

## The Fig<sup>1</sup>

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### History of Fig Cultivation

The fig (*Ficus carica* L; family Moraceae) originated in the Old World Tropics -- Asia Minor and the Mediterranean region. In the Mediterranean, the fig has been cultivated since as early as 5,000 BC.

The fig tree was first introduced to the Americas in 1575 by Spanish explorers in Florida. On the West Coast, in the area that eventually became the State of California, Spanish Franciscan missionaries introduced the cultivar, Mission, to the area that, in 1769, became the mission San Diego. Additional fig cultivars were also imported to the California area from Mediterranean countries, including Turkey.

Because some of the imported figs required pollination by the fig wasp (*Blastophaga psenes*), the absence of this wasp lead to an initial failure of fig cultivation on the West Coast. This impediment to cultivation was remedied by the importation of the fig wasp.

However, the fruit of these fig cultivars had open "eyes" or ostioles (opening at the fruit apex) and were often attacked by insects and diseases. Scientists -- including Ira J. Condit, William B. Storey and others working on genetic improvement of figs --

released new cultivars with closed eyes, cultivars that did not require pollination. Additionally, many fig cultivars were imported from the Old World within the last 50 years. Currently, however, no fig-breeding programs remain in the United States, and among at least 60-100 named cultivars of figs, relatively few are commonly grown in the southeastern United States.

### Adaptation

The fig is adapted to dry, Mediterranean-type climates, such as California. The humid growing season in Florida is associated with enhanced insect and disease pressure, and rain can cause fruit to split. Fig cultivars do not require more than 100 hours of temperature of 45°F or less during the dormant season to promote normal vegetative and reproductive bud development. As a result, figs receive sufficient winter chilling in all areas of Florida except south. Fully dormant trees are hardy to about 15 -20°F. Exposure of trees to low temperature preconditions can increase cold hardiness.

Fig trees that are not cold conditioned often sustain cold injury in Florida and in other parts of the southeastern United States. Fig trees grown in this

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1. This document is HS27, one of a series of the Horticultural Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date, March 1994. Revised November 2009. Visit the EDIS Web site at <http://edis.ifas.ufl.edu>.
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region are frozen to the ground in some years and, consequently, will often have a bush-like growth habit after sprouting back from the roots.

## Description of Tree

### Growth Habit

The fig is a deciduous tree that can reach 50 feet in height. However, in the southeastern United States, this tree is seldom taller than 25 feet due to periodic cold injury to the trunk and limbs. Most fig trees in the southeastern United States are multiple-branched shrubs. Fig wood is weak and decays rapidly. Small branches tend to be more pithy than woody. When branches are cut or damaged, they produce copious quantities of a milky latex that can be a skin irritant. This latex contains a protein-degrading enzyme called ficin, which is similar to papain. Fig trees produce roots that can be very deep in well drained soils. The lateral spread of roots can be substantial.

### Leaf Morphology

Fig leaves are large (up to 1 foot long), thick, colored a bright dark green, single and alternate. These leaves are deeply lobed with usually three to five sinuses. Leaves contain trichomes (pubescence), which is particularly rough on the adaxial (upper) leaf surface. Leaf pubescence can also be an irritant to the skin.

### Flower Morphology

Flowers are minute, unisexual, bearing either stamens or pistils, depending upon the type of fig. Flowers are borne in leaf axils. Common figs are all female and do not require pollination (discussed below).

## Fruit

### Fruit Morphology

The fruit of a fig is unique and is derived from a hollow peduncle that becomes fleshy and forms a structure called a synconium. The unfertilized ovaries provide the resin-like flavor associated with fruit of fig. Fruit can contain a closed or an open ostiole or eye located at the fruit apex.

## Fruit Types

There are four types of figs -- Caprifigs, Smyrna, San Pedro and common types, which are recommended for Florida. Caprifigs produce staminate (male) flowers and are useful only as a source of pollen. Smyrna bears only pistillate (female) flowers and requires a caprifig for pollination. San Pedro has pistillate flowers and bears two crops, one on leafless wood requiring no pollination and the other borne on new wood that requires pollination. Fig cultivars recommended for Florida belong to the common types of fig and are parthenocarpic; fruit develop without pollination. Smyrna and San Pedro types will not bear fruit in Florida because of the absence of Caprifigs and a wasp pollinizer (*Blastophaga psenes*). Because the common types of fig do not require a wasp pollinizer, the best cultivars have a closed ostiole to minimize rotting by preventing the occurrence of insects or rain water inside the fruit.

## Culture and Management

### Location

Figs perform best in locations with full sun all day. Fig trees often shade out competing vegetation below the tree canopy. These trees should not be confined to a small landscape. The trunk and major limbs, if not shaded, can experience sun scald, which can be minimized by applying white latex paint. The root system of fig trees can extend well beyond the tree canopy.

### Planting

In Florida, bare-rooted fig plants can be planted during the dormant season, from December to late February. Container-grown plants can be planted any time of the year provided they receive irrigation.

### Irrigation

Irrigation is required for fig trees during the establishment year. During that period, a fig tree should receive 10 gallons per application at least three times a week. Irrigation after the establishment year is optional except during a prolonged drought. For mature fig trees, irrigation of 20-50 gallons per tree can be applied if a drought persists more than a few

weeks. Drought-stressed trees are more susceptible to nematodes and will not fruit well.

### Pruning

Fig trees do not require pruning to be productive. Sometimes fig trees are pruned to a central leader or to a modified central leader, but such pruning is usually futile since these trees are often frozen back and regrow in bush form. Freeze-damaged wood should be eliminated after regrowth commences. The fruit is borne on terminals of wood from the previous year. Thus, the amount of pruning should be minimal.

If the tree is pruned, the pruning should occur after fruit ripening (early in the summer) to allow for flower-bud initiation for the next year. For late-maturing cultivars, pruning may result in a significant reduction in yield the next year. Heavy winter pruning can eliminate the entire crop the following year.

### Fertilization

Little information is available concerning fertility requirements of fig trees. However, the general consensus is that fig trees typically require light fertilization. Excess fertilization can promote excessive vegetative growth and low yield. If the total amount of vegetative growth is less than one foot in length, then it is appropriate to apply fertilizer. For young trees, 1/2 pound of 10-10-10 with micronutrients can be applied three to five times during the growing season, starting in late winter (February to March) and ending by 1 August. For large trees, apply 2-4 pounds of 10-10-10 with micronutrients three to five times during the growing season (February to August).

### Cold Injury

Fig trees often sustain cold injury in the southeastern United States. Brown Turkey and Celeste are common cultivars that are reported to be more cold hardy than many other fig cultivars. Cultural practices that promote a growth flush in late summer (the application of fertilizer and irrigation) should be discouraged since this tender tissue will be frozen and killed by temperatures just below freezing.

Fig trees in Florida often are not cold-conditioned in the fall prior to the onset of winter cold. If properly cold-conditioned, however, fully dormant trees can withstand temperatures from 15-20°F without severe damage. Dormant buds are more susceptible than wood to sub freezing temperatures. As mentioned earlier, most fig trees in the southeastern United States assume a bush-like, rather than a tree-like growth habit due to cold injury of the trunk and major scaffold limbs.

### Propagation

Fig trees are usually propagated by using dormant cuttings. Select dormant wood about 8-12 inches long and less than 1 inch in diameter. The basal end of the cutting should be 2-year-old wood.

Place cuttings in moist, but not wet Perlite or in another moist, porous medium. At least half the length of the cutting should be below the soil level. The basal ends of cutting should callus in two to three weeks at a temperature of 50-60°F. Rooting efficiency can be enhanced by making basal cuts directly below the nodes and by the use of a rooting hormone. Leafy shoots require frequent irrigation or the use of a mist bed until roots are fully functional. (For more info on the construction of a mist bed, readers are referred to *Installation of Mist Propagation Equipment*, <http://edis.ifas.ufl.edu/EP032>.) Fig trees are rarely propagated by chip or patch budding or by whip, side, inlay or cleft grafting. Rooted cuttings can be transferred to the field after sufficient roots have formed. Newly set trees should receive irrigation every day or every two days.

### Pests

Fig trees are a moderately sustainable crop, but suffer from a number of animal and disease pests. Fig tree roots are a favorite food of birds, gophers, rabbits and squirrels, which also feed on the fruit. Root knot nematodes can also be a limitation for fig trees planted in sandy soils, but are not usually a problem in fertile or loamy soils. Organic amendments or mulches reduce nematode damage. A number of insects and diseases can attack fig fruit if the cultivar is one with an open eye.

The most common disease of fig in the southeastern United States is the fig rust (*Cerotelium fici*). Fig rust turn leaves brown, can cause defoliation and premature ripening of the fruit and decreases cold tolerance. This disease can be controlled by a 5-5-50 Bordeaux spray (copper sulfate, lime and water) applied every two to three weeks.

Other fig diseases include *Botrytis cinerea* (fungus), Cercospora leaf spot fungus (*Cercospora fici*), which causes branch terminals to turn black and die. Thread blight (*Pellicularia koleroga*) results in necrosis of stems and matted foliage. *Botryosphaeria dothidea* (fungus) causes necrosis of leaves and stems. *Rhizopus stolonifer* (smut) causes fruit drop of cultivars with an open eye. *Fusarium* spp. and *Aspergillus niger* are fungus that attack ripe fruit.

Although many diseases attack figs, most figs are grown in homeowner settings and do not receive pesticide sprays. The most common insect pests are mealy bug, three-lined fig borer and ants. The application of insecticide is seldom warranted. Please contact your County Extension Agent for spray recommendations.

## Fig Cultivars

### Cultivar Selection

Characteristics that should be considered in the selection of fig cultivars include the following:

1. Cold hardiness;
2. The ability to set fruit without pollination (parthenocarpy);
3. Fruit having a closed eye or ostiole;
4. A long peduncle that allows the fruit to droop and shed moisture; and
5. A green skin on fruit to minimize bird herbivory.

Ten cultivars of figs (Alma, Black Spanish, Brown Turkey, Conadria, Celeste, Jelly, Osborne Prolific, Pasquale, Tena and Ventura) have been evaluated in a replicated trial at the University of Florida's North Florida Research and Education Center in Monticello, Fla. Other cultivars of figs not

tested by the University of Florida include the following: Champagne, Green Ischia, Hunt, Kadota, LSU Gold, LSU Purple, Magnolia, O Rourke and Tiger.

### Characteristics of Fig Cultivars

A summary of the characteristics of the fig cultivars follows below. Alternate names of cultivars appear in parentheses:

**Alma:** This cultivar is reported to produce high yields. Alma is moderately cold tolerant and produces a medium-sized fruit with brown skin and a light tan pulp. The eye is medium, and the fruit has few seeds and is very sweet. Fruit ripens from late July through August and is good fresh or processed.

**Black Spanish** (California Brown Turkey, San Pedro): This cultivar yields medium-sized, purplish-brown fruit with a red center. Black Spanish has an eye open. Fruit ripen in June and in August.

**Brown Turkey** (Brunswick, Eastern Brown Turkey, Harrison, Lees Perpetual, Ramsey, Texas Everbearing): This cultivar is probably the most popular fig in the southeastern United States. A small crop of fruit in the spring (called breba fruit) ripens in July followed by the main crop one month later. The fruit is medium-large in size, has bronze skin and amber pulp. The fruit has a small-to-medium ostiole and is good fresh or processed.

**Celeste** (Blue Celeste, Celestial, and Little Brown Sugar): This cultivar is probably the second-most common fig in the southeastern United States. Celeste is fairly cold hardy, and the fruit is small to medium in size and purplish-bronze to light brown in color. Celeste has a closed eye and begins ripening in early July. Celeste is good fresh or processed.

**Champagne** (Golden Celeste): This newly released cultivar from Louisiana State University produces a medium-sized fruit with yellow skin, tan colored pulp and a closed ostiole. Fruit ripening is early July.

**Conadria** (Genoa): This cultivar is a vigorous tree that produces fruit that are green to yellow in color. Flesh of the fruit is pink to red with a good

flavor. The eye is small and tight. Fruit ripening is in June and again in August. Conadria fruit are good fresh and excellent dried.

**Green Ischia** (Ischia Green, Ischia Verte, and White Ischia): This cultivar produces a green small to medium sized fruit with a strawberry center and a closed eye. Fruit of Green Ischia ripens in late July to early August.

**Hunt:** This cultivar is very cold hardy and produces a small pear-shaped, violet-brown fruit with a long neck. Hunt has a closed eye, amber-colored flesh and few seeds; fruit ripen in July.

**Jelly** (Mary Lane Seedless): This cultivar produces a long-necked, yellow fig that is medium in size with clear amber flesh and very few seeds. Fruit of Jelly is good for eating fresh and preserving although the skin is soft. Jelly ripens in late July to August.

**Kadota** (Florentine): This cultivar produces a medium-large, yellow fruit with an open ostiole that is partially sealed with a honey-like substance. Fruit quality declines with extremely wet weather. Although Kadota figs can be eaten fresh, they are better suited for canning and preserves. Fruit ripening is July.

**LSU Gold:** This cultivar is a Louisiana State University release that produces a large, yellow fig with pink-to-red pulp. Fruit of LSU Gold should be picked as soon as it is mature since this fruit has an open eye and fruit spoilage may occur. Fruit ripening is July through August. Fruit is of good quality for eating fresh and for preserving.

**LSU Purple:** This cultivar is a Louisiana State University release that produces a medium-small, glossy purple fig that has amber-to-pink flesh with a closed eye. The main crop ripens in August although some fruit can ripen well into the fall. Fruit is of good quality for eating fresh and for preserving.

**Magnolia** (Brunswick, Madonna): This cultivar is common in some parts of the southeastern United States, but not in Florida. Magnolia is cold hardy down to 50°F, and often produces the largest fig available. Fruit is asymmetric, bronze in color and

has an open ostiole. The flesh is amber to strawberry in color. Ripening is from mid July through August. Fruit should be picked as early as possible since they may split and turn sour under wet conditions. Magnolia is best suited for preserving.

**Mission** (Black Mission, Franciscana): A large, black fig with reddish-pink pulp. Mission is an ever bearing fig that produces fruit from summer to winter. Not sufficiently cold-hardy for the southeastern United States.

**O'Rourke** (Improved Celeste): This cultivar is a Louisiana State University fig that produces a small-to-medium-sized fruit, which is brown in color with tan pulp. The eye is partially closed with the aid of a honey-like substance. Fruit ripening is early July. Fruit is of good quality for eating fresh and for preserving.

**Osborn Prolific** (Arachipel, Hardy Prolific, Neveralla, Osborne, Rust): This cultivar produces a medium-large fruit with reddish, brown skin and light-colored flesh. The fruit is sweet with few seeds. The eye is partially closed. Osborn Prolific is reported to perform better in cooler climates. Fruit ripening is August, and the fruit is best eaten fresh.

**Pasquale** (Natalino, Vernino): This cultivar produces a sweet, small, purple fig with amber-to-pink pulp. Pasquale ripens late November to December and is often damaged by frost. Pasquale is not cold hardy. Not recommended for the southeastern United States.

**Tena:** A medium-large fig that is greenish-yellow in color with light strawberry pulp. The fruit has a closed ostiole. Tena thrives in hot, dry weather. The fruit is good for eating fresh or preserving.

**Tiger** (Giant Celeste): This new cultivar released by Louisiana State University has a large brown fruit, yellow pulp and a partially closed eye. Fruit of Tiger ripens in early July.

**Ventura** (Verdal louange): This cultivar produces a large, green fruit with a long neck. The pulp is deep red with excellent flavor. Fruit ripen from August to September. Fruit may be eaten fresh or preserved.