

Bulbs for Florida¹

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Florida gardeners can choose from a wide variety of bulbous plants that will thrive and produce beautiful flowers year after year with proper care. Bulbous plants have thickened underground storage organs which enable them to survive unfavorable environmental conditions. These underground organs are usually the propagative units of the plants. Not all bulbous plants are true bulbs. Other specialized underground storage organs include corms, tubers, tuberous roots and rhizomes. As used here, the terms "bulb" and "bulbous plant" will refer to all underground storage organs and any plant which produces underground storage organs, respectively.

A true bulb is a compressed stem (basal plate) bearing a growing point or flower bud enclosed by thick, fleshy scales called bulb scales. Some true bulbs such as narcissus, amaryllis and tulip are protected from drying and mechanical injury by dry and membranous outer scales called a tunic.

Other true bulbs such as lilies are called non-tunicate or scaly because their outer scales are succulent and separate, giving the bulb a scaly appearance.

A corm is a solid mass of stem tissue with a terminal bud on top. In addition to the terminal bud,

axillary or lateral buds are produced at nodes on the corm. In the event that the terminal bud should be injured, these lateral buds are capable of producing shoots. The solid stem structure of the corm is protected against injury and water loss by dry leaf bases that are similar to the tunic that encloses true bulbs. Gladiolus is a typical cormous plant.

A tuber, such as a caladium, is a thickened underground stem with many buds (eyes) on its surface. Unlike some true bulbs and corms that are covered with dried leaves or scales, tubers are covered with a tough skin.

Tuberous roots such as dahlia and ranunculus are true roots and lack nodes and internodes. Buds are present only at the crown or stem end of the root.

Rhizomes are thickened horizontal stems growing along or below the surface of the ground. Underground rhizomes of canna and calla produce roots on their lower surfaces and send shoots above ground.

Selection

Florida's climate is favorable for growing many tropical and subtropical bulbous plants. The number

1. This document is Circular 552, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: June 1990. Revised: March 1994, October 2003. Please visit the EDIS website at <http://edis.ifas.ufl.edu>

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of bulbous plants is so great that the choice is not always simple. Cultural information for the most desirable bulbs for Florida is presented in Table 1. Bulbs listed are some of the best choices for home landscapes, and all have proven suitable for planting in some area of Florida. No attempt has been made to include all bulbs that can be grown in Florida.

Unfortunately, many of the common bulbs of northern states such as tulips, hyacinths, and some irises and lilies do not grow well in Florida. Very often these bulbs flower poorly or not at all, even in northern Florida. However, with special treatment many of these northern bulbs will grow and bloom the first year. Recovering bulbs for planting the following year is not recommended because the bulbs rarely flower again. Preplant handling and culture of these bulbs is presented in Table 2.

Selecting and Preparing the Planting Site

Bulbous plants can be used in landscapes as bedding plants for borders and flower beds or for cut flowers for indoor arrangements. In general, most bulbs thrive in a sunny location. However, some, such as caladiums, do best in partial shade. Heavy shade should be avoided because it will cause thin, spindly growth and poor foliage color and flowering.

Bed preparation is important for a successful bulb crop. A well-drained soil is the first thing to be considered. If the site does not drain properly, raised beds should be built and filled with soil that has good drainage properties. Adequate drainage can also be assured by installing drainage tiles, or digging ditches to carry water to lower ground.

Soil for a bulb bed should be tilled and amended by incorporating a 3- to 4-inch (7.6 to 10.2 cm) layer of organic matter such as peat, compost or well-rotted manure, and 1 to 1 1/2 pounds of 12-4-8, or an equivalent amount of other complete fertilizers per 100 square feet (10 m²) of bed. The amended soil should be leveled, moistened and treated with a soil sterilant to avoid harmful organisms and kill weed seed. Instructions are given in Table 1 and Table 2 for instances when a particular bulbous plant requires soil preparation that differs from that given above.

Planting

Once the site has been prepared, bulbs are placed over the area in neat rows or in naturalistic drifts for an informal garden effect. Space between bulbs varies with the species and the effect that the gardener wants. General spacing recommendations for many bulbous plants are presented in Table 1 and Table 2. Dig holes to the recommended depth with a trowel or small shovel (Table 1 and Table 2), place bulbs in the holes with the points facing up, firm soil around and over bulbs, and water.

General Care

If healthy plants and beautiful blooms are desired, continuing care must be given. Weeds can be controlled by spreading a 2-inch (5.1 cm) layer of mulch over the bed at planting time. Weeds that do grow through the mulch should be removed before they become firmly established in the bed.

General care includes fertilization once or twice during the growing season with a special bulb fertilizer or 1 or 1 1/2 lbs of 12-4-8 or an equivalent amount of other complete fertilizers per hundred square feet (10 m²) of bed. Bulbs such as tulips and hyacinths that are usually discarded after flowering need not be fertilized since they have enough stored food to last through the blooming period.

Water relations are a crucial phase of bulb growing, and it is important that plantings do not suffer for lack of water during times of growth and flowering. Except when bulbs are being dried off at the end of a growing period, keep the soil moderately moist at all times. Frequency of watering will depend greatly on soil type, time of year and weather conditions.

A good cultural practice is to remove dead blooms before seeds are produced. Flowering in the following season will be reduced considerably if seeds are allowed to set. Removing dead blooms also helps to maintain the aesthetic value of the planting and may prevent disease problems.

Many bulbous plants grow best if left in the ground year after year while others may become crowded and bloom poorly. Digging and replanting

usually encourages more uniform flowering and larger flowers. It may be desirable to dig certain bulbs annually so that they can be replaced with other plants in the bed. Tropical bulbous plants, such as caladiums growing in north Florida, should be dug and stored to prevent injury by cold winter temperatures.

After digging, bulbs should not be exposed to the sun, but should be left in a dry, well-ventilated place for a few days. The roots, dead leaves, and soil are then removed and the clean bulbs are placed in single layers in trays and stored. To reduce the chance of insect and disease damage, a combination of fungicide and insecticide dust may be applied.

Special techniques in planting and general care peculiar to certain bulbous plants will be mentioned in the cultural notes section of Table 1 and Table 2 .

Propagation

Enlarged storage organs of bulbous plants are often used in vegetative propagation. True bulbs (amaryllis, hyacinth, narcissus) develop miniature bulbs, known as bulblets, which, when grown to full size, are known as offsets. Offsets can be separated from the mother bulb and replanted into beds. The number of growing seasons required for the offsets to reach flowering size will depend on the kind of bulb and size of the offset. Some bulbs such as amaryllis, blood lily, hurricane lily and spider lily can be cut into several vertical sections and each section planted upright in a mixture of equal volumes of sand and peat. Bulblets will develop from the basal plate between the bulb scales. These can then be transplanted into beds to continue development. Lily bulbs can be increased by removing individual scales and planting them about 1 to 2 inches deep in moist peat and sand. Within 3 to 6 weeks, 3 to 5 bulblets will usually develop from each scale.

Corms, such as gladiolus and watsonia, produce new corms on top of the old corms, which wither. Miniature corms called cormels are produced between the old and new corms. These can be separated from the mother corms and stored along with the new corms over winter for planting in the spring. New corms usually produce flowers the first

season, but cormels require 2 or 3 years of growth to reach flowering size.

Tubers (caladium, gloriosa), tuberous roots (dahlia, ranunculus) and rhizomes (canna, day lily) are propagated by cutting them into sections, each containing at least one bud. Special care should be taken when dividing dahlia tuberous roots to ensure that each tuberous root has a piece of crown bearing a healthy bud. Tuberous roots that are broken off without a bud are worthless.

Many bulbous plants produce seed that will germinate and grow into flowering plants. This method of propagation is not very popular because many varieties today are hybrids, so flower color and type may be highly variable and results can't be predicted.

Diseases and Pests

Bulbous plants are susceptible to damage by many diseases and pests. The most difficult diseases to control are insect-transmitted viruses. Symptoms of virus infection are stunted growth, mottled or striped leaves, and malformed foliage and flowers. The only treatment for virus is to destroy infected plants and to control insect vectors.

When the soil remains extremely wet because of poor drainage, soilborne bacteria and fungi may cause some bulbs to rot. Once the pathogen has invaded the root zone, little can be done to control the disease. Improved soil drainage and removal of infected plants will help to control this problem. Spraying with a bactericide or fungicide may be helpful if the damage is not too severe.

Chlorosis or yellowing of bulb foliage is a common symptom caused by lack of nitrogen, iron, zinc, magnesium or manganese. This may be caused by an actual deficiency of these elements in the soil, or roots may be unable to absorb these nutrients due to poor aeration, disease, or nematodes. The availability of iron and manganese is also limited in high pH soils. All of these factors may interact, making it difficult to determine a specific cause for chlorotic foliage. Publications on adjusting soil pH and correcting nutritional disorders can be obtained from your local county extension office.

Insects directly damage bulb plants and allow disease organisms into plant tissue. Chewing insects such as caterpillars and grasshoppers should be carefully monitored and controlled by hand picking. Pesticides should only be used when the infestation can't be controlled manually.

Aphids are soft-bodied, sucking insects varying in size from 1/25 to 1/8 inch (1 to 3 mm) in length. Aphids suck plant fluids and cause new growth to curl and become distorted. The most serious result of aphid infestation, however, may be the spread of virus diseases. Complete control is essential for bulbous plants such as tulip, calla lily, dahlia, gladiolus, hyacinth and iris, which are adversely affected by virus diseases.

Thrips are tiny insects (1/25 to 1/12 inch [1 to 2 mm] in length) that feed by rasping soft plant tissue and sucking plant fluids. They commonly invade flowers during the warm, dry season of springtime causing brown spots on petals and preventing buds from opening. Complete control is difficult as reinfestation from neighboring plants is the general rule.

Spider mites are tiny animals (1/50 inch [0.5 mm] long) that cause injury similar to that of sucking insects as they feed on the leaves of bulbous plants during warm, dry periods. Bulb mites attack rotting bulbs and tunnel into healthy bulbs, transmitting organisms that produce bulb rot. Bulb mites are particularly damaging to bulbs of amaryllis, gladiolus, hyacinth, lilies, daffodil and tulip.

Mealybugs are soft-bodied insects covered with a white, waxy material. When mature, they vary from 1/50 to 1/3 inch (0.5 to 8.5 mm) in length. They damage plant foliage by sucking plant fluids and may invade stored bulbs. Some control can be obtained by frequent syringing with a hose.

Many bulbous plants are damaged by microscopic, transparent, wormlike animals called nematodes. Best known to gardeners are the root-knot nematodes that make galls on roots. Nematodes feed on the roots and may cause disintegration of the basal plate of some bulbs when present in sufficient numbers. When an infestation

builds up in the soil, replant bulbs in another area or treat the area with a soil sterilant.

When pest infestations are severe or where large numbers of plants are involved, chemical control may be needed. For recommendations on selection and application of insecticides, miticides and soil sterilants, contact the agricultural extension agent in your county.

Animals such as moles, pocket gophers, rabbits and squirrels can damage bulbs and bulb-like structures. Trapping is probably the most effective control for these pests. Repellents may keep rabbits away when used as directed.

Bulbs in South Florida

The informality of most south Florida gardens means that bulbs are normally used in small groups among shrubs or herbaceous ground covers rather than in beds by themselves. This makes it difficult to treat the soil against nematodes and means that the most popular and successful bulbs are those that thrive under the same cultural treatment as the rest of the plants in the bed.

Most of the bulbs familiar to northern gardeners are not satisfactory in south Florida. Even when bulbs are brought in from cool regions and given the necessary cold treatment to induce blooming, the flowers will be very short-lived and often smaller and less brightly colored than usual.

In Table 1 and Table 2, the column headed **Zone** has two entries for south Florida to distinguish between those bulbous plants that are well adapted and those that need special care. The entry **S** means that the plants can usually be used in mixed beds with good success. Those marked (**S**) are not robust enough to do well in ordinary garden situations. Those without either of these symbols cannot be recommended. Further information is given in the cultural notes column where applicable. The planting season in south Florida is usually longer than that stated. The plants can be moved any time except when they are in bloom.

Table 1. Bulbs for Florida

Key for "Zone" column: Zone = section of state which adapted; NCS = Entire state; N = North Florida, Pensacola to Jacksonville and south to Ocala; C = Central Florida, Leesburg south to Punta Gorda and Ft. Pierce; S = South Florida, Stuart to Fort Myers and south to Homestead; (S) = Denotes plants that will not do well in typical south Florida gardens

Table 2. Bulbs for the Avid Gardener

Key for "Zone" column: Zone = section of state which adapted; NCS = Entire state; N = North Florida, Pensacola to Jacksonville and south to Ocala; C = Central Florida, Leesburg south to Punta Gorda and Ft. Pierce; S = South Florida, Stuart to Fort Myers and south to Homestead; (S) = Denotes plants that will not do well in typical south Florida gardens

Table 1. Bulbs for Florida

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
African Lily <i>Agapanthus africanus</i>	Rhizome	NCS	Oct-Feb	tip just below soil surface	12 inches	summer & early autumn	full sun to partial shade	blue and white	division of rhizomes
Cultural Notes: Will need winter protection in north FL. Soil should be amended with organic matter at planting. Can be grown as a potted plant or in garden but blooms more freely when crowded. Requires plenty of moisture during growing season. Clumps may be divided every 2 to 3 years. Usually short-lived in extreme south FL.									
Amaryllis <i>Hippeastrum</i> spp.	Bulb	NCS	Sept-Jan	tip at soil	10-12 inches	spring	partial shade	white to deep red	offsets, cottage of bulbs
Cultural Notes: Plants may be left in the ground for a number of years or dug and reset in Sept. Soil should be amended with organic matter. Amaryllis can be grown as potted plants. Pot so half of bulb is out of soil.									
Amazon Lily <i>Eucharis grandiflora</i>	Bulb	CS	Feb-May	tip on surface of soil	3-4 bulbs per 8-inch pot	winter	partial shade	white	offsets
Cultural Notes: May be grown in ground, but in FL they do best if grown in pots. Will bloom more freely when roots are confined. Should be kept very moist during active growth. To force blooming, alternate drying and light sprinkling for a month, then water heavily and apply a high-analysis liquid fertilizer.									
Aztec Lily <i>Sprekella formosissima</i>	Bulb	NCS	Any time of year	3-4 inches	8 inches	spring & summer	full sun	blood red	offsets, seeds
Cultural Notes: If allowed to become crowded and to dry out occasionally, plants will bloom several times during summer. May be grown as potted plant.									
Blood Lily <i>Haemanthus multiflorus</i>	Bulb	NCS	spring	tip just above soil surface	grown in 6-8-inch pots	summer	partial shade	red	offsets
Cultural Notes: in fall and winter keep the soil fairly dry and do not fertilize.									
Butterfly Lily <i>Hedychium</i> spp.	Rhizome	NCS	summer	just below the surface	1 - 2 feet	spring	full sun to partial shade	white, yellow, red	division of rhizomes

Table 1. Bulbs for Florida

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Cultural Notes: These plants thrive in boggy soils. They should be kept moist and soil should be enriched with organic matter before planting. Unnecessary to dig rhizomes except for propagation.									
Caladium <i>Caladium X hortulanum</i>	Tuber	NCS	Feb-May	2 inches	12-18 inches	summer to autumn	full sun to partial shade	flowers are insignificant; grown for its colored foliage	division of tubers leaving at least one bud per section
Cultural Notes: Fertilize every 2-3 weeks during active growth. In south FL tubers can be left in ground until crowded. In north FL dig up each winter and store clean, dried tubers in a dry, well-ventilated area at a minimum of 70°F (21°C).									
Calla <i>Zantedeschia</i> spp.	Rhizome	NC(S)	Sept-Jan	3-4 inches	1-2 feet	spring	full sun to partial shade	white, pink and yellow	division of rhizomes
Cultural Notes: Can remain in ground or be dug up and stored until planting. Red spiders and thrips are a problem. Soil should be kept moist. Not satisfactory in extreme south FL.									
Canna <i>Canna X generalis</i>	Rhizome	NCS	Feb-Apr	2 inches	12-14 inches	May to first frost	full sun to partial shade	red, yellow, orange, and all hues except blue	division of rhizomes
Cultural Notes: Canna thrive under high summer temperatures. Frost kills foliage to the ground but it will come up again from rootstock. Soil should be moist and enriched with organic matter. Fertilize heavily. Dig and thin out rhizomes to rejuvenate plants and assure the production of many blooms. Leaf rollers (insect larva) and canna rust are serious problems.									
Crinum <i>Crinum</i> spp.	Bulb	NCS	any time of year but winter best	neck of bulb above ground	12-18 inches; large species, 3 feet	spring & summer	full sun to partial shade	white to deep rose	offsets
Cultural Notes: Mulch is recommended over cultivation. Soil should be well-drained although established plants can tolerate flooding. Can be grown as a potted plant. Plant so that half the bulb is above soil surface. Salt tolerant.									

Table 1. Bulbs for Florida

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Dahlia <i>Dahlia</i> hybrids	Tuberous root	NCS	Feb-March; Dec-Jan in south FL	6 inches	15-30 inches	early summer	full sun	many colors	separation of tuberous roots (each must have a piece of stem with a bud), seeds and stem cuttings
Cultural Notes: Will do better in north FL. Dahlias do not tolerate high summer temperatures. Soil should be sterilized at bed preparation. Soil should be enriched with organic matter. Plants should be staked and roots dug and stored during winter.									
Day lily <i>Hemerocallis</i> spp.	Rhizome	NCS	Nov-Jan	4 inches	12-18 inches	spring & summer	full sun to partial shade	many colors	division of rhizomes
Cultural Notes: Soil should be amended with organic matter at planting, rhizomes can be left in soil for 5-10 years. Varieties number in the thousands, but the choices for south FL are much more limited.									
Elephant Ears <i>Alocasia</i> , <i>Colocasia</i> , <i>Xanthosoma</i> spp.	Rhizome and tuber	NCS	Sept-Dec	4 inches	2-4 feet	spring	full sun to light shade	flowers insignificant; grown for its large leaves	division of rhizomes or tubers
Cultural Notes: May be killed to the ground by frost in north FL. Moist soil is essential.									
Gladiolus <i>Gladiolus</i> spp.	Corm	NCS	any months of year in frost-free areas	3 inches	4-6 inches	3 months after planting	full sun	many colors	cormels
Cultural Notes: Frost will kill plants in N. FL. Soil should be amended with organic matter at planting time. Corms should be dug when foliage begins to yellow. Dry in ventilated place for a week and then clean the corms of tops, exhausted mother corms, cormels, roots and soil. Store corms at 40° to 50°F. Not satisfactory in summer in south FL.									
Gloriosa Lily <i>Gloriosa</i> spp.	Tuber	NCS	Jan-Apr	4 inches	1 foot	March through summer	full sun to partial shade	crimson and yellow orange	division of tubers, seeds

Table 1. Bulbs for Florida

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Cultural Notes: Water plants at planting then again when growth shows above ground. Tubers may be dug up or left in ground. Plants should be trellised. Two most popular species of gloriosa are <i>G. rothschildiana</i> and <i>G. Superba</i> .									
Hurricane Lily <i>Lycoris</i> spp.	Bulb	NC	Nov-Jan	3-4 inches	6-8 inches	early fall	full sun to light shade	yellow, red, pink	bulb cuttage and offsets
Cultural Notes: Water at planting then again when growth shows. Should be dug when crowded. <i>Lycoris radiata</i> (red flowers) and <i>L. aurea</i> (yellow flowers) are the two most widely grown in FL.									
Iris <i>Iris</i> spp.	Rhizome	NC	late summer or fall	1 inch	8 inches	spring	semi-shade	many colors	cutting of rhizomes
Cultural Notes: Seven species of native iris and the native Louisiana iris and their hybrids perform well in FL. German and Japanese iris usually do not grow well in FL.									
Kaffir Lily (Clivia) <i>Clivia minata</i>	Bulb	NCS	any time of year	just below the surface of soil	18-24 inches	spring	partial shade	orange to scarlet	offsets, bulb cuttage
Cultural Notes: Will bloom more freely if roots are confined. Will bloom during the winter as a pot plant. Will not endure soggy soil.									
Lily <i>Lilium</i> spp.	Bulb	NC(S)	fall or early spring	4-6 inches	9-10 inches	spring & summer	full sun to partial shade	white, yellow, orange, red	offsets, scales, division of double and triple-nosed bulbs
Cultural Notes: Lilies commonly grown in FL are: Easter lily (<i>Lilium longiflorum</i>), Formosan lily (<i>L. formosanum</i>), Madonna lily (<i>L. candidum</i>), regal lily (<i>L. regale</i>), speciosum lily (<i>L. speciosum</i>) and gold-banded lily (<i>L. auratum</i>). FL has one native species, Catesby or pine lily (<i>Lilium catesbaei</i>), which is commonly seen in moist flatwoods in Aug. and Sept.									
Marcia (Walking Iris) <i>Neomarica gracilis</i>	Rhizome	NCS	any time of year	just below surface of soil	12 inches	spring & summer	partial shade	white with yellow and blue	small plantlets which arise near end of flower stem, division of rhizomes
Cultural Notes: Should be protected from cold in north FL. For best results, use as a potted plant. Soil should be well drained.									

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Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Moraea (African Lily) <i>Morea</i> spp.	Rhizome	NCS	any time of year	2 inches	6 inches	spring & summer	full sun	white with blue markings	division of rhizomes, separation of clumps
Cultural Notes: Require relatively little care. Each flower lasts only 2 days.									
Narcissus (Polyanthus Narcissus) <i>Narcissus tazetta</i>	Bulb	NC	Sept-Dec	4 inches	8 inches	spring	full sun to partial shade	white, cream, yellow, orange	offsets
Cultural Notes: The polyanthus narcissi-paper white, Chinese sacred lily, Pearl White lily, and Grand soleil d'or do well, but little success can be expected with the true daffodil.									
Shell Lily (Shell Ginger) <i>Alpinia zerumbet</i>	Rhizome	CS	spring or fall	just below surface of soil	1-2 feet	summer	full sun to partial shade	white with yellow, brown and red	division of rhizomes
Cultural Notes: Should be grown in soil enriched with organic matter at planting time.									
Snowflake <i>Leucojum</i> spp.	Bulb	NC	Sept-Nov	4 inches	4-6 inches	Feb-March	full sun	white with colored tip	offsets
Cultural Notes: Can be left in the ground for about 10 years then dug. Soil should be enriched with organic matter at planting.									
Society Garlic <i>Tulbaghia violacea</i>	Bulb	CS	any time of year	2 inches	6-8 inches	spring, summer and fall	full sun	purple	offsets
Cultural Notes: Has a garlic odor that may be objectionable.									
Spider Lily <i>Hymenocallis</i> spp.	Bulb	NCS	any time of year	3-5 inches	12-15 inches	spring & summer	full sun	white, yellow	offsets

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Cultural Notes: Can be dug up and divided every 4-5 years. Soil should be enriched with organic matter. May be grown as potted plants.									
Tritonia <i>Tritonia crocata</i>	Corm	NCS	winter or early spring	2-3 inches	3 inches	spring & summer	full sun	variety of colors	cormels
Cultural Notes: Named varieties of tritonia with large blossoms can be grown for one season. The variety <i>miniata</i> grows from year to year in FL; clumps can grow several years without digging.									
Tuberose <i>Pollanthes tuberosa</i>	Rhizome	NC	Jan-March	2 inches	12 inches	summer & fall	full sun	white	division of rhizomes
Cultural Notes: Soil should be kept moist during growing season. After foliage dies in summer the rhizomes can be dug. In well drained soils, clumps may be left undisturbed for a year. Very susceptible to damage by nematodes.									
Watsonia <i>Watsonia</i> spp.	Corm	NCS	Sept-May	4 inches	8 inches	3 months from planting	full sun to partial shade	variety of colors	cormels
Cultural Notes: May be planted further apart than 8" and left in the ground until they become crowded.									
Zephyr Lily <i>Zephyranthes</i> spp.	Bulb	NCS	Sept-March	1-2 inches	3 inches	spring to fall	full sun to partial shade	white, yellow, pink and red	bulblets, seeds
Cultural Notes: Soil should be enriched with organic matter before planting. Do not need to be dug up and stored. Can be grown as potted plants.									

Table 2. Bulbs for the Avid Gardener

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Achimenes <i>Achimenes</i> spp.	rhizome	NC(S)	late winter or spring	1/2-1 inch	1-2 inches	summer	light shade	many colors	division of rhizomes, seeds
Cultural Notes: Usually grown in containers as a house plant. Fertilize once a month during growing season. After flowering, foliage declines and gradually dies. For the next 2-3 months, water monthly to prevent rhizomes from dehydrating. Gradually increase watering at the first sign of growth.									
Allium <i>Allium</i> spp.	Bulb	NC	spring	2-3 times diameter of bulb	6-18 inches	spring, summer and fall (depending on species)	full sun	many colors	offsets, seeds
Cultural Notes: Because they are members of the onion family all have characteristic odor. Should be fertilized after new growth starts. Should be dug only when crowded.									
Alstroemeria <i>Alstroemeria</i> spp.	tuberous root	NCS	spring	6 to 9 inches	1 foot	summer	full sun to partial shade	many colors	division of tuberous roots, seeds
Cultural Notes: Require excellent drainage and enriched soil with organic matter. Stems should be supported. Can be grown as potted plants. Only the strongest cultivars survive in south FL.									
Anemone <i>Anemone</i> spp.	tuber	NC	Oct-Dec	3/4-1inch	6-8 inches	spring	full sun to partial shade	many colors	division of tubers
Cultural Notes: The best soil is well drained with a pH of 6.5 to 7.0.									
Begonia <i>Begonia</i> spp.	tuber	NC(S)	spring	1-2 inches	12-15 inches	summer	partial shade	many colors	division of tubers
Cultural Notes: Fertilize every 2-3 weeks from time foliage appears until it withers away. Soil should be sterilized at planting and tubers dug up in winter and stored at 40° to 50°F. Only satisfactory in cool periods in south FL.									
Buttercup (<i>Ranunculus</i>) <i>Ranunculus</i> spp.	tuberous root	NC	Nov-Dec	1/2-inch	8-10 inches	Feb	full sun	many colors	division of tubers

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Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Cultural Notes: Plant tubers with claw side down. Dig tubers after foliage withers and store over winter at 50° to 55°F.									
Cyclamen <i>Cyclamen</i> spp.	tuber	NC	midsummer and fall depending on species	just below surface of soil	6-8 inches	winter & spring	light shade	many colors	tubers, seeds
Cultural Notes: Grown primarily as a pot plant in FL. They do best in bright, indirect sunlight at night temperatures of 40° to 55°F and day temperatures of 65° or lower.									
Dutch Iris <i>Iris</i> hybrids	bulb	NC	Nov-Feb	4 inches	3 inches	March-May	full sun	many colors	offsets, however, they do not reproduce well in FL
Cultural Notes: Pot culture is successful. There is little use in trying to carry bulbs over from year to year.									
Freesia <i>Freesia</i> spp.	corm	NC	Nov-Dec	2 inches	3 - 6 corms per 6-inch pot	Jan-Feb	semi-shade	many colors	cormels, seeds
Cultural Notes: Freesias do best as potted plants in FL. Corms should be dug up and stored when foliage turns yellow.									
Gloxinia <i>Sinningia speciosa</i>	tuberous root	NCS	Dec-March	at surface of soil	one tuberous root per pot	April-July	partial shade	many colors	leaf cuttings, division of tuberous roots, seeds
Cultural Notes: Only grown as house plant. Leaves will wither but reappear after 2 to 3 months. Water and fertilize from time leaves appear until they wither, then withhold fertilizer and water.									
Grape hyacinth <i>Muscari</i> spp.	bulb	NC	late summer or early fall	3 inches	3 inches	spring	full sun to light shade	sky blue, white, mauve, yellow	offsets
Cultural Notes: Usually grown as house plants. Water at planting, then again when foliage appears. Keep soil moist during growing season.									

Table 2. Bulbs for the Avid Gardener

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Hyacinth <i>Hyacinthus</i> spp.	bulb	N	Oct-Dec	3 inches	5-6 inches	Feb-April	full sun	white, yellow, red, purple, blue	offsets, cuttage, however, they do not reproduce in FL
Cultural Notes: Flowers poorly in FL. Bulbs require chilling about 60 days at 40°F and 120 days at 50°F. Bulbs chilled in a refrigerator with ripening fruits may fail to bloom. The gas (ethylene) produced by ripening fruit can cause flower buds to abort. Plant bulbs immediately upon removal from cold storage. Discard bulbs after blooming and plant new ones each year.									
Ixia (African Corn Lily) <i>Ixia</i> spp.	corm	NCS	late Nov-Feb	3 inches	3-6 inches	spring & summer	partial shade	many colors	cormels, seeds
Cultural Notes: Corms only last 1 or 2 seasons. Soil should be kept dry during the summer. Should be dug and reset in fall. Apply fertilizer when new growth appears.									
Lachenalia (leopard lily) <i>Lachenalia</i> spp.	bulb	NC	late summer or early fall	1-2 inches	3-5 inches, 6 bulbs per 5-inch pot	winter or earlyspring	full sun	many colors	offsets
Cultural Notes: Usually grown as house plants. Water at planting, then again when foliage appears. Keep soil moist during growing season.									
Pineapple Lily <i>Eucomis</i> spp.	bulb	NCS	fall	5-6 inches	1 foot	mid-summer	full sun	white, yellow with purple markings	offsets
Cultural Notes: Can be grown in containers. Apply fertilizer when new growth starts.									
Scarborough Lily <i>Valloia speciosa</i>	bulb	NC(S)	early summer	tip just beneath surface of soil	15-18 inches	late summer & fall	light shade	red, pink or white	offsets
Cultural Notes: Survive winter only in south FL. Can be grown as potted plants.									

Table 2. Bulbs for the Avid Gardener

Name	Type	Zone	Planting Time	Depth	Space Between Plants	Blooming Season	Shade Level	Flower Color	Propagation
Star-of-Bethlehem <i>Ornithogalum</i> spp.	bulb	NCS	fall	2-6 inches depending on size	6-8 inches	spring	full sun or light shade	white, yellow	offsets
Cultural Notes: Will grow in almost any soil; spreads very fast.									
Sternbergia <i>Sternbergia</i> spp.	bulb	NC	midsummer	3 inches	5 inches	fall	full sun	yellow	offsets
Cultural Notes: Bulbs can be left undisturbed for years.									
Tiger flower <i>Tigridia pavonia</i>	bulb	NC	spring	4 inches	4-8 inches	summer	full sun to partial shade	many colors	offsets, seeds
Cultural Notes: Each bloom lasts 1 day. Should be fertilized every 2-3 weeks. Dig and reset every 3-4 years.									
Tulip <i>Tulipa</i> spp.	bulb	N	Dec-Jan	5 inches	8 inches	spring	full sun to partial shade	variety of colors	bulbets, however, they do not reproduce well in FL
Cultural Notes: Flowers poorly in FL. Bulbs require chilling for about 60 days at 40°F and 120 days at 50°F. Bulbs chilled in a refrigerator with ripening fruit may fail to bloom. The gas (ethylene) produced by ripening fruit can cause the flower buds to abort. Plant bulbs immediately upon removal from cold storage. Discard bulbs after blooming and plant new ones each year.									
Voodoo Lily <i>Amorphophallus</i> spp.	corm	NCS	Dec-March	4 inches	6 inches -3 feet for large types	spring often before leaves	sun or partial shade	reddish purple	cormels
Cultural Notes: Flowers may have bad odor. Leaves large and spectacular. Some species hardy as far north as Washington D.C. Responds favorably to frequent fertilization.									