



Spring, Summer & Fall

Bulbs

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The term "bulb" is often used to describe not only a true bulb, but corms, rhizomes, tubers and tuberous roots as well. While horticulturists like to be technically correct when discussing various plants, most home gardeners do not worry about being that precise. This publication will use the generic term "bulb" for general information. Home gardeners need to be aware of differences in plant structures when determining a specific plant's culture. The following definitions may be helpful.

Bulb - An underground storage structure consisting of a short stem and fleshy scale leaves surrounding a bud. The scales are attached to a tough flat disc or basal plate. Roots arise from this basal plate. Most bulbs have a covering of dry leaves called a tunic. Tulips and lilies are examples of true bulbs.

Corm - Very similar to true bulbs. The swollen stem base acts as the food reserve and the buds are generally found on the surface of the corm. Crocus and gladiolus are common corms.

Tuber - An enlarged underground stem with latent buds from which the plant emerges.

Tuberous root - An enlarged underground root with buds located near the collar or base of the stem.

Rhizome - An enlarged underground horizontal stem that is generally thinner and more elongated than tubers. Generally located at or just below soil level. Tall bearded iris are familiar plants with rhizomes.

Hardiness

Bulbs can be classified as tender or hardy. Hardy bulbs will tolerate, and often require, periods of cold temperature to produce reliable flowers. Tender bulbs will not tolerate cold temperatures and need to be lifted and stored before cold weather damages them. Hardiness is affected by variations in climate in a particular area. Some tender bulbs may in fact overwinter if the season is mild. Because the climate is unpredictable, all tender bulbs should be lifted in fall before the soil freezes.

Bloom Season

When people hear the word bulb, they immediately think about spring blooming bulbs like narcissus and tulips. However, a wide variety of bulbs produce a display in the garden from very early spring until late fall. Bulbs generally bloom in a predictable sequence. For example, crocus bloom earlier than narcissus. The sequence may remain the same from season to season, but the exact date of bloom will be affected by weather conditions in a particular location. A cool spring may delay bloom for two or more weeks; likewise, an unusually warm spring may induce early flowering. The following are general guidelines for bloom dates. Numbers in the month brackets refer to the approximate weeks when bloom is expected.

Hardy Bulbs, Tubers, and Corms

Botanical name/

Common name

Period of bloom (*by week number*)

	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
<i>Allium spp.</i> Allium		3,4	1-4	1,2			
<i>Anemone blanda</i> Greek Anemone	4	1-4	1				
<i>Brodiaea spp.</i> Brodiaea				3,4	1		
<i>Camassia spp.</i> Camassia			2-4				
<i>Chionodoxa luciliae</i> Glory-of-the-snow	3,4	1					
<i>Colchicum autumnale</i> Autumn Crocus							1-3
<i>Crocus spp./hybrids</i> Crocus	3,4	1					
<i>Endymion hispanicus</i> Spanish Squill			1-3				
<i>Endymion non-scripta</i> Bluebells			2,3				
<i>Eranthis hyemalis</i> Winter Aconite	2-4						
<i>Erythronium spp.</i> Dog-tooth Violet, Trout Lily		3,4	1				
<i>Fritilaria imperialis</i> Crown Imperial		3,4	1				
<i>Galanthus spp.</i> Snowdrop	2-4						
<i>Hyacinthus orientalis</i> Hyacinth		2-4					
<i>Lilium</i> Asiatic hybrids				1-4	1,2		
<i>Lilium</i> Aurelian hybrids				2-4	1-4		
<i>Lilium</i> Oriental hybrids					4	1-4	
<i>Lycoris squamigera</i> Lycoris						3,4	
<i>Muscari armeniacum</i> Grape Hyacinth		1-3					
<i>Puschkinia scilloides</i> Puschkinia		2,3					
<i>Scilla siberica</i> Siberian Squill	4	1-3					
<i>Tulip spp./hybrids</i> Tulip		2-4	1				

In some cases the actual flowering period varies from cultivar to cultivar. Weather conditions affect the length of bloom display. Spring blooming bulbs will typically last longer if the weather remains cool. Hot spring temperatures dramatically decrease the length of display. This often happens in Kentucky and generally shortens the expected display from tulips. Summer display of lilies may be affected by extreme heat or drought.

Planting

Soils—Most bulbs will tolerate a wide range of soil conditions. They generally do best in soils with a pH range of 5.5 to 6.5, although some, such as hyacinths, do better in a slightly more acidic soil. In general, soil type is not as important as soil drainage. Avoid planting in soils with poor drainage because bulbs will not reach maximum growth potential and often rot.

Location—Most bulbs prefer a full sun location. Spring blooming bulbs can be planted under the canopy of deciduous trees. These bulbs generally bloom and complete most of their growth cycle before trees fully leaf out.

Planting Depth—Bulbs and corms are generally planted at a depth equal to two to three times the diameter of the bulb. Some exceptions include stem rooting lilies, which need to be planted a little deeper, and the Madonna Lily, which is planted just below the soil surface. Soil type also affects planting depths. Bulbs should be planted deeper in sandy soils than in clay soils.

Planting depth for rhizomes and tubers is more specific to the particular plant. Iris rhizomes should be planted just at the surface of the soil while dahlia tubers must be planted deeper.

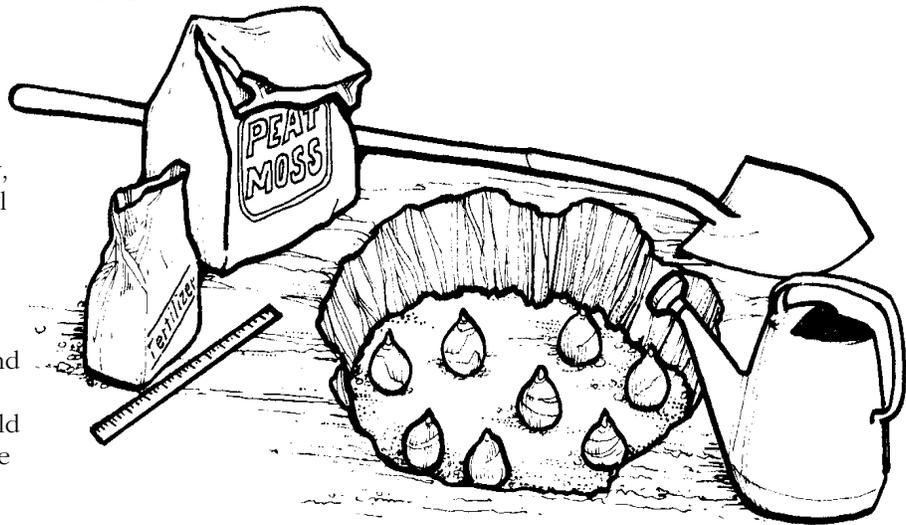
Planting Time—Bulbs generally grow in a cycle. At planting time they begin to produce a root system. Spring blooming bulbs should be planted early enough in

the fall to allow enough time for this root system to be produced before cold soil temperatures reduce plant growth. Some hardy summer flowering bulbs, such as lilies, can be planted in fall or spring. All tender bulbs should be planted in spring after all danger of frost has passed. Generally, bulbs are only available for sale at their proper planting time. For example, tulip bulbs are not available in spring and dahlias aren't offered in fall catalogs.

Planting Techniques—Bulbs can be planted individually or in groups. The correct spacing depends on the specific bulb. To produce a uniform display, plant all the bulbs of a specific cultivar at the same depth.

Some tender bulbs, such as tuberous begonias, dahlias, and caladiums, will produce a display sooner if you start them indoors in containers and then transplant them to the garden after danger of frost. In some cases, you can “sink” the containers in the ground.

Some plants such as amaryllis and agapanthus can be kept in containers year round. This technique will be discussed more on page 6.



Break up and loosen soil to a depth of 10 inches. If the soil is mostly clay, condition it with peat moss or other organic material. Plant tulips and other large bulbs 8 inches deep, spaced 6 inches apart. Cover bulbs half way with more conditioned soil and water thoroughly. Add more soil until bulbs are completely covered, and water again.

General Maintenance

Watering—You should water all bulbs thoroughly at planting time. This not only helps to establish good contact between soil and bulb, but also helps to initiate root growth as soon as possible.

Generally, rainfall will supply enough moisture during the growing season, but all bulbs should be watered during periods of drought.

Dead heading—Remove declining blooms to prevent seed set. Seed set reduces the production of storage materials that are necessary for good bulb growth, which in turn affects blooming next season.

Fertilization - Most bulbs do not require a fertilizer application at planting. Although it is not necessary, applying bone meal may be beneficial in some soils. Contrary to what some bulb books may tell you, most bulbs should be fertilized with a complete fertilizer such as 10-10-10 at a rate of 1-2 lb/100 sq ft when foliage is emerging in spring. Later application of fertilizer, however, can promote certain disease problems.

Container grown plants require more frequent fertilization during their active growing season because nutrients that are leached from containers need to be replaced. You can use any water soluble, complete fertilizer for container plants. Follow label directions for correct dilution rate.

Care of foliage— Foliage should be allowed to die back naturally. After plants have bloomed, foliage acts as a factory to produce all sugars necessary for bulb vigor. If you remove the foliage prematurely, you risk destroying bulb vigor. Remove as little foliage as possible when cutting flowers for indoor use.

Propagation

Seed— Although bulbs produce seed, propagation of plants by this method is usually left to plant breeders. It can take up to six years to produce a blooming plant from seed. As mentioned, it is generally best for bulb vigor to remove declining blooms before seed is set.

Offsets— This is a general term referring to bulblet or cormlets that can be severed or broken off from the mother bulb. Individual size of the offsets will determine how many growing seasons will be necessary before bloom size is reached.

Bulbils— Some bulbs, such as many of the lilies, will produce aerial bulbils in leaf axils. Under favorable conditions these “miniature bulbs” will grow and produce a flowering-size bulb in two or three years.

Division— After several growing seasons, bulbs like narcissus may have produced enough offsets to become crowded. This crowding reduces bulb vigor, which is apparent by a decrease in number or size of blooms. Reduced number or size of blooms signals that bulbs should be divided. Lift and divide bulbs when they are dormant. August is generally considered the best time to divide spring blooming bulbs. Summer blooming bulbs are

generally divided after foliage begins to die back. Fall blooming bulbs, like *Lycoris*, can be lifted and divided after foliage dies back in the spring.

Tender bulbs can be divided in fall before they are stored for the winter or in spring before they are planted. Tender tubers such as dahlias are more easily divided in spring. These tubers produce eyes at the base of the stem. It is much easier to see dahlia eyes in the spring.

Storing Tender Bulbs

You should dig tender bulbs in the fall before the soil freezes. There are basically two ways to store bulbs over winter. Some bulbs like gladiolus and ismene can be cured as you would onions and stored dry. To do this, dig bulbs and remove excess soil and foliage. Spread bulbs out in a dry area that has plenty of air circulation and allow bulbs to cure. After curing, remove any dried foliage or excess stems. Dusting with a fungicide is not absolutely necessary but can be done at this time. Store bulbs in any container (potato sack, paper bag with holes punched in it) that will allow adequate air circulation. Place containers in an area with good air circulation and where the temperature will not drop below freezing.

Other tender bulbs, such as dahlias, will not tolerate dry storage because the tubers will desiccate. You should dig these plants before the first expected killing frost and remove all excess foliage and soil. You can hose off the tubers to remove soil as long as you allow them to dry adequately before storage. Generally, division is not necessary at this time. Cover tubers with dry peat moss, vermiculite or any other material that will still allow some air circulation. This covering will reduce desiccation. Boxes or paper bags are possible containers. These containers should

also be stored where temperatures will not drop below freezing.

Both storage methods require periodic inspections throughout the winter to make sure that none of the bulbs have begun to rot. Discard any bulbs that show signs of rotting.

Purchasing Bulbs

Bulbs are generally graded by size. If you wish to force bulbs into bloom indoors, then purchase only top size bulbs. Bulbs that are classified as bedding or have a smaller diameter may be quite satisfactory for the garden. Purchase bulbs from a reliable dealer. If an advertisement seems too good to be true, then it probably is. Advertisements for a very large number of bulbs at an incredibly low price usually indicate that small bulbs are being offered. These small bulbs may or may not produce blooms.

If you are purchasing bulbs at a local garden center choose bulbs that have no obvious bruising and feel firm and “heavy.” Bulbs that feel “light” by comparison may have dried out and will not likely produce a desirable plant. The tunic (like an onion skin) on true bulbs may not be intact. This does not indicate an inferior bulb.

Forcing Spring Bulbs

Forcing bulbs is one method of starting spring a little early indoors. Forcing bulbs to bloom when you want them too, rather than when they normally do, is possible because of the growth habits of most spring-blooming bulbs. Bulbs have a general growth cycle. In late summer most are dormant with little if any active root growth and no shoot growth. As soil temperatures begin to cool the bulbs begin root growth. This growth continues until cold temperatures stop or reduce to a minimum root growth. As tem-

peratures begin to rise in spring shoot growth begins, with flowering following fairly rapidly. After bloom, foliage continues photosynthesis and replenishes food stores in the bulbs. Offsets are being produced and formation of next year's flower buds is also occurring. As foliage begins to die back, the bulb returns to a dormant state and the cycle is ready to begin again. Forcing is simply manipulating this cycle.

Choosing bulbs— Most spring blooming bulbs can be forced into bloom. The most common choices are hyacinths, tulips, narcissus, grape hyacinth and crocus. (See table 1 for more choices.) Catalogs and garden center displays often indicate which cultivars and types of bulbs are more suitable for forcing. Choose only top size bulbs.

Containers— Almost any container can be used for forcing bulbs. Specially designed vases for forcing individual hyacinth bulbs are available. Paperwhite narcissus can be easily forced in a shallow container of water using pebbles for support. More extensive forcing projects are best done in clay or plastic pots that have adequate drainage holes.

Soil Mix— Bulbs for forcing should not be planted in ordinary garden soil. Potting mixes that are labeled potting soil should also not be used. These mixes are often no more than a fine form of peat moss. This type of material will hold too much moisture and often cause water-related disease problems. The most desirable mix is one containing equal parts of soil, sphagnum moss and perlite or vermiculite. Commercial "soiless" potting mixes can also be used.

Planting— Fill 3/4 of the container with potting mix. Spacing considerations that apply to planting bulbs in the garden do not apply when the bulbs are to be forced. Purchase enough bulbs to "fill" the container. Place tulip bulbs with the "flat" side facing the edge of the container. After you arrange

the bulbs, place additional media around them. Do not fill the container to the surface with the potting mix. The tops of tulip and narcissus bulbs do not need to be covered. The bulbs should then be watered in.

Cold period— All of the spring-blooming bulbs, with the exception of Paperwhite narcissus, must have a cold period of at least 3 months to initiate bloom. You can supply this cold period in a variety of ways. Potted bulbs can be stored in a refrigerator. This method is only practical if an extra refrigerator can be devoted to bulbs for a 3- to 4-month period. Pots in a refrigerator tend to dry out rapidly so check them periodically to ensure there is enough moisture.

Bulbs can be chilled in a cold frame. If you use this method make sure you open the cold frame on sunny winter days. Even when the outside temperature is under 40°F the inside of the cold frame can rapidly heat up, which can initiate early flowering.

A simple method involves chilling the pots under natural cold conditions outdoors. Dig a trench or pit in the vegetable or flower garden approximately as deep as the containers. Place pots in the trench or pit and cover with loose dried leaves, straw or sphagnum moss. Then cover the mound with plastic and anchor it with soil, bricks or rocks. The leaves, etc., act as a buffer zone. Bulbs will receive the cold temperatures they need but won't freeze. It isn't absolutely necessary to cover the pots with plastic, but it will make it much easier to remove the pots after the cold period has been completed. The length of the cold period needed depends on the specific bulb, and in some cases, the cultivar. The following table gives guidelines for some of the most common bulbs that are easily forced.

Common Name	Weeks of Cold
Crocus	15
Daffodils	15
Glory of the snow	15
Grape hyacinth	14-15
Hyacinth	11-14
Iris	15
<i>I. reticulata</i> ,	none
<i>I. danfordiae</i>)	14-20
Paperwhites	none
Tulip	15-17

Forcing— After bulbs have been chilled long enough, you can bring the pots indoors for forcing. Check the pots to see if the bulbs have produced an adequate root system. (Look to see if any roots are visible through the drainage holes.) The number of weeks it will take before the plants actually bloom depends on the environmental factors in the home, but the average is two to three weeks.

When you bring pots indoors clean off excess garden debris. Water pots thoroughly. Place pots in a cool area of the home (high light intensity is not important at this point). Leave pots in a cool location until active growth is visible. Take care not to over water. Once active growth begins you can move the pots to a warmer location that receives more light. Forcing bulbs slowly is more desirable than placing them directly in a bright, warm location. The quick transition from chilling to warm temperatures can sometimes "blast" the buds, which means everything moves too fast and the bulbs do not bloom. Because of the warmer indoor temperatures, flowers from bulbs that are forced indoors do not last as long as outdoor flowers. Forcing several containers of bulbs on a staggered schedule will extend the indoor display.

After-bloom care—

Forcing is hard on most bulbs. The easiest after-bloom care is pitching

the bulbs on the compost pile. If you wish to recycle these bulbs for the garden, after-bloom care is very important. The key to success is keeping the foliage actively growing as long as possible. Bulbs will need to be fertilized with a water soluble fertilizer. (Follow label directions.) After the foliage has died back naturally the bulbs can be planted directly in the garden or stored for later planting. If they do not perform well in the garden do not be disappointed. Forced bulbs are most useful for indoor enjoyment. By all means do not try to force the same bulbs the next season. It is very difficult to re-create the natural bulb cycle indoors. Most homes simply do not have the necessary light conditions to be successful.

Tender Bulbs in Containers

Some tender bulbs like amaryllis, agapanthus and callas can be grown in containers and kept from year to year. Although these bulbs do not require a chilling period they generally must have a resting or dormant period to induce flowering. The amaryllis are one of the easiest bulbs to keep from year to year. Guidelines for growing amaryllis are generally applicable to other tender bulbs as well.

You can buy amaryllis bulbs through garden catalogs, local garden centers and sometimes even grocery and other retail stores. They are relatively expensive but their ability to be kept from year to year makes the price well worth it.

Potting the bulbs— It is important that you choose the proper size container for the size of the bulb. Amaryllis bulbs like to be crowded. Do not allow more than 1 inch of space between the edge of the pot and the bulb. Containers should have adequate drainage holes.

Use a commercial potting mix to ensure adequate drainage. Plant bulbs with at least the top third of

the bulb visible above the soil line. Water thoroughly and place in a cool, not cold, location. Light intensity is not an important factor at this time.

Forcing the bulb— It is very important that the amaryllis bulb be forced slowly. Once potted and watered the bulb will begin to initiate root growth. If you place the potted bulbs in a warm, sunny location before the bulbs produce an adequate root system, you may have disappointing results.

After the root system has begun to grow and the leaf shoots or the flower bud begins to emerge, move the pot to a warmer location with a higher light intensity. Water as needed, do not overwater. As the flower bud continues to emerge you will notice that the bloom stalk may bend toward the light. Rotate pots every few days to keep stems as straight as possible. Staking may also be desirable, but take care not to injure the bulb.

Fertilization— Most commercial potting soil mixes contain few nutrients and thus you will need to fertilize containers regularly. Approximately every two to three weeks, apply a water soluble fertilizer at the recommended rate.

After-bloom care— Again, success with re-forcing an amaryllis from year to year depends on the foliage growth. Indoors, high light intensity is extremely important. Keep pots moist, but not wet. When blooms decline, remove bloom stalks.

Summer care— After danger of frost has passed move the potted amaryllis to an outdoor location. Choose an area that receives at least partial sun. Some people prefer to knock bulbs out of pots and plant them directly into the soil. This is fine, but sinking pots in the garden is also acceptable. Pots could also be left aboveground, but sinking pots into the soil helps to keep the pots from drying out quickly and from blowing over and damaging the foliage. Once you place the pots outdoors, water the bulbs during dry

periods and fertilize on a regular basis.

Dormant period— As summer draws to a close, plants should be prepared for a dormant period. If the bulbs are still in containers remove them from the garden. Wash pots and remove any garden debris that is on top of the soil. Move pots to a place where rainfall will not hit them. Discontinue watering. Eventually the foliage will begin to yellow and decline. Cut yellowed foliage from the bulb, making sure that the cut is not too close to the top of the bulb. At this time, or before frost, move pots to an area that does not receive direct sunlight and the temperature will not drop below freezing. Allow bulbs to “rest” for six to eight weeks.

Bulbs that have been planted directly in the soil can be removed and placed in a location with good air circulation and reduced light intensity. Once the foliage has died back, bulbs can be stored in dry peat moss for the dormant period.

Re-forcing the bulbs— After the dormant period has been completed, bulbs can be placed in a cool location, watered and forced in the same manner as previously stated.

Summer flowering bulbs like agapanthus, tuberose, ismene and callas can be left in containers and treated in a similar fashion if you want indoor bloom. It is sometimes hard to produce a quality bloom in most home situations. These bulbs generally produce the best display when containers are moved outdoors after danger of frost. Water containers when necessary and allow bulbs to bloom in their own time. When active growth begins, fertilize bulbs on a regular schedule.

Repotting— Healthy bulbs will eventually need repotting. If offsets have been produced bulbs can be divided at this time.

Hardy Bulbs

Name	Flower Color	Height	Season	Pests	Uses	Propagation
<i>Allium giganteum</i> Giant Allium	BLUE	48"	spring	few	background, border, cut	offsets
Large blooms are showy. Bulbs are relatively expensive. A rosette of foliage emerges in spring and the stem grows to a height of 4-5'. Bulbs tend to decline after two to three years and display is reduced.						
<i>Allium moly</i> Lily Leek	YELLOW	12"-14"	spring, early summer	few	border	offsets, seed
Bulbs will increase quickly. Plants produced from seed will bloom in one year.						
<i>Allium sphaerocephalum</i> Drumstick Allium	PURPLE	14"-18"	early summer	few	border, cut	offsets, seed
Flower buds are green, turning purple, producing a two-tone effect that is quite attractive. Excellent cut flowers. Tends to decline after a number of years in the garden. More effective if planted in large numbers.						
<i>Anemone blanda</i> Greek Anemone	WHITE, PINK, BLUE	4"-6"	spring	few	bedding edging	tubers, seed
Produces a carpet of bloom in early spring. Blooms will last up to three weeks if temperatures remain cool. Rhizomes are planted very shallow. Does well planted under deciduous trees where the shallow tubers will not be disturbed.						
<i>Brodiaea spp.</i> Brodoaea	BLUE, PINK	12"	late spring	few	cut, container	corms
Very good. Flowering tied to rainfall or irrigation						
<i>Camassia spp.</i> Camassia	BLUE	18-24"	late spring, early summer	few	bedding, naturalized	division
Prefers a moist, sunny or semi-shade location. If location is suitable plants will readily spread.						
<i>Chionodoxa luciliae</i> Glorry of the Snow	BLUE with WHITE EYE	6"-8"	early spring	few	border, bedding, container	offsets, seed
Can be forced. Should be planted in large numbers for an effective display.						
<i>Colchicum autumnal</i> Fall Crocus	LAVENDER	6"-8"	late summer, fall	few	border	offsets, seed
Corms produce foliage in the spring. In early summer foliage dies back and the leafless blooms appear in fall. Corms are poisonous (colchicine is extracted from them). Plants are more effective planted in groups.						
<i>Convallaria majalis</i> Lily of the Valley	WHITE	8"-10"	spring	few	border, ground cover	division after flowering
Foliage will persist throughout the summer if area is moist. In dry locations plants die back after bloom.						
<i>Crocus (species and hybrids)</i> Crocus	WHITE, YELLOW, BLUE, BICOLOR	3"-5"	early spring or fall	few	border	offsets
Large numbers of spring blooming crocus are attractive naturalized in the lawn. Some species such as <i>Crocus sativus</i> bloom in the fall. <i>C. sativus</i> is the source of saffron, but is difficult to grow in this area. (depending on the species)						
<i>Endymion hispanicus</i> Spanish Bluebells	WHITE, PINK or BLUE	12-15"	spring	few	border	offsets
Increases readily. Can be naturalized under deciduous trees. Generally blooms after narcissus. Also listed as <i>Scilla campanulata</i> or <i>S. hispanica</i> .						

(Hardy Bulbs Continued)

Name	Flower Color	Height	Season	Pests	Uses	Propagation
<i>Endymion non-scriptus</i> Bluebells Woodland plant best displayed in large numbers. Will freely hybridize with other Endymion species. Tolerates wet areas. Also listed as <i>Scilla nutans</i> or <i>Scilla non-scripta</i> .	BLUE	8-12"	spring	few	mass planting	offsets
<i>Erythronium albidum</i> White Fawn-lily Naturalized in woodland settings. Generally considered more a wildflower than a cultivated species.	WHITE	4-6"	spring	few	mass planting	offsets
<i>Erythronium dens-canis</i> Dog tooth Common names derived from shape of bulb.	VIOLET ROSE, VIOLET, WHITE	6-8"	spring	few	border	offsets
<i>Eranthis hyemalis</i> Winter Aconite Plants generally require a year or two to bloom when divided. Plants produced from seed require 3 to 4 years to produce bloom. Attractive naturalized in large numbers.	YELLOW	3"-5"	early spring	few	border	division of tubers, seed
<i>Fritillaria imperialis</i> Crown Imperial Flowers have a distinct unpleasant fragrance. Bulbs may decline in a few years.	ORANGE, YELLOW	24"-36"	spring	few	border	offsets
<i>Galanthus nivalis</i> Snowdrop Best naturalized in large numbers.	WHITE	6"-8"	early spring	few	border	offsets
<i>Hyacinthus orientalis</i> Hyacinth Generally does not increase in the garden. Bulbs often decline in a few years and will need to be replaced. Blooms are fragrant and may require staking.	WHITE, PINK, BLUE, YELLOW	10"-14"	spring	few	border, container	offsets
<i>Iris (hybrids)</i> Tall Bearded Iris Gray-green sword-like foliage is attractive in the garden after bloom has ceased. Remontant (reblooming) types are available that will produce another flush of bloom in late summer. The iris borer can be a serious problem.	VARIOUS	24"-48"	late spring	iris borer	border	division
<i>Iris kaempferi</i> Japanese Iris Divide in spring or fall. Many cultivars available. Prefers full sun or partial shade. Slightly acidic soil high in organic matter is best.	VARIOUS	24-36"	early summer	few	border, cut	division
<i>Iris reticulata</i> Netted Iris Can be naturalized in the lawn. Small blooms are showy.	BLUE	4"-6"	early spring	few	border	offsets
<i>Iris sibirica</i> Siberian Iris Should not be divided until the clump is obviously producing few blooms. Will tolerate a wet situation.	BLUE, WHITE	18"-24"	spring	few	border	division
<i>Iris 'Xiphium hybrids'</i> Dutch Iris Tends to decline after a number of years, especially if cut. The Dutch iris is a hybrid of the English and Spanish iris. Requires a moist soil for best growth.	VARIOUS	18"-24"	late spring, early summer	few	border, cut	offsets

(Hardy Bulbs Continued)

Name	Flower Color	Height	Season	Pests	Uses	Propagation
<i>Leucojum vernum</i> Snowflake Sometimes confused with <i>Galanthus</i> . Useful for rock gardens. Once established will not require much attention.	WHITE	4"-6"	early spring	few	border	offsets
<i>Lilium</i> (species and hybrids) Lily Many cultivars and species are available with a wide range of colors and flower forms. Must have a well drained location. Will grow in partial shade but is more vigorous in full sun. Plant as soon after arrival as possible, bulbs dry out quickly. Some of the most common hybrids available: <u>Asiatic hybrids</u> - Generally considered the most popular and widely available group. Generally bloom in June. Wide range of colors available. Excellent cut flowers. Depending on cultivar, blooms face out, up or are pendant. Asiatic species as well as their hybrids often produce roots along the stem just above the bulb as well as at the base of the bulb. <u>Aurelian hybrids</u> - Related to <i>L. henryi</i> . Blooms can be trumpet-shaped, bowl-shaped, pendant or sunburst. Wide range of colors. Often fragrant. Generally tall and may require staking. Bloom in June-July, depending on the cultivar. <u>Martigon hybrids</u> - Developed from <i>L. martigon</i> , Turk's-cap Lily. Blooms generally backward-curling and pendant. Generally produces a large number of buds per stem. May require staking. <u>Oriental Hybrids</u> - Produce large open flowers that may be spotted. Generally bloom mid- to late July. Foliage is alternate, not whorled like many other lilies. Can reach a height of 7' and require staking. Commercially produced cut flower. 'Casa Blanca', 'Stargazer', 'Sans Souci' are a few of the popular types. Shorter, more compact cultivars are being developed. One of the showiest types of lily for the garden.	VARIOUS	2'-6'	summer	few	border, cut	offsets
<i>Lycoris squamigera</i> Magic Lily Foliage appears in the spring and then dies back. Leafless scapes appear in late summer. Bulbs are hardy but may need a few years in the garden to reach maximum display.	PINK	24"-36"	late summer, early fall	few	border, cut	offsets
<i>Muscari armeniacum</i> Grape Hyacinth Foliage appears in the fall and persists through the winter. Flowers have a pleasant fragrance and can be cut for small bouquets.	BLUE, WHITE	4"-8"	spring	few	border, cut	offsets
<i>Narcissus</i> (species and hybrids) Narcissus, Daffodil A very hardy and highly recommended perennial bulb for this area. Foliage should be allowed to remain undisturbed until at least mid-June. Not recommended for naturalizing in the lawn. A large number of cultivars are available.	YELLOW, WHITE, PINK	3"-18"	spring	few	border, cut, container	offsets
<i>Puschkinia scilloides</i> Striped Squill Petals of each flower have a deep blue strip which aids in identification. Best used in a naturalized setting and planted in large numbers. Generally requires no further care. Division to increase vigor is only necessary infrequently.	BLUE	4-6"	early spring	few	mass	offsets
<i>Scilla siberica</i> Siberian Scilla Prefers full sun or partial shade. Tolerates a range of soil conditions. Very cold hardy.	BLUE, WHITE	4"	spring	few	border, cut	offsets, seed
<i>Tulipa</i> (species and hybrids) Tulip Best treated as an annual in this area. Bulbs are hardy, but over a period of years most tulip bulbs decline and do not produce an attractive display.	VARIOUS	8"-36"	spring	few	border, cut, container	offsets

Tender Bulbs

Name	Flower Color	Height	Season	Pests	Uses	Propagation
<i>Acidantha bicolor</i> Peacock Orchid Should be planted after danger of frost. Blooms over a period of time. Lift corms as soon as the foliage becomes discolored. Allow the foliage to ripen and die back naturally. Store dry in an area that does not fall below 60°.	WHITE/ PURPLE BLOTCH	24"-36"	summer	few	border, cut	offsets
<i>Agapanthus africanus</i> Agapanthus Can be grown in a container. For winter storage allow the container to dry out and store in an area that does not drop below 25°. While actively growing, plants should be fertilized regularly.	BLUE, WHITE	18"-24"	summer	few	border, cut, container	division
<i>Begonia x tuberhybrida</i> Tuberous Begonia Should be started indoors and then moved to the garden after danger of frost. Plant tubers in moist peat and keep shaded until a few leaves appear. Stems are fragile and plants may require staking. Lift tubers before frost and place on moist peat or soil. When foliage has died back remove and store tubers in dry peat moss. Store in an area that does not drop below 42°.	VARIOUS	12"-18"	summer	few	border, container	offsets
<i>Caladium x hortulanum</i> Caladium Can be started early indoors in moist peat moss. If grown in containers withhold water at the end of the season and store containers in a cool place. Tubers should be stored in dry peat moss.	VARIOUS LEAF COLORS	12"-14"	summer	few	border, container	division
<i>Canna x generalis</i> Canna Rhizomes should be started indoors in March. Requires full sun and adequate moisture to produce best results. Lift before frost, allow the tubers to dry and store in dry peat moss.	RED, PINK, ORANGE	24"-48"	summer	few	border	division
<i>Crocsmia x crocosmiiflora</i> Montbretia Lift before frost and allow the foliage to die back. Store corms dry.	VARIOUS	12"-18"	summer	few	border, cut	division
<i>Dahlia</i> (hybrids) Dahlia Wide range of flower forms and colors. Taller types will require staking. Requires regular fertilization during the growing season. Lift before frost and allow the foliage to die back. Store in dry peat moss.	VARIOUS	36"-72"	summer	mites, virus	border, cut	division
<i>Gladiolus x hortulanus</i> Gladiolus Prefers full sun but will tolerate partial shade. When cutting, leave at least three leaves if the corms are going to be kept. Lift corms and allow the foliage to cure. Remove the dead foliage and store corms in paper bags or trays in a well-ventilated area.	VARIOUS	18"-36"	summer	thrips	border, cut	division, offsets
<i>Hippeastrum</i> (species, hybrids) Amaryllis Bulbs can be planted in the garden but are usually forced for indoor enjoyment. See page 6 for information on forcing.	PINK, RED, WHITE	18"-24"	forced for indoor bloom	few	container, cut	offsets

Name	Flower Color	Height	Season	Pests	Uses	Propagation
<i>Hymenocallis narcissiflora</i> (Ismene calathena) Plant bulbs in the garden after danger of frost. Refer to the container section of this publication on page 6.	WHITE	18"-24"	early summer	few	border, container	offsets
<i>Ornithogalum thyrsoides</i> Chincherinchee Recommended that new bulbs be planted each year. All parts of the plant are poisonous if eaten.	WHITE	12"-24"	late summer	few	border, cut	offsets
<i>Polygonatum tuberosum</i> Tuberose Single and double forms are available. Very fragrant. Lift before frost and treat in the same manner as gladiolus.	WHITE	18"-24"	summer	few	border, cut	offsets
<i>Tigridia pavonia</i> Tiger Flower Will tolerate partial shade. Each bloom lasts only one day. Allow the foliage to die back naturally, then lift the corms. Store like gladiolus.	VARIOUS	12-18"	early summer	few	border, cut	offsets
<i>Zantedeschia aethiopica</i> Calla Lily Easy to grow in containers and store during the winter. Will tolerate a wet location. Partial shade is preferable, but will tolerate full sun.	WHITE	18-30"	summer	few	border, cut	cormels
<i>Zephyranthes grandiflora</i> Zephyr Lily Pink blooms generally appear in early summer, but may bloom sporadically over the summer. Easily grown in containers. Store like gladiolus or leave in containers.	PINK	8-12"	early summer	few	border, cut	offsets

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