lilies have site requirements similar to other hardy bulbs, but need added protection from strong winds. They prefer their flower heads in sun but a cool root environment, so a year round mulch or a ground cover planting of creeping phlox, coralbells, candytuft, or periwinkle works well.

There are stem-rooting and base-rooting lilies. Stem-rooting bulbs root along the new annual stem above the bulb, and should be planted more deeply than base-rooting bulbs. Plant stem-rooting bulbs eight to ten inches deep and base-rooting bulbs four to six inches deep, measured to the top of the bulb. Support may be required for taller lilies. Insert a stake at planting to avoid later injury to the bulb or root system.

In spring, fertilize plants when new growth is six to ten inches in height and again as flower buds develop. Use a slow release form of nitrogen (organic forms such as cottonseed meal or dried blood are good) and a high potash fertilizer such as a 0-10-10, using one to two pounds per 100 square feet in spring and two to four pounds per 100 square feet later as buds develop. Lilies do not do well in drought and should be watered as needed throughout the season. Deadhead as blooms fade and cut stems to four to five inches after foliage is killed in the fall. This marks their location.

Established lilies that are growing well should not be disturbed if at all possible. Some bulbs increase so rapidly, however, that division may be required every four or five years. If an excessive number of thin, crowded stems and few blooms becomes evident, it is a sign to divide the bulbs. Division is best done in fall, before the weather cools considerably and after growth ceases.

The Easter lily, *Lilium longiflorum*, is perhaps the most familiar true lily. After blooming as a potted plant, deadhead and maintain the foliated stem in a sunny, fairly cool location, and water regularly. It can be planted outside in mid-May in central Ohio to bloom in mid-to-late summer in succeeding years (this bulb is not considered reliably hardy in Ohio).

The three diseases that can be problematic for lilies are lily mosaic, Botrytis blight, and basal rot. Lily mosaic, a virus disease spread by aphids, usually produces streaking or mottling of the leaves, followed by distortion. Affected plants produce few flowers, and they may be deformed, or buds may fail to open properly. Botrytis blight is a fungal disease that begins on lower leaves and ascends the stem. Orange-brown spots spread and merge together, and spores form a gray mold. If it infects the flowers, a messy decay results, similar to tulip fire. Basal rot, also caused by a fungus, can be serious, infecting both roots and bulb. Fortunately, hybrids and species vary in their susceptibility to this disease. Infected lilies simply disappear or

plants may emerge later in spring, growth is stunted, and foliage may yellow and die prematurely. Contact your local Extension office for disease management ideas.

Below are lists of lilies considered "easy" for beginners and those suitable for container culture.

- **Easy for Beginners:** *Lilium martagon*, *L. regale*, 'Black Beauty,' 'Black Dragon,' 'Bright Star,' 'Enchantment,' 'Sterling Star,' Bellingham Hybrids, Golden Clarion Strain, Citronella Strain.
- **For Container Culture:** *Lilium auratum*, *L. formosanum*, *L. longiflorum*, *L. pumilum*, 'Black Dragon,' 'Cambridge,' 'Dukat,' 'Star Gazer,' Fiesta Hybrids, Jamboree Strain.

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