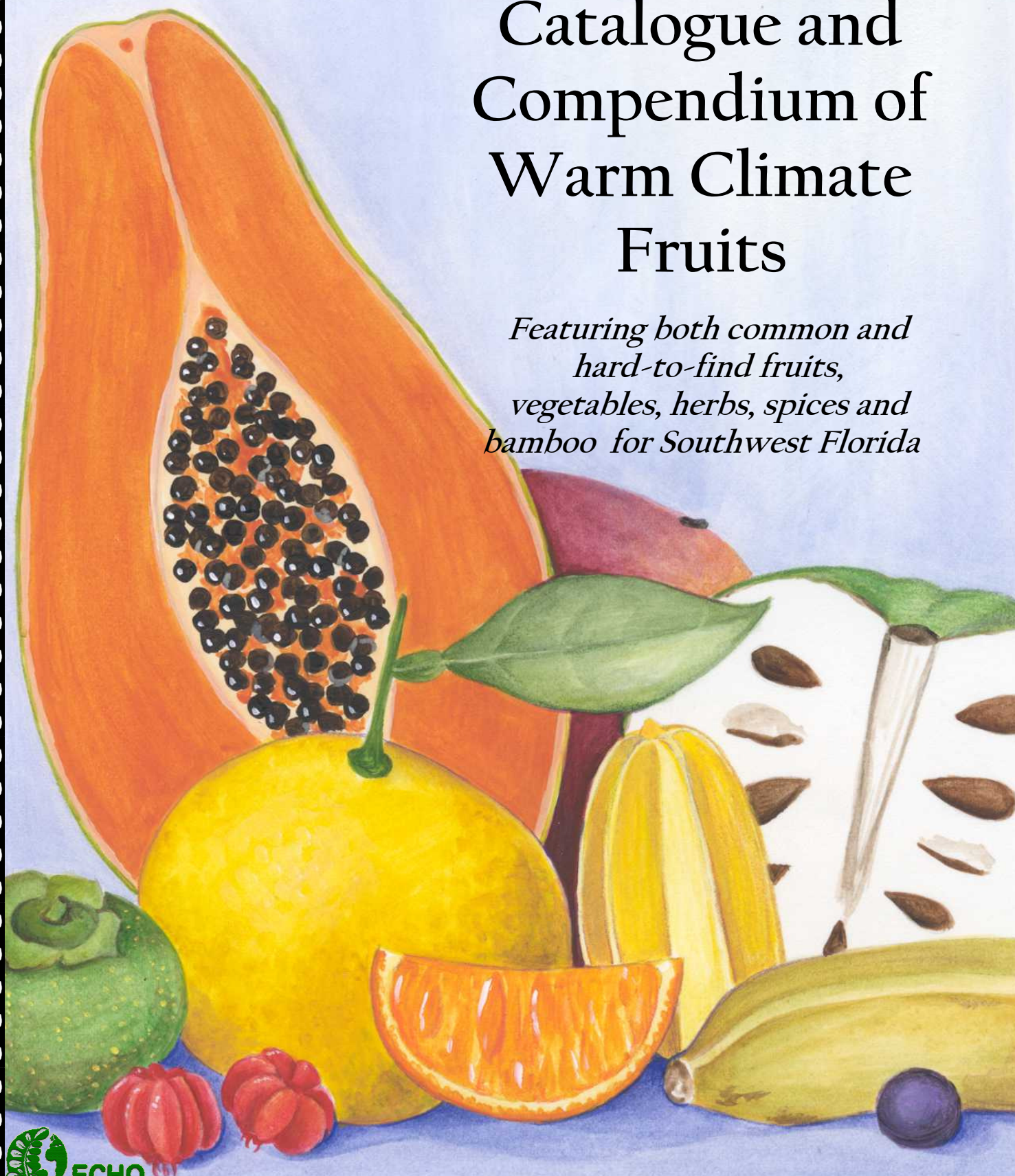


# ECHO's Catalogue and Compendium of Warm Climate Fruits

*Featuring both common and  
hard-to-find fruits,  
vegetables, herbs, spices and  
bamboo for Southwest Florida*



ECHO

Christi A. Sobel 4/2000



# ECHO's

## Catalogue and Compendium of Warm Climate Fruits




*Featuring both common and  
hard-to-find fruits,  
vegetables, herbs, spices and  
bamboo for Southwest Florida*

*D. Blank, A. Boss, R. Cohen and T. Watkins, Editors*

*Contributing Authors:*

*Dr. Martin Price, Daniel P. Blank, Cory Thede, Peggy  
Boshart, Hiedi Hans Peterson*

*Artwork by Christi Sobel*



This catalogue and compendium are the result of the cumulative experience and knowledge of dedicated ECHO staff members, interns and volunteers. Contained in this document, in a practical and straight-forward style, are the insights, observations, and recommendations from ECHO's 25 year history as an authority on tropical and subtropical fruit in Southwest Florida. Our desire is that this document will inspire greater enthusiasm and appreciation for growing and enjoying the wonderful diversity of warm climate fruits. We hope you enjoy this new edition of our catalogue and wish you many successes with tropical fruits!




Also available online at:  
[www.echonet.org](http://www.echonet.org)

## **ECHO's Tropical Fruit Nursery**

Educational Concerns for Hunger Organization  
17391 Durrance Rd.  
North Fort Myers, FL 33917  
(239) 567-1900  
FAX (239) 543-5317  
Email: [nursery@echonet.org](mailto:nursery@echonet.org)

*This material is copyrighted 1992. Reproduction in whole or in part is prohibited.  
Revised May 1996, Sept 1998, May 2002 and March 2007.*



## **Table of Contents**

1.	Fruiting Trees, Shrubs and Herbaceous Plants	2
2.	Trees for the Enthusiast	34
3.	Fruiting Vines & Brambles	37
4.	Tropical Vegetables	40
5.	Herbs & Spices	45
6.	Bamboo	47
7.	Tropical and Subtropical Fruit Ripening Chart	51
8.	Estimated Fruit Yields	53
9.	Tree Planting Suggestions	53
10.	Pruning Fruit Trees	54
11.	Choosing Fruit Trees for Cold Tolerance	56
12.	Drought Tolerance of Tropical Fruit Trees	57
13.	Flood Tolerance of Tropical Fruit Trees	58
14.	Salt Tolerance of Tropical Fruit Trees	59
15.	Edible Landscaping Your Yard	61
16.	Suggested Resources for More Information	63
17.	Plant Index by Common Name	68

“FCFS available” written after the name of a plant indicates that ECHO has a “Fruit Crop Fact Sheet” from the University of Florida giving additional details about that plant. These come with each plant purchased in the nursery. Also a FCFS on “Growing Fruit Crops in Containers” is available. We also have some “Technical Sheets” available if a FCFS is not.

☼ Indicates that this is a variety or a species that is found in our arboretum, but not often stocked in our nursery. Inquire about availability. If we do not have it in stock, we can put you on our “waitlist” and call you when we have it available.



## 1. Fruiting Trees, Shrubs and Herbaceous Plants

### Acerola

see *Barbados Cherry* on page 9.

### Antidesma

see *Bignay* on page 9.

### Apple, Subtropical

*Malus domestica*

**FCFS available.** Low chill apples bear farther south than ECHO in Florida, and may be a unique addition to your yard. Attractive white apple blossoms will appear during Feb-March and give way to fruit (smaller than standard apples) in June. They remain a small tree, growing to about 15 feet. Apples prefer slightly acidic and well-drained soils and perform best in full sun. The trees will need a complete fertilizer with micronutrients and may need to be defoliated by hand in the fall. Prune trees lightly in late winter to promote new growth. Because flowering, fruit development and spring vegetative growth all occur during some of Florida's hottest and driest months (April – June), irrigation is critical for succeeding with apples. To conserve moisture, mulching is highly recommended as long as mulch is not in contact with the trunk. Low chill apples are productive in Florida, but susceptible to anthracnose, fire blight, and root fungus. Apples require cross-pollination with two different cultivars to ensure decent production. The low chill varieties listed below require 50 – 150 chill hours for strong flowering and vigorous growth. Chill units are the number of hours the temperature stays between 32-55° F. Most effective chilling occurs with continuing temperatures below 45 ° F.

'Anna' has red skin and is the most widely planted apple cultivar in Florida. The fruit of 'Anna' resembles that of 'Red Delicious' more than other low-chill apple cultivars. Originally from Israel, this large apple can be eaten green similar to 'Granny Smith,' or can be allowed to ripen to desired sweetness.

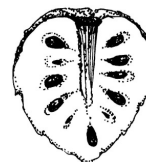
'Dorsett Golden' looks like 'Golden Delicious' with golden skin and sometimes a red blush. This cultivar was discovered in the Bahamas and is crisp and juicy with excellent flavor.

☼ 'Tropic Sweet' is a newly patented variety from the University of Florida. This low acid, very sweet apple has green skin with a red blush, and flavor similar to the 'Gala' apple.

### Atemoya

*Annona squamosa* x *A. cherimola*

**FCFS available.** The Annona family contains many fine tropical fruits. The atemoya is no exception. This superb dessert fruit is one of Dr. Price's (ECHO's director), favorite tropical fruits. Atemoya is the result of a cross between the sugar apple (*A. squamosa*) and the cherimoya (*A. cherimola*). While the cherimoya thrives in cooler temperatures, the atemoya is well-adapted to the lowland tropics and can tolerate a little more cold than the sugar apple. The fruit has fairly thin skin and black seeds. The pulp is white, creamy, yet soft, sweet, and delicious. They are usually eaten fresh, but also make a great milk shake and tasty sherbet. Be sure to remove all the seeds before putting the pulp into a blender because the seeds contain the toxic substance rotenone. The trees produce as early as August and as late as January. Atemoyas reach a height of 25-30 ft. The tree has an irregular, low spreading habit, and is largely deciduous losing most of its leaves in the winter. Pruning is recommended on young trees to develop a desirable shape and to control excessively long shoots. As trees age, a March pruning (while the tree is still without leaves) is recommended for further shaping and size control. The flowers are self-fertile; however, hand-pollination will enhance the fruit set. A June pruning will result in additional flowering and later fruit development. Prune long terminal branches back to 5 or 6 nodes and remove the last two leaves closest to the pruning cut. Flowering should occur on new growth. We have several trees planted in 1996 growing in our arboretum.



'Bradley' is less firm than Gefner, but the flavor and texture are of exceptional quality. ECHO staff preferred Bradley over Gefner in a 2001 taste test. However, Bradley is reported to not fruit very well without hand-pollination.

☼ 'Elly' is very productive like 'Gefner' but produces earlier. It has a creamy pear texture softer than 'Gefner's' firmer texture.

## Fruiting Trees, Shrubs and Herbaceous Plants

‘Gefner’ is a productive, well known variety. It is probably the best for our area and the one we recommend most to customers. Our ‘Gefner’ froze almost to the ground, but grew back and produced about a dozen large fruit the second summer. It has good fruit production without hand-pollination and can be seen in our arboretum.

‘Priestly’ is another very large fruited cultivar. Production does not seem as high as Elly or Gefner. The fruit is of good quality, but does have a slightly grainy texture.

✿ ‘Rosendo Perez’ bears later than most other varieties of atemoya. The fruit is elongated and of good quality. This variety has historical importance in being one of the first atemoya cultivars released by the USDA in the early 1900’s.

### Avocado

*Persea americana*, *Persea nubigena*

**FCFS available.** Avocados are native to Central America and Mexico. From these regions, three distinct races have been recognized: West Indian (WI), Guatemalan (G) and Mexican (M). These races have been crossed to create innumerable hybrids. The ancestry determines cold hardiness, skin texture, and time of fruiting, among other things. The West Indian race is the least hardy (24-28 °F), and Mexican strains are the most hardy (16-24 °F), but do not always fruit well in Florida's humid climate. See **Table 1** for a comparison of other features of these three avocado races.

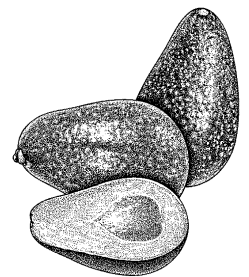
Choosing an appropriate planting location for avocados is extremely important. The first priority is a location that is high and has no history of saturated or flooded soils. Avocados demand well-drained soils, as flooding for 24-48 hours can kill them. They are especially susceptible to *Phytophthora*, a common soil-borne fungus that causes root rot in avocado, papaya, citrus, and other susceptible plants. *Phytophthora* and flooding are a deadly combination for avocado. The second priority is choosing a location with full sun. Much energy from the sun is needed to annually produce the high numbers of large-seeded and oil-rich fruits. They also typically exchange their leaves each year in the spring, resulting in a bare appearance until new growth appears. The third consideration is space. Remember that avocado trees become huge, easily reaching 40’. They can be pruned to control size (immediately after fruit is fully harvested) but their habit is to become large.

Aside from phytophthora, the only other significant problem we encounter with avocados is the Avocado Lace Bug (*Acysta perseeae*) that feeds on the underside of leaves, causing brown blotches and premature leaf drop. Populations are especially high in late fall and, if possible, they should be controlled to prevent spread to newly emerging spring growth.

Avocados are of two flower types, A and B, depending on when they are shedding pollen. A-type flowers shed pollen in the afternoon, B-type flowers shed pollen in the morning. There are different theories about avocado pollination, but recent research seems to demonstrate that self-pollination is the norm, meaning that only one tree is necessary for fruit production.

**Table 1.** Growing conditions and fruit features for three avocado races.

Characteristic	Mexican	Guatemalan	West Indian
<i>Cold Tolerance</i>	Most tolerant	Moderately tolerant	Vulnerable
<i>Salt Tolerant</i>	Vulnerable	Fairly tolerant	Tolerant
<i>Skin</i>	Thin and Waxy	Thick and Rough	Thin and shiny
<i>Oil Content</i>	High	Average	Low
<i>Flowering to harvest</i>	7-9 months	10-12 months	5-7 months
<i>Shape</i>	Elongated	Round	Elongated
<i>Size</i>	Small	Variable	Variable to large



Gaillard and Godefroy, “Avocado”, *Tropical Agriculturalist Series*, pg. 14

‘Beta’ July to September, mid season fruit, 1- 1 ½ lb fruits, highly recommended for commercial planting, rounded, densely foliated canopy, consistently high producer. However the fruit is not of excellent quality.

‘Brogdon’ (A and B type), a M × WI cross, is productive and hardy to 22° F. It is the most cold hardy variety we commonly stock in our nursery. Bears small smooth black-skinned fruits (8-14 oz.), with high quality green flesh. For those looking for a ‘California’ or Mexican type similar to ones found in the grocery store, Brogdon is a good choice. Its strength is its cold hardiness and excellent, rich flavor. Drawbacks include a large seed and paper thin skin which makes fruit difficult to peel. Brogdon ripens July-Sept.

## Fruiting Trees, Shrubs and Herbaceous Plants

‘Choquette’ (A type), a G x WI cross, is oval-shaped and large (24-40 oz.). Skin is glossy, smooth, and slightly leathery. The smooth flesh is of an excellent quality with 13% oil and a mild nutty flavor. Choquette is similar to Monroe in fruit size and quality; both are excellent choices for those interested in a very good-tasting, large ‘Florida pear’. The Choquette has an open, spreading growth habit. Freeze damage in established trees occurs around 26° F. Season is Nov-Jan. with heavy bearing in alternate years.

✿ ‘Custer’s Red’ originated as a seedling on Pine Island in southwest Florida. It is very cold hardy and was not damaged in 24° F temperatures. The fruit is medium-sized (14-24 oz.), oval, and has a mild flavor. We rarely stock this variety since ECHO staff find the flesh watery tasting. Both the mature fruit and new foliage have an attractive red blush. Fruit is ready for harvest when red blush appears; pick early and let fruit ripen off the tree. Bears Oct-Nov.

‘Day’ (A type) is a G x WI cross. Fruit is small (8-16 oz.), pear-shaped with an excellent rich, nutty taste. Skin is green and dull. The tree is very productive and cold hardy; Dr. Price’s tree in North Ft. Myers, FL survived the terrible freeze in 1989 with little damage while a nearby avocado was killed. Bears Aug-Sept.

‘Donnie’ (A type), a WI type, is cold sensitive. It is the earliest commercial variety (May - June) and bears large fruit (greater than 1 lb). They are extremely mild, to the point of being bland. Its popularity is due to its early season.

‘Expedition’ (Unknown flower type) likely has Guatemalan heritage. The round fruit is medium to large (bigger than Lula), with dull, dark green skin and contains a large seed. David Fairchild selected this high quality cultivar but much remains unknown about this cultivar. Expedition bears Nov-Jan., but the fruit can hang on the tree through February.

✿ ‘Fuerte’ (B type) is a M x G cross commercially grown in many regions of the world. The fruit is small (12-14 oz.) with dark green bumpy skin. This cultivar is better suited to drier climates—a wet summer can cause the fruit to rot. This variety is not recommended for Florida. Bears Nov-Dec.

✿ ‘Kampong’ (B type) is a Guatemalan race with high cold tolerance, but low yields. It bears a green fruit (14-24 oz) from Dec 1 to March 31.

‘Lula’ (A type), a G x WI cross, produces medium (14-24 oz.), pear-shaped fruit with nearly smooth skin. Lula has a large seed and is slightly sweet with good flavor. Formerly grown commercially, it is a good producer, but very susceptible to scab (a disease which only harms the appearance). Lula is hardy to central Florida most years, freezing at about 25° F. Bears Nov-Jan.

✿ ‘Marcus Pumpkin’ has very high cold tolerance, a moderate yield and a *huge* fruit – the fruits can weigh over 3 lbs. The flavor is very mild and is often described as watery. Its main appeal is its very large fruits. It bears Oct 15 to Nov 30.

‘Miguel’ 1 ½ - 2 lbs fruits, fruits August to September, is large, productive and of excellent eating quality.

‘Monroe’ is a G x WI cross grown commercially in the Miami/Homestead area. This variety is prolific, consistently bearing large fruits that mature in the fall. Flesh is of very good quality lacking the watery texture often found in other large fruited types. Monroe’s growth habit is upright, rather than spreading and is cold hardy to 26°F. Monroe bears Nov-Dec.

✿ ‘Russell’ (A type) a West Indies avocado, is fairly frost sensitive. The fruit is 12-18 inches long, club-shaped, often weighing between 16-24 oz. It has smooth, glossy, green skin, and a small seed. This cultivar yields well and is of high eating quality. Russell bears July-Aug.

✿ ‘Tonnage’ (B type) belongs to the Guatemalan race. Fruit is medium sized (14-24 oz.), green, and has thick, rough skin. Production is good, but flavor is very mild and inferior to many other varieties. Freeze damage in established trees occurs around 26° F. The tree is tall, upright, and in SW Florida bears Sep-Oct.

✿ ‘Wurtz’ (unknown flower type) is of Guatemalan race and was discovered in California in 1935. Fruit is small pear-shaped, with a large seed and rough green skin similar to California avocados. Wurtz has rich flavor and is of high quality. The tree is slightly dwarfed for an avocado, is cold hardy, and bears moderately but consistently in Nov-Dec.

✿ ‘Winter Mexican’ (B type) is a Mexican x West Indies cross. Fruit is small (12-16 oz.) and oval with dark green, rough skin. The fruit quality is not as good as most of the other varieties we carry, thus it is not a recommended variety. The tree is large, attractive, and very frost hardy (to 22° F). Bears productively Oct-Dec.

## Fruiting Trees, Shrubs and Herbaceous Plants

### Manager's Choice – Avocado

For those who prefer small California/Mexican types as found in grocery stores:

1. Brogdon
2. Lula

For those interested in large fruited types typically grown in Florida (a.k.a Florida Pears):

1. Monroe
2. Choquette

**Table 2.** Fruiting seasons in southwest Florida for avocado varieties, as described in the text on pages 3 to 4.

Variety	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Brogdon												
Choquette												
Custer's Red												
Day												
Donnie												
Expedition												
Fuerte												
Kampong												
Lula												
Marcus Pumpkin												
Monroe												
Russell												
Tonnage												
Winter Mexican												
Wurtz												

### Bamboo

see section on Bamboo starting on page 47.

### Banana and Plantain

*Musa* sp.

**FCFS available.** Bananas are easy to grow in SW Florida, quickly giving a tall plant with a lush tropical appearance. Plantains are varieties used for cooking when green or ripe. They are starchy and have a lower moisture content than bananas. Plantains are not as cold hardy as most banana varieties and are more difficult to grow in SW Florida. Ripe plantains are good in breads or cakes and don't turn dark like regular bananas. Bananas and plantains are not true trees, but rather herbaceous plants. They grow as a cluster of stems originating from the same underground rhizome called a corm. They are useful at a new home where vertical height is needed quickly while slower growing trees gain size. However, they can look brown and tattered during the coldest couple of months. If there is a hard freeze the clump will come back, but a year of production may be lost.

The part that looks like a trunk is made up of tightly packed concentric layers of leaf sheaths, actually called a 'pseudostem'. This pseudostem begins as a sprout, or 'sucker', emerging from buds along the underground rhizome. Over time suckers elongate into stems and usually after a year or more and a certain number of leaves are produced, the terminal bud emerges, enveloped in a long purple sheath. The female flowers are the first to appear. The immature green fruit develops at the base of these flowers for the next several months. Hands of hermaphroditic flowers appear next, shortly after the female flowers, producing small, undeveloped, and useless fruits that eventually fall off. The large purplish red bud continues to elongate, revealing the functionally male blossoms. Some recommend removing this bud, thinking that it may take nutrients from the fruit. We consider it a matter of preference. On a large plantation bananas are the male flower, the false hands and 1-2 of the smallest hands closest to the bud are removed to speed up time to harvest and to increase finger length.

## Fruiting Trees, Shrubs and Herbaceous Plants

At the home level, one will probably not notice the difference. Besides, if left it provides nectar for bees. However, if the fruiting stalk is leaning severely, it may help to remove the excess weight of the flower.

Once a stalk has fruited, it will die and should be cut down to provide more room for the side shoots. This can be done easily with a machete. The cut leaves and stem can be left as mulch around the base of the other stems. They respond well to lots of fertilizer and irrigation. Short periods of flooding are tolerated by some varieties, but others may be killed.

Bananas are not uncommon in Florida yards, but it is much less common to see banana mats properly cared for and managed. They usually survive but do not thrive, on neglect. They grow quickly, requiring frequent fertilizer applications during the warmer months and consistent irrigation during the dry months, and mulch year round. This is the key to success with bananas: lost of fertilizer, irrigation and mulch throughout the year.



A note on banana availability— due to the recent introduction of the fungal banana disease ‘Black Sigatoka’ into Florida, we will be selling only three varieties of banana and plantain that are known to be resistant to the disease. Once the extent of the disease and the susceptibility to Black Sigatoka of the other varieties is determined, we may start selling them again in a few years.

We have most of these varieties planted out in various locations on our property. Ask to see a mature specimen if you like.

### Available 2007:



‘Gold Finger’, aka ‘FHIA-1’, developed in Honduras for disease resistance, demonstrates greater tolerance to drought, cold spells, and nematode attack than most varieties. It can support 100 lbs. of fruit without propping and produce a raceme in under a year. Fruit is slightly tart, and will not turn brown when diced. It is good eaten fresh or used in cooking. This hardy variety performs very well at ECHO and is extremely productive and easy to grow. It is not as sweet as most bananas, but it is very tasty.

‘Misi Luki’ is an excellent dessert banana. Beautiful green foliage, and highly disease resistant. Fruits are about 4 inches long (your classic finger bananas) intensely flavored - smooth creamy banana flavor. Misi Luki will grow to about 12-15 feet outdoors.

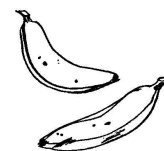
‘Mona Lisa’ is a Cavendish type banana (like the grocery store type) otherwise known as FHIA 2. Plants 10 to 12 feet tall. Produces good sized bunches of fruit that are best eaten before they are fully yellow.

‘Super Plantain’ is a popular variety, which grows to about 12 feet high. The fruit is terrific and is a staple of Caribbean and Latin cuisine.

**The following varieties are *not* currently available – however, they are represented in ECHO’s collection.**

**Cavendish-type** and **Cavendish-like** bananas are like those that are typically found at the supermarket:

‘Dwarf Cavendish’ grows to 4-6 ft. tall and was considered one of the best varieties for Florida. It is hardy and wind resistant. The fruit is of medium size and good quality. Now ‘Gran Nain’ is a better choice, having the same qualities with higher yield and resistance to cigar end rot.



‘Enano’ is a dwarfed Cavendish cultivar that grows 4 to 6 ft. tall. It is a good commercial variety that bears sweet fruit.

‘Gran Nain’ is the commercial variety most often found in stores. It grows to 5-7 ft. It was derived from Dwarf Cavendish, and is grown on huge plantations in Central America. It is reportedly higher yielding, producing up to 150 lbs. of high quality fruit in the tropics. It also resists blossom end rot that can occur on Dwarf Cavendish. Gran Nain is, however, susceptible to Black Sigatoka, reducing its productivity in Florida and requiring aerial fungicide sprays on commercial plantations.

‘Ice Cream’ or ‘Blue Java’ is a vigorous plant at ECHO and grows 14 to 18 ft. It is very hardy and has good cold tolerance. The fruit is medium length, wedge shaped and bluish green until ripe, then it turns yellow. The flesh is snow white and sweet. Susceptible to disease, therefore Nam Weh may be a better choice.

‘Jamaican Lacatan’ was formerly the ‘Chiquita’ banana. It grows to 15 ft. and has great tasting fruit. The stem is fairly thin and needs to be propped up to support the fruit. Will bear after 16 months. Excellent quality fruit.

## **Fruiting Trees, Shrubs and Herbaceous Plants**

‘Valery’ or ‘Robusta’ is a commercially grown Cavendish variety and reaches about 10 ft. It produces large heads of high quality fruit. Valery has proven both hardy and productive at ECHO. Very similar to grocery store types.

‘William Hybrid’ grows 6 to 8 ft. and is wind resistant and cold hardy. The Cavendish fruit is large and sweet with large bunches weighing up to 150 lbs.

**Lady Finger-type** bananas are short, sweet, and fat. They make an excellent dessert banana:

‘Apple Banana’ is a favorite dessert banana and grows 10-12 ft. tall. Fruits are 4-6 inches long, plump, and firm. When fully ripe, the fruit has a very good sweet sub-acid apple flavor. However, ripening may occur several days even after yellow color change in skin. Yield is not very high, and plant is very susceptible to Panama disease.

‘Brazilian’ is a very tall banana, quickly growing to 18 or 20 feet. It is wind tolerant and has very good quality fruits that are creamy and one of the sweetest bananas. Fruit can be allowed to ripen on or off the plant. Excellent dessert banana.

‘FHIA-18’ is a hardy, semi-dwarf, apple-flavored dessert banana resistant to Panama disease and nematodes and tolerant to Black Sigatoka. As with the ‘Apple’ Banana, the fruit must be fully ripe before eating. FHIA-18 is being grown commercially in Cuba. It is still under evaluation at ECHO before propagating it to sell (Summer 2002)

‘Golden Pillow’ grows 10 to 12 ft. and has moderate wind tolerance. The fruit is short and fat with thin skin; it is nearly identical to its parent, the ‘apple banana.’ However, Golden Pillow can be eaten before ripe without any acidity or apple flavor. The flesh is very sweet and is a favorite in SE Asia. It is also susceptible to disease.

‘Mysore’, ‘Strawberry’ is a ladyfinger type of banana hailing from India. This red tinged plant grows 12 to 14 ft., and bears quickly. The bunches of yellow fruit are tightly packed, thin-skinned and very sweet with a hint of strawberry flavor. It is fairly wind tolerant, vigorous, and productive. It is resistant to nematode and corm borer attack as well.

‘Niño’ or ‘Honey’ grows 10 to 12 ft. tall and produces one of the sweetest ladyfinger bananas. Fruit is 2 to 3 inches long, thin skinned and plump. Stock should be harvested green because bananas are prone to splitting. The plant has slender leaves of a bright, almost glowing green color. Niño is drought sensitive and does not produce large heads of fruit.

‘Praying Hands’ is a unique cultivar from Indonesia. Each individual banana is fused together in a hand. Fruit is very sweet with a hint of vanilla. Fruit can ripen on the stock without splitting and individual bananas will easily pull apart from the fused mass when they are yellow with ripeness. This vigorous sturdy banana produces both fruit and suckers frequently.

‘Rajapuri’ is a sweet dessert banana with smooth and creamy flesh. It is a hardy variety resistant to disease, nematode and corm borer attack, and can survive a light frost with leaves intact. The plant grows 6 to 8 ft. tall and is very wind resistant. Fruit size and production is medium, however stock will bear in less than one year. Rajapuri is one of the favorite bananas of India and an excellent choice for the dooryard enthusiast; however it is very susceptible to black Sigatoka.

‘Thousand Finger’ grows up to 12 ft. It produces a long bunch with 1 in. fruits. There may be up to 1000 fruits in a bunch. The flower bud keeps setting fruits as long as the plant can nourish it.

**Plantains** are used for cooking:

‘African Rhino Horn’ grows to about 12 ft. and produces two to four hands of fruit. The fruits are usually 12-14 inches in length, but can grow to 2 ft. and weigh as much as 3 lbs. each. The Rhino Horn has leaves and a pseudostem that is dappled red. The fruit is good for cooking and eating out-of-hand. Rhino Horn is a favorite of corm borer pests.

‘Dwarf Puerto Rican’ is a plantain that grows 6-8 ft. tall. It has a distinctive bronze colored trunk and leaves. Plant in a warm and well-protected site with optimal growing conditions.

‘FHIA-3’ is a disease-resistant cultivar that doubles as both a dessert banana and a cooking banana. It is now grown commercially in Grenada and Cuba (where it is used primarily as a ripe dessert banana). The plants are hardy, semi-dwarf, sturdy and productive, resistant to black Sigatoka, Panama disease, and Moko disease and tolerant to nematodes. After evaluation at ECHO this may be made available for sale (summer 2002).

## Fruiting Trees, Shrubs and Herbaceous Plants

‘FHIA-25’ is a hardy, semi-dwarf cooking banana that is highly resistant to black Sigatoka. This hybrid is for cooking green only. Rated by consumers in Honduras as being equal to or better than boiled and fried plantains.

‘Hua Moa’ or ‘Hawaiiano’ is a banana-plantain cross that grows 10 to 12 ft. and is produced commercially on the E. Coast of Florida. The ‘melon-shaped’ fruits are 6 to 11 in. long and 3 in. or more in diameter. The orange flesh is good for eating fresh and highly esteemed in Cuba as a cooking banana for making tostones. Remove the stalk before it ripens or the fruit will split as it yellows.

‘Kau Lau’ is a vigorous Hawaiian plantain growing to 16 ft. tall. This cultivar produces large bunches of excellent cooking bananas.

**Specialty Bananas** are multi-purpose bananas and plantain x banana crosses:

‘Dwarf Colorado Blanco’ grows 7 to 8 ft. Trunk, petioles, and midribs resemble the Jamaican Red, but the fruit is orange-fleshed, while the skin is green and ripens to yellow. May take up to 18 months

‘Dwarf Orinoco’ resembles its taller progenitor (‘Orinoco’ Plantain, see below under **Specialty Bananas**), except for bearing larger racemes of fruit. Standing only 6 to 7 ft., this hardy cultivar is thought to be the most productive variety per square foot.

‘Dwarf Jamaican Red,’ a smaller form of the ‘Jamaican Red’, bears more quickly and grows only 7-8 ft. tall to bear fruit.

‘Giant Pisang’ grows 20 to 30 ft. If a compatible banana is flowering the fruit will be full of hard, indigestible seeds. This sturdy vigorous cultivar may grow 60 to 80 ft. in the jungle and has a beautiful pink flower.

‘FHIA-17’ is a hardy semi-dwarf dessert banana similar to Cavendish in size and flavor. This hybrid is resistant to Panama disease and the banana root borer insect and tolerant to black Sigatoka. It is still under evaluation at ECHO.

‘Jamaican Red’ grows 16 to 18 ft. tall and has a red stem. The short, fat fruit is red with orange flesh and is a delicious dessert banana. Fruit production is slow—up to 18 months. It can withstand some wind but not flooding.

‘Kru’ This rare variety was imported from the jungles of New Guinea, where it has become extinct. The plant has a beautiful reddish stem and leaves. The red fruit is 5-6 inches long, wedge shaped, and orange-fleshed. Reported to be one of the best tasting bananas. The plant is moderately wind resistant and sensitive to drought and cold.

‘Nam Weh,’ a Thai banana, produces angular fruit with excellent sweet flavor. Fruit, growth habit, and hardiness are very similar to the ‘Ice Cream’ banana, but Nam Weh is disease resistant and lacks the silvery-colored peel.

‘Red Iholene’ grows 14 to 16 ft. Iholenes are Polynesian banana-plantain crosses that ripen faster than any other cultivar. The stalk and leaf undersides of Red Iholene are a beautiful burgundy color. The fruit emerges yellow and in 7 weeks is salmon colored and ready for harvest. The flesh is orange, fairly dry, and excellent for eating fresh or use in cooking.

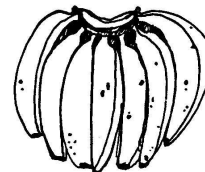
‘Orinoco’ or ‘Burro’ or ‘Horse’ grows to 10-12 ft. This dual-purpose banana is delicious when used like a green plantain or eaten fresh when ripe. The fruit tastes best when left on the plant until yellow. The angular fruit is 8 to 10 inches long and thick. Long established in Florida, this hardy variety can endure wind and cold. Orinoco needs to be supported when carrying large heads of fruit.

‘Philippines Lakatan’ is the most highly esteemed fruit in the Philippines. The plant grows to 18 ft. tall and produces medium-sized fruits that are 5-7 inches in length.

‘Pisang Raja’ is a sturdy plant, tolerating cold and wind, growing to 20 ft. It is one of the most delicious bananas and has orange-fleshed, slightly fuzzy fruit that are between 6 to 7 inches long. It is the most productive of the orange-fleshed bananas.

‘SH3640’ is a selection from the FHIA research station in Honduras. Resistant to nematodes, it was used for breeding purposes. Unfortunately, it is susceptible to black Sigatoka. They are sturdy, productive plants that produce an even higher quality fruit than Goldfinger. They are similar to Goldfinger in the robust growth habit and height.

‘Tuu Ghia’ grows 14-16 ft. tall. This Vietnamese variety bears long, thin, unusually curved bananas. This vigorous and productive plant has outstanding and unique flavor reminiscent of “Starburst”™ fruit chew candies.



## Fruiting Trees, Shrubs and Herbaceous Plants

### Barbados Cherry (Acerola, West Indian Cherry)

*Malpighia puniceifolia*

**FCFS available.** One of the richest sources of vitamin C, a single small fruit of some selections could supply the daily adult requirement of this vitamin. Varieties differ in sweetness. The tart varieties have more vitamin C than sweet ones and unripe fruit tends to have more vitamin C than ripe fruit. The tree may have 3-5 crops a year, with the first flowering usually taking place in April and fruit maturing 45 days later. It will continue to bear until October or later. Production starts the second year after planting. Nematodes can reduce its vigor if not planted in rich soil. Freezes kill it back but it can re-sprout. We have several shrubs growing in the "Tropical Cherry" row next to the Appropriate Technology area.

'ECHO Sweet', our own variety, is tangy and mildly sweet.

'Florida Sweet' is considered a superior variety with an upright growth habit, large fruit, thick skin, semi-sweet flavor and high yield.

✿ 'Manoa Sweet' is slightly tart with very good flavor.

### ✿ Bignay (Antidesma, Chinese Laurel)

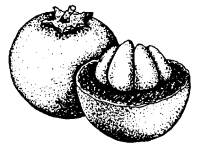
*Antidesma bunius*

Bignay produces showy drooping clusters of 1/3 inch fruits that can be made into jams or wine or are eaten fresh. They are small, seedy, sub-acid and slightly sweet when ripe and have a thin, tough skin. They taste very bitter to some people. In some countries the leaves are eaten cooked with rice. The tree has dense foliage and is variable in mature size, ranging from 10' - 100' (in the tropics), but in Florida they rarely exceed 25'. Seedling trees bear either male or female flowers. Female trees can begin producing fruit in 2 years, but require cross-pollination from a male tree. The fruit does not all ripen at once and some trees bloom earlier than others so harvest ranges from late summer through winter. Bignay should be hardy up to central Florida.

### Black Sapote (Chocolate Pudding Tree)

*Diospyros digyna*

Black Sapote produces a round, slightly flattened, green skinned fruit that is soft when ripe. The flesh has a texture and color similar to whipped chocolate pudding. The flavor is sweet and mild, with a hint of persimmon to which it is botanically related. Serve chilled. The fruit pulp is often mixed with other juices. Fruits usually ripen December to March (but some trees may produce June to August). This handsome evergreen has thick foliage, a wide crown, and will grow quickly to a height of around 45 ft. in Florida. Fruit production usually starts in 3-6 years. Unpicked fruit falls and splatters on the ground. It does well without any cultural attention, but does benefit from fertilizer. Temperatures of 28-30° F can be tolerated for short periods once the tree is well established.



Seedling propagated trees may result in completely male trees that bear no fruit. Therefore we try to sell only grafted trees from proven sources. We are currently carrying a variety from the home of Richard Wilson, owner of Excalibur Fruit Trees in West Palm Beach. This variety is superior to most others, producing heavy crops of large, pleasantly sweet and very creamy textured fruits that are often seedless.

We have mature trees (planted 1996) in the north side of the arboretum.

### Blueberry

*Vaccinium corymbosum*

**FCFS available.** As with blueberries in the wild, this one requires an acid soil with high organic matter content. Blueberries are shallow rooted, drought sensitive, and respond favorably to mulch. A 6-inch mulch layer will reduce soil temperature by as much as 10 degrees and hold moisture. A severe post-harvest summer pruning will promote a new flush of growth that will remain evergreen throughout the winter. Failure to prune blueberries will result in sickly, unproductive plants. Fertilize bushes lightly and frequently with an acid fertilizer; they cannot tolerate a heavy dose. Provide several applications of elemental sulphur each year to reduce soil pH. Cross-pollination between varieties is recommended for better fruit set and quality. We recommend plucking flowers during the first two growing seasons to concentrate plant energy toward vegetative growth rather than fruit production. ALL BLUEBERRIES REQUIRE AN ACID, MOIST SOIL. We carry at least two southern highbush varieties that will cross-pollinate and produce in SW Florida.

'Emerald' was released by the University of Florida in 1999. It is a vigorous, upright, bush with potential for high yields, ripens early and produces large, high-quality berries.

## Fruiting Trees, Shrubs and Herbaceous Plants

'Gulf Coast' is a 1987 USDA release. Bears sweeter fruit than 'Sharpeblue', and have a higher chilling requirement. Its dark green and narrow leaves make it an attractive plant. The fruit quality is very good. Highly recommended.

'Jewel' is a recent release from the University of Florida. It is an early-ripening variety with a low chilling requirement and high quality berry. It is similar in quality to 'Sharpeblue', but ripens earlier. It is productive, vigorous, and slightly spreading. It has good resistance to root rot and leaf diseases. It yields a large, sky-blue, firm, slightly tart fruit. Chilling requirement is estimated at 250 hours, but it is still recommended for South Florida.

'Misty' is also a University of Florida release. 'Misty' tends to set too heavy a crop and can have weak vegetative growth. Fruit are large and excellent in quality; foliage is deep green and leathery,

'Sharpeblue' bears medium-sized fruit in mid to late April—one of the earliest blueberries to ripen in North America. However, blossoms and early fruit set may need freeze protection.

### Bullock's Heart

see *Custard Apple* on page 17.

### Bunchosia

see *Peanut Butter Fruit* on page 28.

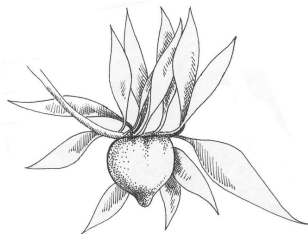
### Caimito (Star Apple)

*Chrysophyllum caimito*

Caimito produces a round, purple fruit 2-4 inches in diameter. The skin and rind are inedible and contain latex, but the pulp is soft, purple and white, and sweet. It is good eaten fresh or mixed with other fruits. The tree is beautiful with bronze leaf undersides and does well in any well-drained soil. It fruits in five to ten years from seed or possibly the first year if grafted. Fruit may be produced from late winter or early spring to early summer. Fruit is often lost due to defoliation from cold. Mature trees are seriously injured at 28° F and young trees may be killed by a short time of 31° F. We have a tree planted in our arboretum and another in the landscaped area between our library and office building.

### Canistel (Eggfruit)

*Pouteria campechiana*



**FCFS available.** Canistel is also called eggfruit since the flesh resembles a hard-boiled egg yolk in color and texture. The fruit is usually sweet and some varieties have a musky aroma. The fruit is good eaten fresh or made into delicious eggnog-like milk shakes by blending with milk. The fruit is high in niacin and carotene and moderate in vitamin C. The tree seldom grows to more than 25' high. It tolerates poor soils and may even fruit better on thin soils. Trees are almost always healthy and nearly pest-free. Fruit production starts in 3 to 6 years from seed and sooner from grafted trees in December through May. A tree in a 30-gallon pot at ECHO has produced well for several years. Young trees can be killed if temperatures drop

below 29°F; mature trees can withstand 23°F for a short time. There are trees located in the east end of ECHO's arboretum.

'Bruce' This cultivar fruits August - October and February - March. Fruits have dry flesh, are large and of good eating quality.

'Trompo' (formerly 9681) is a University of Florida selection. The fruit is large, sweet and has excellent texture.

### Carambola (Star Fruit)

*Averrhoa carambola*



**FCFS available.** This is one of the most productive fruit trees. If you only know the sour fruit from backyard seedling trees, be sure to try the sweet grafted varieties! Fruit from grafted trees is one of the fastest growing new exports from Florida. Cross sections of the fruit make attractive yellow stars, giving rise to its alternate name of star fruit. Carambola has a thin skin and crisp, juicy, non-fibrous flesh. Usually there are two major blooms - one in April - May and another in September -

## Fruiting Trees, Shrubs and Herbaceous Plants

October, with harvests June through February with peaks during August - October and December - February. The fruit can be eaten fresh, juiced, canned or dried. Under good conditions, mature trees can yield 200-300 lbs. of fruit per year. Flowers are small, pink and showy and attract a lot of bees. Seedling carambola trees can become large (ECHO has one over 30 feet). But they will fruit when young and even in a container. Soil should be well drained and slightly acid. Irrigation during drought is beneficial. Temperatures of 29° F can kill young trees. Large trees only lose leaves and small branches with short periods of 26-28° F. Our trees at ECHO produced fruit during the summer of 1997 after suffering extensive damage from the January freeze when temperatures stayed between 24-26° F for over 8 hours. Carambola will thrive in partial shade. The ridges of the fruit have concentrated levels of oxalic acid and should be cut off when serving the fruit. You can see several seedling trees to the north of the entrance to the nursery parking lot, and sweet varieties of grafted trees are near the duck pond, west of Mount Victor.

‘Arkin’ is the dominant cultivar in South Florida carambola orchards. Though lacking a deep orange color, yields are high, flavor is good and it handles shipping better than most other selections.

‘Bell’ bears large. Yellow-skinned fruit of excellent quality and flavor. The fruit are deeply winged and thus are susceptible to wind damage and scarring. Highly recommended for home production.

✿ ‘ECHO #1’ is a seedling of ‘Arkin’ but looks more like ‘Fwang Tung’ with its pale yellow color. From initial evaluation in 1994 it is sweeter and has better flavor, but less color than the commercial variety.

‘Fwang Tung’ is a non-acid, pleasant tasting cultivar that bears short, stout, arrowhead-shaped fruit that is somewhat asymmetrical. The skin is light yellow when ripe, but Fwang Tung is mild enough to be eaten when green, as is the preference in some cultures.



‘Hart’ is a white-skinned cultivar, pearlike in flavor, described as sweet and delicious. Fruits are small and delicate. Trees are small and easy to manage.

‘Kary’ is sweeter than ‘Arkin’ and has more color and better flavor. Fruit is long and very juicy, but it is less crunchy than Arkin and Sri Kambangum. Skin is bright orange-yellow and of high-quality. Kary was selected at the University of Hawaii from a Malaysian clone. Highly recommended

‘Sri Kambangum’ looks similar to ‘Arkin’ with gold-coloring and uniform shape. Fruit is crunchy, and very sweet. It may become the new leading commercial variety. Local Nursery owners rate this variety number one.

### ✿ Carissa (Natal Plum)

*Carissa macrocarpa*, *Carissa grandiflora*

If you are in the market for a fruiting security shrub, carissa is a good candidate. Native to South Africa, and growing to 15 feet tall, it is loaded with small sharp thorns. Carissa leaves are ovate, glossy, dark green and leathery. The small, yet attractive white flowers are borne for much of the year, but flowering and fruiting is most heavy from May to September. The fruit, up to 2 ½ inches in length, is oblong in shape, tender and juicy, with a hint of strawberry taste. If eaten when unripe, the latex in the fruit is rather unpleasant. When ripe, the fruits are magenta-red in color, and make good jellies and pies. Carissa tolerates both flooding and drought, and mature plants can tolerate 26° F.

### Cattley Guava (Strawberry Guava)

*Psidium cattleianum*, *syns. Psidium littorale; Psidium chinense*

Cattley Guava is one of the most outstanding edible hedges for Southern Florida as it is cold hardy to about 22° F. The red cattley guava tends to be a compact, bushy shrub whereas the yellow cattley guava has a more upright and open growth habit. Both make very nice container plants, as they will bear heavily in a pot. The fruits are about one inch long and are aromatic, spicy, subacid, and strawberry-like. They are not musky like regular guavas, but are seedy. They can be eaten fresh or made into jam, jelly, butter, or sherbet. The plant likes limestone and poor soils, but may produce more if grown on good soil and mulched. Fruit flies often attack the fruit. It tolerates a high water table, but may be killed by flooding. We have several trees on our property, some located in the landscaped area between the office building and the library.

### Cherry of the Rio Grande

*Eugenia aggregata*

**FCFS available:** “Selected Eugenia Species.” This fruit is somewhat similar to sweet cherries in flavor. The fruit is about one inch long, has a thin, tender, dark red skin and ripens April through June. Fruiting starts in about 2 to

## Fruiting Trees, Shrubs and Herbaceous Plants

5 years. This evergreen tree grows to about 15 feet has upright growth and attractive foliage and bark. It can survive short periods of 20° F. It is the most cold tolerant of ECHO's Eugenia species (Surinam cherry, pitomba, etc).

### Chinese Laurel

see *Bignay* on page 9.

### Chocolate Pudding Tree

see *Black Sapote* on page 9.

### Ciruela

see *Red Mombin* on page 26.

## Citrus

**FCFS available.** Southwest Florida is an excellent environment for growing citrus. Trees will perform best in sunny locations and well-drained soil. At ECHO we have over 65 varieties of citrus trees planted. These varieties bear during different months; when you visit ECHO you can taste the fruits that are currently ripe. The following charts will help you choose from the many varieties we sell in the nursery. With only a few trees in your yard, you can have citrus fruit available all year. If you are not a permanent resident, take into consideration the varieties that are bearing during the months that you will be here and select accordingly. If you would like to take a potted tree up north, we have indicated a few trees better suited for container growing. Most if not all of the citrus varieties we carry are planted somewhere on our property. If you like, please ask to see a mature example of the tree you wish to purchase.

**Sweet Oranges** (*Citrus sinensis*) may be one of the most popular fruits in the world. They originate from southern China, southeastern Asia, and northeastern India. These trees may withstand short periods with temperatures as low as 24°F.

Ambersweet	Large fruit with variable seediness that is good for juicing or eating out-of-hand. Flesh separates effortlessly from the rind. Flavor is mildly sweet. Once established Ambersweet is productive, however, homeowners may have to wait several years as young trees sometimes yield low numbers and fruit of variable quality. Bears Oct-Jan.
Blood orange	Medium to large fruit with few seeds. Very good, unique flavor that hints of fresh berries. Striking red flecks throughout flesh. Excellent eating or juicing orange. Highly recommended. Voted best tasting sweet orange by ECHO interns in winter 2002. Bears Feb-April.
Hamlin	Small, seedless cultivar grown widely throughout Florida for juice. Sweet, easily peeled, light colored flesh. Tree is productive, cold hardy, and holds fruit well. Highly recommended. Bears Oct-Jan, but can hold until March.
Navel	Large, seedless fruit most popular for eating out-of-hand. Sections well, peels easily, sweet flavor, low in acid. Superior dooryard choice. Bears Oct-Jan.
Parson Brown	Small fruit containing many seeds. Flavorful, sweet and juicy fruit, but difficult to peel. Fruit hangs on tree after maturity until April or May, providing homeowners with an extended season.
Pineapple	Medium-sized orange with many seeds. Excellent eating or juice orange. Good external and internal color. Subject to alternate bearing and cold temperatures. Bears Dec-Jan.
Red Navel	Medium-sized seedless fruit. Sweet, low acid, Navel orange flavor. Peels easily. Pink flesh is genetically unstable and may cause other variability in plant. In Florida, fruit may be lighter pink because pigmentation is induced by cold weather. Fruit holds well on tree. Small to medium tree that bears Nov-Feb.

## Fruiting Trees, Shrubs and Herbaceous Plants

Rhode Red Valencia	Similar to Valencia in all ways, but flesh has deeper, richer color than Valencia and is being grown more widely for juice in Florida. Bears Mar-June. Highly recommended
Sanguinelli	Small ovate fruit containing few seeds. Rind is the most brilliant of the blood oranges and fairly difficult to peel. Bright reddish orange flesh is refreshingly delicious. Tree is attractive especially when fruiting, compact, and productive. Bears Feb-April.
Valencia	Medium-sized seedless orange excellent for juice and eating out-of-hand. Tree holds current crop and previous season's crop at the same time. Tends toward alternate bearing. Bears Mar-June.
Vernia	An early maturing, Valencia type orange. Bears January- March.

**Tangelos** (*Citrus paradisi* × *C. reticulata*, *Citrus* × *tangelo*) are grapefruit × tangerine hybrids that are often juicy, but do not have a long shelf life. All starred (\*) fruits require a pollenizer tree planted within 100 ft.

*Minneola (Honeybell)	Large bell-shaped fruit containing few seeds. Superb flavor and so juicy that peeling is difficult and messy. Cold hardy and a heavy producer, but tends to alternate bear. Requires another citrus variety for cross-pollination. Bears Dec-March. Interestingly, Minneola is a cross between a Duncan grapefruit and Dancy tangerine. Recommended pollenizers: Sunburst or Temple.
*Orlando	Medium to large sized fruit with variable seediness. Fruit is juicy, sections well, and peels without difficulty. Excellent quality and flavor. Most widely grown tangelo in Florida. Cold hardy. Bears Nov-Jan. Orlando is not an effective pollenizer for Minneola. Recommended pollenizers: Nova, Sunburst or Temple.

**Mandarins** (including Tangerines and Mandarin hybrids) *Citrus reticulata* and **Tangors** (*C. reticulata* × *C. sinensis*): **Mandarins** are a class of thin-skinned, usually easy-to-peel citrus. Traditionally, **tangerines** are red-orange mandarins, but today the name is loosely applied to many different mandarins. **Tangors** are tangerine × sweet orange hybrids. All starred (\*) fruits require a pollenizer tree planted within 100 ft.

Clementine	Small to medium fruit that varies in seediness and peels easily. Flesh is bright orange, juicy, and has rich, sweet flavor. Attractive and compact tree with weeping habit. Bears Nov-Jan.
Dancy	Small tangerine with variable seediness. Sweet, high quality fruit. Loose skin peels effortlessly. Tree may bear alternately and often produces so heavily that limbs break. Bears Dec-Jan.
Fall Glo	Largest tangerine and has many seeds. Juicy commercial variety with sweet tangy flavor, peels easily. Susceptible to aphids and cold. Bears early, Oct-Nov.
King Mandarin	Large, orange-sized fruit with moderate seediness. Old time Florida mandarin with thick, rough, oily rind that peels easily. Fruit is sweet and moderately acidic. Late season variety that ripens April-June, may bear alternately.
Lee	Medium-sized fruit that varies in seediness. A mandarin that is easy to peel and excellent eaten out-of-hand. Lee is very juicy and has excellent sweet flavor with low acid content. The tree is cold hardy and densely foliated. Bears late Oct-Dec.
Murcott Honey	Small fruit that varies in seed content. Deep, orange, flesh has low acid and high sugar content. Murcott, also called the Honey-tangerine, is considered the sweetest tangerine. Very juicy with pleasant flavor, but not easily peeled. Bears alternately and later than most tangerines, Jan-Mar. Highly recommended.
Ortanique	Medium-sized tangor with few seeds. Flesh is very sweet and juicy with rich flavor. Difficult to peel. Tree is vigorous, large and a consistent producer. Bears late from Mar-June and stores well on the tree.
Page	Medium-sized bright orange-red fruit with few seeds. Richly colored flesh is sweet and excellent eaten out-of-hand or used in juice. Peels easily. Vigorous and productive bears Nov-Feb. An ECHO favorite, this variety is a cross between a Minneola tangelo and Clementine

## Fruiting Trees, Shrubs and Herbaceous Plants

	mandarin.
Ponkan	Medium to large fruit with few seeds. Ponkan has loose bumpy skin that peels in one piece. Low acid, sweet mandarin with excellent flavor. Bears alternately Dec-Jan. Highly recommended. Voted best mandarin by ECHO interns in the winter of 2002.
*Robinson	Small to medium fruit that varies in seed content. Sweet flesh has excellent flavor and rind is bright orange, thin, and peels with some difficulty. Branches are brittle and may break if heavy crops are not thinned. Very cold hardy and bears early Oct-Nov. Recommended pollinizers: Nova, Orlando, Temple or Sunburst.
*Sunburst	Medium-sized with variable seediness. Vibrant orange-red rind and flesh. Thin skin is not messy to peel, but is difficult to remove. Flavor is very good and sweet. A well-known commercial variety marketed as 'Christmas tangerine.' Small upright productive tree that bears Nov-Dec. Recommended pollinizers: Nova, Orlando or Temple.
Satsuma	Medium-sized, seedless, mandarin. Loose bumpy skin peels effortlessly. Flesh sections well and is mildly sweet and watery. Slow growing, extremely cold hardy tree bears very early, Sept-Nov.
Temple	Medium-sized tangor from Jamaica; varies in seediness. Highly colored, juicy flesh has rich, sweet (when fully mature), and spicy flavor. Excellent eating. Bumpy rind peels without making a juicy mess. Temple is an excellent pollinizer. The tree is somewhat thorny, sensitive to cold, and susceptible to aphids and scab. Bears Jan-Mar.

**Grapefruits**, *Citrus paradisi*, grow vigorously and can become large oak-sized trees. They can be excellent shade trees. Fruit can be harvested over an extended season because crop stores well on the tree. Once established, grapefruit trees are generally more cold hardy than other citrus. The following varieties are arranged in order of flesh color, lightest to darkest.

Duncan	Large fruit containing 50 or more seeds. The oldest cultivar in Florida, unsurpassed in flavor. Pale yellow flesh is juicy and sweet with a good sugar/acid balance. Duncan is a standard in quality for all grapefruits. Productive, cold hardy tree that bears Nov-March.
Marsh	Large seedless fruit with pale yellow flesh and rind. Very sweet, flavorful commercial juicing variety. Marsh bears Nov-March.
Thompson Pink	Large seedless fruit, with yellow peel and pink flesh that fades with age. Differs from Marsh only in flesh color. Sweet, flavorful, and bears Nov-March.
Ruby Red	Large seedless grapefruit. Rind is yellow with red blush. Pink flesh is sweet, juicy, and has fine flavor. Widely grown for juice and fruit cocktail. Also called 'Red Blush.' Bears Nov-May.
Ray Ruby	Medium-sized seedless fruit. Rind and flesh are darker and sweeter than Ruby Red. Ray Ruby has been rated the 1 <sup>st</sup> choice grapefruit among ECHO staff for several years in a row. Highly recommended. Bears Nov-May.
Flame Red	Medium-sized seedless grapefruit. Flesh is red, very sweet, and of excellent quality. Rind has pink hue, and fruit quality is most similar to Ray Ruby. Bears Nov-May.
Rio Red	Large seedless fruit that has yellow rind with red blush. The Flesh is deep red, juicy and has excellent sweet flavor. Bears Dec-April.

**Acid Citrus:** This includes the sour citrus, **lemons** (*Citrus limon*), **limes** (*C. aurantifolia*) and hybrids. Most varieties below would make good container trees.

Bearss	Large lemon with few seeds used for juice. Vigorous, thorny, and cold sensitive tree. Bears July-Dec.
--------	---

## Fruiting Trees, Shrubs and Herbaceous Plants

Key Lime	Small, seedy, lime that can be picked green or yellow when fully ripe. Pale green flesh has superb flavor. Used for juice and key lime pie. Extremely cold sensitive, small, thorny tree that performs well in a container. Everbearing. ECHO also carries ‘Thornless Key Lime’, which is less productive than the thorny variety.
Lem-n-Lime	Large fruit with few seeds. Fruit can be used while green as a lime or used as a lemon after fruit turns yellow. Very juicy and acidic. Most productive tree at ECHO that bears nearly year round. Due to Tristeza infection, we are unable to propagate for sale.
Meyer Lemon	Large lemon with few seeds, low acid content, and smooth-skin. Small, bushy, and cold hardy tree that performs well in a pot. Excellent for lemonade. Very productive year round.
Ponderosa	Very large novelty fruit over 3 inches wide. Lots of seeds. Dwarf tree produces year round. Juice is used for pies and drinks. Cold sensitive. Bears year round.
Persian Lime	Large, seedless lime with green rind and flesh. Juicy and acidic with outstanding flavor. Vigorous, productive and cold hardy. Grown commercially in Florida. Also called ‘Tahiti lime.’ Bears June-Sept. Highly recommended. Voted best of the lemons and limes by ECHO interns in winter 2002.
Red Lime	Small orange fruit with few seeds. Flesh is bright orange, very juicy, and not too tart. Good for cooking and drinks. Tree is dwarfed and cold hardy. Limes hold well on tree year round, but large crops are born in the fall and winter.
Variegated Pink Lemon	Medium-sized fruit. Both the leaves and fruit are variegated. Beautiful pink flowers and pink flesh. Fairly cold sensitive.

**Pummelo** (*Citrus maxima*, syn. *C. grandis*, *C. decumena*), the largest citrus in the world, is often mistaken for its descendent the grapefruit. Fruits are usually between 4.5 to 10 inches in diameter, and may be round or pear shaped. A thick, soft rind that can be as thick as 1.5 inches envelops the flesh, which ranges in hue from white to deep red. The distinctive rind of the pummelo increases the shelf life of this citrus for up to six months—that is longer than any other citrus fruit. Each segment contains hardy “juice sacs”, that easily separate from the segment wall—wedges maintain shape well and can be eaten out-of-hand or added to fruit salads. As a landscaping tree, the pummelo is a bushy, spreading evergreen with a weeping habit induced by the weight of large fruit. Vigorous growth requires management to prevent the boughs from becoming too leggy to support the fruit.

Hirado Buntan	Large pink-fleshed pummelo with many seeds. Fruit is round with thick yellow rind. Sections are very sweet and lack bitterness. Excellent flavor. Bears Nov- Mar.
Siamese Sweet	Large round fruit with few seeds. Superb sweet flavor, without bitterness. Flesh is pink. Bears Nov-March.
Goliath	Medium-sized, seedless, and pear-shaped. Thick yellow rind has pebbly texture. Pale yellow flesh is sweet with good flavor lacking acidity and bitterness. Bears Nov-Feb.

**Unusual Citrus:** Generally smaller trees that make excellent ornamental additions to a landscape. The kumquats and kumquat hybrids are small fruits with edible skin. These unusual fruits are excellent right off the tree, but most often used in canning and culinary arts. All grow well and fruit as containerized trees.

Calamondin	(X <i>Citrofortunella mitis</i> ) Small, round, orange-fleshed fruits often borne in clusters. Fruits are sour and excellent for marmalades and cooking. Vigorous, productive, upright tree, that is hardy to 10° F.
Buddha’s Hand	( <i>C. medica</i> var. <i>sarcodactylus</i> ) Large, oblong yellow citron with finger-like appendages extending from the base of the fruit. When the fruit is ripe, the ‘fingers’ uncurl. Peels are candied, added to potpourri or used as a room freshener. Tree has low-spreading shrub habit making it an unusual ornamental year round. Very cold sensitive.
Limequat	(X <i>Citrofortunella</i> spp.) Small, yellow, sour lime-shaped fruits with edible rind that can be used for juice or as a condiment. The tree is more cold hardy than a regular lime, but not as productive.

## Fruiting Trees, Shrubs and Herbaceous Plants

Keiffer Lime	( <i>Citrus hystrix</i> ) The Keiffer Lime (or Kaffir Lime or Lime Leaf) leaves are a very popular spice in Thailand; their characteristic flavor appears in nearly every Thai soup, stir-fry or curry. Keiffer lime leaves have a very strong, characteristic fragrance that cannot easily be substituted by other spices. The fruit juice, which is very sour and has the same fragrance as the leaves, is sometimes added to fish or poultry dishes in Malaysia or Thailand, however the tree is not typically grown for its fruit.
Meiwa Kumquat	( <i>Fortunella</i> sp.) Small tree producing 1-1½ inch, round fruit that is sweeter and more cold hardy than Nagami. Bears Nov-Mar.
Nagami Kumquat	( <i>Fortunella</i> sp.) Small 1-1½ inch elongated fruits that are less sweet, but have more juice and brighter color than Meiwa. An attractive tree that bears Nov-Mar.
Orangequat	Small round or teardrop-shaped fruit with few seeds. The sweet rind encloses tart juicy flesh. This small tree is very cold hardy and holds fruit well. Bears Nov- Mar.

### Seven varieties of citrus recommended for year round production of high quality fruits

#### Choice #1

Hamlin Orange  
Sunburst Tangerine  
Honeybell Tangelo  
Murcott Tangor  
Valencia Orange  
Persian Lime  
Grapefruit

#### Choice #2

Hamlin Orange  
Page Tangelo  
Ponkan Tangerine  
Murcott Tangor  
Valencia Orange  
Persian Lime  
Grapefruit

### We highly recommend the following citrus:

#### Tangerines

Sunburst\* (early)  
Ponkan (mid season)

#### Grapefruit

Ruby Red (dark pink)  
Thompson Pink (light pink)  
Ray Ruby (red)

#### Lime

Persian (commercial high quality)  
Key (traditional, small lime)

#### Lemon

Meyer (dwarf, productive)

#### Orange

Hamlin (early)  
Pineapple (mid season)  
Valencia (late)  
Navel (early eating)

#### Pummelo

Hirado Buntan

#### Tangelos

Page (early)  
Orlando\*  
Honeybell\*

#### Tangor

Murcott  
W. Murcott

**Table 3** Fruiting seasons in southwest Florida for citrus cultivars, arranged by citrus fruit categories, as described in the text on pages 12 to 15.

Citrus Type	Cultivar	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sweet Oranges	Ambersweet												
	Red Navel												
	Hamlin												
	Navel												

## Fruiting Trees, Shrubs and Herbaceous Plants

	Parson Brown												
	Pineapple												
	Blood												
	Red Valencia												
Tangelos	Orlando												
	Minneola												
Acid Citrus (Lemons & Limes)	Persian Lime												
	Key Lime												
	Meyer Lemon												
	Var. Pink Lemon												
	Ponderosa Lemon												
Unusual Citrus	Buddha's Hand												
	Orangequat												
	Kumquat												
	Calamondin												
Tangerines, Mandarins and hybrids	Fall Glo												
	Page												
	Clementine												
	Sunburst												
	Dancy												
	Ponkan												
	Murcott												
	Temple												
	Ortanique												
	King												
Pummelos & Grapefruit	Hirado Butan												
	Marsh												
	Ray Ruby												
	Rio Red												
	Ruby Red												
	Duncan												
	Thompson Pink												

### Cuban Mangosteen (*Rheedia aristata*)

#### *Rheedia aristata*

Cuban Mangosteen is an ornamental tree native to Brazil. The trees bear yellow, subacid fruits one inch in diameter that are used fresh or for jam. Because this tree bears very sharp-tipped leaves, it would work splendidly as a barrier to intruders in front of a window. The top half of our tree died back in the freeze of '97 when the temperature at ECHO was 24° F.

### Custard Apple (Bullock's Heart)

#### *Annona reticulata*

Initially we thought that this was more of a curiosity than a great tasting fruit, though it had borne until this year (2002) very few fruits. When we harvested some this April (2002) we could not believe the beautiful and great tasting fruit inside. The eye appeal and the taste were superb. Interestingly, it is ripe when few tropical fruits are in season and months after the sugar apples and atemoyas (other members of the *Annona* family) are finished. The fruit's flesh is snow white in the interior with ends that resemble, according to our director, "mashed raspberries stirred into ice cream." It may take several years for the tree to start producing good-quality fruit, but when it does, it will be worth the wait! This is the second tree in our *Annona* row in our arboretum behind the nursery trailer.

## Fruiting Trees, Shrubs and Herbaceous Plants

### Eggfruit

see *Canistel* on page 10.

### Fig

*Ficus carica*

**FCFS available.** The common fig is a small, deciduous tree or shrub that produces fruits without pollination. The tree should be planted in soil with compost worked in and then kept mulched to reduce nematode damage to the roots. Flooding is not tolerated, but a fairly large amount of water is beneficial until the fruit starts to ripen. Fruit is often produced the first year. Nematodes and leaf blight often greatly limit production in SW Florida. Severe winter pruning can reduce rust problems by invigorating the next season's growth. In the past, we sometimes had available a related, much more vigorous and nematode resistant fig to which we have grafted common figs. These can be especially productive, but should not be planted near septic tanks. A large, grafted, "Green Ischia" fig tree is located on the edge of the Herb Garden area

'Alma' originated in Texas and its nearly closed eye makes it a good selection for humid regions. The medium-sized fruit is greenish yellow with amber flesh. Very sweet, this cultivar may produce both a good spring and summer crop.

'Black Mission' produces large crops of medium to large fruits. The purplish black fruit and strawberry-colored flesh are of excellent quality and good for drying. May bear spring and summer crops.

'Brown Turkey' is a popular variety, producing moderate to large-sized fruit of bronze color. Though often rated as one of the best-flavored figs, an open eye makes this fig prone to souring in SW Florida's humid climate. Fruiting season begins with small spring crop followed by larger summer and/or fall crop.

'Celeste' is similar to 'Brown Turkey', but smaller and with a closed eye. Excellent flavored fruit that tends to fall when ripe. Tree bears one heavy crop a year, mid-July to mid-August.

'Green Ischia' bears medium-sized, tight-eyed figs camouflaged from birds by green skin color. The strawberry-colored flesh is delicious fresh or dried. The tree is small, often grown in containers, and produces late July to early August.

☼ 'King' yields large green figs with amber flesh of good quality. Used either fresh or dried, 'King' bears in summer.

'Magnolia' has similar flavor to 'Brown Turkey' but is a larger fruit. Fruit skin is a light burgundy-brown with an amber interior. They are found to be resistant to late summer rust. Fruit is prone to souring and splitting; to prevent this fruit should be picked before it is fully ripe. Not highly recommended.

### ☼ Flying Dragon

*Citrus trifoliata*, syn. *Poncirus Trifoliata*

Flying Dragon is a very cold hardy cross between the trifoliolate orange and sweet orange – it is one of the hardiest close relatives of citrus. The leaves drop during the winter months emphasizing the downward curving thorns even more. This striking ornamental grows 10-12 ft. and is useful in landscaping as a barrier to intruders. The fruit is of poor quality and not normally eaten.

### Governor's Plum

see *Madagascar Plum* on page 23.

### Graviola

see *Soursop* on page 31.

### Grumichama

*Eugenia brasiliensis*, syn. *E. dombeyi*

**FCFS available:** "Selected Eugenia Species". Grumichama is in the same genus as the Surinam cherry and has a slight hint of the Surinam cherry's resinous flavor. The flesh is soft, almost melting, and sweet with good flavor. The fruit is ½" to ¾" wide and contains fairly large seeds. Growth is compact and has been slow at ECHO. The plant eventually grows into a large shrub or small tree. If not for the fruit, at least for its attractive appearance, the grumichama is a nice addition to the yard with its large glossy, evergreen leaves that are reddish when young. Full sun is preferred and alkaline soils should be avoided. Although this is the least hardy of the common Eugenias, mature trees have tolerated 26° F without injury. Local nurseries recommend low nitrogen and high potassium fertilizer for good fruit production. One shrub is located between the Appropriate Technology shelter and the Propagation Greenhouse, another is in our

## Fruiting Trees, Shrubs and Herbaceous Plants

“Tropical Cherry” row to the south of the driveway entrance to the nursery, and another one is growing next to the library in the landscaped area between our office building and technical building.

### Guanábana

see *Soursop* on page 31.

### Guava

*Psidium guajava*

**FCFS available.** One of the most useful fruits, it can be eaten fresh, made into a refreshing drink, or processed in many other ways. The entire fruit can be used, the hard small seeds eaten right along with the pulp. There are jelly guavas, which contain enough natural pectin for making jelly, and sweet guavas. Depending on variety, flesh may be white, pink, yellow, or red. Guava fruits are highly nutritious. They are especially rich in vitamin C. Some varieties have five times the vitamin C as fresh orange juice. Guava trees tolerate fairly wet soils and some flooding. They can be frozen back by low temperatures of 25-28° F but usually re-sprout and may begin producing again in about a year. Fruit flies and white flies are common pests. Pruning trees will help them produce larger fruit and a heavier crop. We have a nice guava tree growing next to the fish pond in the landscaped area between our office building and library building.

‘Asian’ is a white guava, usually eaten immature when mildly sweet and crunchy.

‘Mexican White’ is a newer variety that has come highly recommended.

‘Old Time’ is the old variety of guava common in south west Florida. Fruits are small, yellow-skinned with pink flesh. Trees are highly productive and do well in our local area.

✿ ‘Peruvian White’ is a round rather than pear-shaped guava. It has a texture similar to a pear, but with the mild guava flavor. The skin is yellow and the flesh is white and contains few seeds.

✿ ‘Redland’, when fully ripe, looks like a small ‘Bartlett’ pear. It has yellow skin, pink flesh and a good number of seeds. Redland is a guava lover's guava that is high in pectin and excellent for making jellies.

‘Ruby X Supreme’ is the preferred guava of ECHO’s director, Martin Price. This highly productive cultivar produces pear-shaped, yellow skinned guavas with thick, pink flesh. Lower in pectin than other varieties, this variety is superior for eating out-of-hand or processing into juice.

✿ ‘Thai Guava’ is apparently a guava from Thailand that bears large pear-shaped white-fleshed fruits. Recently planted at ECHO, its quality is still unknown.

### Hog Plum

see *Red Mombin* on page 26.

### Ice Cream Bean

*Inga edulis*, *I. vera*, *I. spectabilis*, etc...

Ice cream bean is a fast growing leguminous tree species of the tropics where it is often grown to shade coffee and cacao. The pods are quite large, 1-1½ in. wide and 9 or more in. long. The fibrous pulp around the seeds looks like vanilla ice cream or white cotton candy and is mildly sweet. The seeds are large and are not eaten. Some light frost is usually tolerated, but it is very freeze sensitive. Ice cream bean is not a particularly heavy bearer in Florida and requires cross-pollination.

Several *Inga spectabilis* seedlings are planted in the Rainforest Clearing garden of our Global Village. They were collected in the Congo and come from pods over 2’ long containing snow-white flesh with superb flavor. We will be propagating this variety for sale in our nursery when the seedlings begin production.

### ✿ Illama

*Annona diversifolia*

Illama is perhaps the finest of the Annonas with extraordinary flavor unique to this cultivar. David Fairchild described this fruit as “very juicy, delightfully sweet, with a refreshing flavor unlike any Annonaceae I ever tasted.” This delectable fruit is native to the tropical lowlands of Mexico and Guatemala where it is called, “the old woman’s sapote.” The illama fruit is softball-sized with the characteristic protuberances associated with the Annona family. The thick rind is coated with downy gray fuzz. Green-skinned varieties generally have white, very sweet flesh; while pink varieties have shell colored flesh that is somewhat tart. Flesh is sweet and somewhat fibrous but custard-like toward the middle. Fruit is ripe when it cracks open on the tree; however, they can be picked up to 3 days early and allowed to soften. The

## Fruiting Trees, Shrubs and Herbaceous Plants

fruit will not ripen off the tree. The leaves of this deciduous tree emerge red and pubescent. Tree height does not surpass 25 ft. The flowers are maroon. A seedling bears in 3-5 years, however ECHO sells named varieties that are grafted onto wild pond apple, *Annona glabra*, or custard apple, *A. reticulata*. Bears Aug-Sept.

### ☼Imbe

*Garcinia livingstoneii*

Imbe is a small ornamental mangosteen relative that can grow to 9 ft. Female trees produce an orange-yellow fruit if a male tree is near. The fruit pulp is thin and juicy with a pleasant tangy flavor and one or two large seeds. The rind and seed are not edible. It is mainly used as an ornamental and grows well in most soil types. The tree is fairly drought tolerant, but has been killed back by freezes at ECHO. You can see an Imbe growing in the “Edible Landscaped” area between our office building and library.

### Indian Jujube

*Ziziphus mauritiana*, syn *Z. jujuba*

**FCFS available.** This is the large spreading tree at ECHO’s farm entrance. Our trees have received little frost damage and produced fruit following the freeze of January 1997. Jujube does well even in poor soil and is drought, flood and wind tolerant. It blooms for several months, attracting innumerable bees and beneficial insects, and then fruits heavily. The fruit has a sweet, firm, crisp flesh, somewhat like an apple, and contains one hard pit. The immature fruit resembles a small green apple and is sometimes eaten with salt. The mature fruit is brown and softer and mealy, slightly resembling a baked apple in taste. They are usually eaten fresh, made into a cold drink, dried or cooked. Most varieties are self-fertile and start producing in about two years. An Indian Jujube is the large tree providing shade to the entrance to our shop building on the south side of the nursery parking lot.

‘Giant Thai’ Nearly thornless, large leaved variety. Produces large, near-apple sized fruits when mature. Grafted trees of this variety produce quickly.

### Jaboticaba

*Myrciaria cauliflora*, syn. *Plinia cauliflora*, *Eugenia cauliflora*

**FCFS available.** This unusual small tree produces its blooms and fruit right on the trunk and main branches. The fruit is much like a large, dark purple, very sweet, slipskin grape. The flavor is very good and the fruits are eaten fresh or processed into jam or wine. The skin is tough so when eating the fresh fruit it is best to squeeze the pulp out into the mouth and discard the skin and seed. Tree growth is slow and production starts in 8 to 10 years from seed. Girdling about 1/4” of the bark off one of the limbs of a tree which is at least 3 or 4 years old may induce fruiting. The bark has good ability to grow back together. Cool nights are required to initiate flowering. The plant is self-fertile. The time from bloom to ripe fruit is only four or five weeks. Several crops are produced late fall through spring at ECHO. Jaboticaba trees seldom exceed 15 feet in height, can tolerate flooding and do best in a fairly fertile, well-irrigated, slightly acid soil. Large jaboticaba trees are planted in the Tropical Highlands area of the Global Village and near the nursery parking area. They have evidenced little cold damage.

### Jackfruit

*Artocarpus heterophyllus*

**FCFS available.** Standing roughly 40 feet tall at maturity, jackfruit produces a fruit weighing from 10 to 60+ pounds from the trunk or large branches. The fruit becomes aromatic and softens when ripe. The flesh is popular eaten out-of-hand, and contains many seeds which are boiled or roasted like chestnuts. The flesh can also be blended into a shake or made into jam. Mature but unripe fruit can be sliced and cooked. The fruit contains latex so it is a good idea before cutting the fruit to coat the knife and your hands with cooking oil. The tree is evergreen and attractive in appearance. Production can start in about three years with grafted trees or three to fourteen years from seed. Cross-pollination is helpful but not necessary. The tree does not tolerate waterlogged soil and is about as freeze tolerant as a mango. We have several jackfruit trees on our property. The oldest one is in the landscaped area between the office building and the technical building. This tree produced 13 fruits in 2001, most over 10 lbs each. There are younger trees growing near the rainforest clearing area and to your right as you enter the nursery parking area.

☼ ‘Black Gold’ is another highly recommended variety that we sometimes have available as grafted trees.

☼ ‘Mai 1’ is a seedling tree of Vietnamese origin from the nursery of Richard Wilson in West Palm Beach. This highly recommended cultivar bears at a young age and the fruit is of exceptional quality.

‘NS-1’ is a selected variety from seed that will bear in 3-4 years. This highly productive cultivar bears delicious fruit that is sweet and crisp.

## Fruiting Trees, Shrubs and Herbaceous Plants

### Jamaica Cherry

see *Strawberry Tree* on page 31.

### Java Apple

see *Wax Jambu* on page 32.

### Jelly Palm

*Butia capitata*

This is an attractive palm with bluish foliage that produces racemes of yellow fruit with pink blush. The fruits are about 1½" wide, juicy, and fibrous with a sweet/tart flavor. They make a very good jelly and wine and have a peach aroma while cooking. To make jam, just remove the flesh from the seeds, cook with an equal amount of sugar, and then liquefy in a blender. The tree is hardy to southern Georgia, is drought tolerant, and usually bears at least two crops of fruit a year. There is a Jelly Palm tree growing on Mount Victor, and another one next to our shop building.

### Jocote

see *Red Mombin* on page 26.

### ☼Kei Apple

*Dovyalis caffra*, syn. *Aberia caffra*

The Kei Apple bears a bright yellow, round, 1-2 inch fruit. It has an apricot texture and is highly acid. They make an excellent drink or can be cut in half, sprinkled with sugar and then eaten after a few hours. They can be made into jam, jelly, or shortcake. Production starts in 4 to 5 years; sooner with cuttings. The fruiting season is August to October. Seedlings can be male or female though male trees are not always needed for good fruit production. The plant is a shrub or small tree and some have 1 to 3 inch spines. Kei apple performs well in most soils that do not have a high water table. This shrub can be found growing as far north as Gainesville; however, temperatures below 20° F may kill it.

### ☼Limeberry

*Triphasia trifoliata*

Limeberry is a small, thorny, ornamental bush related to citrus. It produces white flowers and ½ inch wide dull red fruits, which are usually not eaten but do have a unique bitter citrus flavor. Limeberry grows well in shady conditions.

### Lime leaf

see *Keiffer Lime* on page Error! Bookmark not defined..

### Longan

*Dimocarpus (Euphoria) longan*

**FCFS available.** Longan is similar to the lychee but has a different flavor and ripens later, usually between July and August. Longans are also more vigorous, cold hardy, and wind tolerant than their close relative, the lychee. The tree is an attractive, symmetrical evergreen that bears clusters of golden round fruits. The leathery skin, when peeled, reveals a delectable, translucent, jelly-like fruit encasing a dark round seed. The fruit is enjoyed fresh, canned, or dried. Longan trees grow vigorously to about 35 ft. tall and spread to 45 ft. wide. Fruit production usually starts 2-3 years after planting, but it may be erratic if proper management is neglected. Post-harvest pruning, at least 6 inches below the fruit panicle, can promote better fruiting the following season. Both the longan and lychee seem to need a rest period to fruit well the following season. Withhold water and fertilizer in the fall to encourage "dormancy" (not a true dormancy) throughout the winter months. See the notes under "Lychee" on page 22 for further explanation. Resume care after the threat of freeze has passed. Mature trees can tolerate 25-26° F with small branch damage. Small trees can have stem damage at 28° F. A longan is an excellent choice for a containerized fruit tree, as it will bear heavily in a pot. We have several longans growing in our arboretum.

ECHO normally stocks 'Kohala' and sometimes has 'Chompoo', 'Doggelman', and 'Bai Dum' – a dwarf variety from Hawaii.

'Biew Kiew' is a Thai variety that fruits later than Kohala.

'Diamond River' is an Australian selection that produces medium sized fruit of excellent flavor. This late season cultivar produces fruit in September.

'Kohala' is a Hawaiian variety that produces good quality, large, sweet fruit and bears consistently heavy crops. The fruit matures early, usually in July. This is the primary cultivar recommended for home and commercial planting.

## Fruiting Trees, Shrubs and Herbaceous Plants

‘Pepperseed White’ is a newly available variety. This variety is reputed to be of very high quality but with a small seed.

### Loquat

*Eriobotrya japonica*

**FCFS available.** Loquats are well appreciated at ECHO. In fact, we have planted about a dozen trees (which can be seen planted behind the nursery trailer and on either side of the “A-frame” building). This subtropical fruit is a member of the Roseaceae family along with apples, pears, and peaches. Originating in Asia, loquat is now gaining popularity in North America. Most people usually like the fruit the first time they try it. A tree grown from seed may take 4-6 years to bear fruit. Seedling fruits vary from sweet to sour. Grafted trees produce more quickly and have sweeter fruit. Loquats bear clusters of small round to pear-shaped fruits. The fruit has a fuzzy peel that can be eaten or removed. The fruit also makes a good jam. Fruit flies can attack the fruit and cause it to rot. Trees are usually self-fruitful and highly productive. Fruit ripens February to April. Cold is no problem here in south Florida since it doesn't even lose its leaves after a freeze. There is little difference among the following cultivars.

‘Bradenton’ is a vigorous tree that bears large, 2 inch long, excellent flavored fruits. Fruit ripens late, in April.

‘Jehuda’ came highly recommended by another nurseryman, but we have not had any experience with this variety.

✿ ‘Christmas’ is an early season variety.

✿ ‘Premier’ is a slow-growing loquat with fruit that is sweet and of excellent quality. Fruit size is approximately 1 inch in diameter and 1¼ inch in length.

✿ ‘SES #2’ is a variety developed by the University of Florida Experiment Station and was never officially released. Dr. Martin Price, ECHO’s executive director, found this variety to be the best tasting one among the varieties in his personal collection. It has a large, yellow, sweet fruit.

✿ ‘Sherry’ is another yellow-skinned, sweet cultivar.

✿ ‘Wolfe’ is a productive cultivar selected by University of Florida. The fruit is slightly pear-shaped with fairly thick skin. The flesh is firm and sweet when tree ripened.

✿ ‘Gold Nugget’ produces large, firm, juicy fruit with sweet, apricot-like flavor. Bears fruit late in season.

Other varieties that ECHO sometimes carries are ‘Oliver’ and ‘Fletcher’.

### Lychee

*Litchi chinensis*

**FCFS available.** Lychee is a delicious fruit with a limited range of adaptation. It only fruits in a few subtropical places in the world and southern Florida is one of these locales. Lychees are graceful and handsome evergreens with dense foliage and a rounded top. Flushes of new growth are beautiful, colored pink or red, but susceptible to wind damage. They are slow growing and if left unmanaged can become oak-sized trees. The fruit has a leathery pericarp that is easily peeled. The pulp is white and translucent with an excellent subacid flavor. It can be eaten fresh, dried, frozen, canned, or smoked, but it will not ripen off the tree. Lychee is self-fruitful and production starts in 3 to 5 years.

ECHO sells air-layered trees that are capable of producing fruit one year after propagation. Lychees have a high water requirement, but cannot stand waterlogging. In good years, they are extremely heavy producers and will require extra irrigation to increase fruit size. Lychee also has a reputation for “off years”, in which little or no fruiting occurs. Lychees are dependent first of all on cold weather to induce flowering. As well, they should not have a vegetative flush after October 1. The age of the last vegetative flush is another critical factor combined with cold weather. One can reduce the likelihood of a fall leaf flush by eliminating any nitrogen-based fertilizer applications after July 31, resuming again around the start of February. Another way to prevent a fall leaf flush is to lightly prune trees (to about 6 inches below the fruit panicle) around the beginning of August to encourage or force a leaf flush before October 1. All efforts can still be for naught if we have an exceptionally mild winter. Resume care when blooming does occur, or earlier if tree show signs of stress. Lychees bear fruit during June and July. We have nine lychee cultivars in the arboretum and on Mount Victor.

‘Brewster’ is a hardy commercial variety that can bear consistently and heavily if trees are managed properly. The fruit is good tasting, has a beautiful red pericarp, an average-sized seed, and is more acidic than ‘Mauritius’.

‘Emperor’ is a regal tree with beautiful flushes of pink growth. The fruit is bright red, very large, up to 2 oz each, and delicious.

## Fruiting Trees, Shrubs and Herbaceous Plants

\*‘Groff’ is a seedling of ‘Hak ip,’ selected in Hawaii from an experiment with 500 lychee seedlings. Though fruit size is small, most fruits have tiny, undeveloped seeds. The excellent-flavored flesh is of high quality. The tree is small, bears consistently, and is a good companion tree because it is a late season cultivar.

‘Hak ip’ or ‘Black leaf’ is one of the top three lychees of China. This mid-season variety bears sweet, crisp fruit that have small seeds and high flesh content. Fruit pericarp is medium red when ripe, but the fruit can be eaten while the skin is green-red. The tree has slender dark green pointed leaves.

\*‘Kaimana’ fruits are twice as large as ‘Mauritius,’ heart-shaped, and of excellent quality. It is a regular bearer where it is native, but has not yet been proven in Florida. Therefore it is recommended for the collector only.

‘Mauritius’ is a consistent heavy producer of commercial quality fruit. The fruit is heart-shaped with rough red pericarp; the flesh is sweet and aromatic. The tree has an irregular spreading habit that gives the tree a gangly look.

‘No Mai Chee’ is considered to be one of the finest tasting of all of the lychees. Crispy, sweet fruit and a very small seed make this lychee highly desirable. However, this variety does tend toward irregular production, fruits are small and shell color varies between yellow and red.

\*‘Ohia’ hails from the mountain regions of northern Thailand and is slightly more cold hardy than the other varieties. Ohia variety trees bear consistent crops of small-seeded fruit of excellent quality and sweet flavor.

‘Sweet Cliff’ has small leaves and is an attractive tree. ‘Sweet Cliff’ is an early season lychee. The trees are attractive, possess small leaves, and bear consistent, heavy crops of fruit in SW Florida. The salmon-colored pericarp encases deliciously sweet flesh and an average-sized seed. The fruit size increases as the tree becomes larger. ‘Sweet Cliff’ has proven to fruit the most consistently of the varieties we have on our farm.

‘Sweetheart’ is a consistent producer of very large, heart shaped fruit with small, ‘chicken tongue’ seeds. Production is close to that of Mauritius, a popular commercial variety. This is a good choice for door-yard production because of its reliability and high quality.

## Macadamia

### *Macadamia tetraphylla*

Macadamia is a moderately hardy tree for south Florida and produces a very high quality nut in one to five years. ECHO sells air-layered trees that are capable of producing nuts one year after propagation. The tree does not require high soil fertility, but will probably need granular or foliar micronutrient sprays of zinc, iron, and manganese (take care not to over fertilize). Good soil drainage is also required. Mature trees can withstand 25-26°F for short periods with minor damage to the foliage. Young trees and foliage are very tender and are killed very near freezing. Temperatures of 27° F and lower damages flowers and young fruit, reducing production. Nuts can be cracked open using a PVC cutter or after roasting. To roast, simply place nuts, shells included, on a cookie sheet in the oven at 300° F for 15 minutes. Turn oven off and let nuts cool inside on tray. Kernels will shrink some and shell will become brittle and easy to crack. A few mature macadamia trees are located in the arboretum.

‘Dana White’ is the most prolific bearer in Florida. It was developed in Homestead. When blooming, the tree is nearly white with blossoms. It may be one of the more cold hardy varieties for Florida use. The nut tastes the same as the Arkin variety but is contained in a very hard shell.

\*‘Beaumont’, a well-known recommended dooryard variety, has spiny leaves, attractive red young growth, and pink blossoms. The tree produces favorably and holds nuts on the tree well. Although Beaumont trees may bear alternately, the harvest period can last over 6 months.

‘Arkin Papershell’ bears almost as well as ‘Dana White’, but its claim to fame is that each nut has a blemish or small crack somewhere on the shell, and if properly struck with a hammer, the shell will crack open readily.

\*‘Kauai’ is a commercial variety from Hawaii that bears slightly larger fruit. The tree is upright in habit and productive.

## Madagascar Plum (Governor's Plum)

### *Flacourtia indica*

Madagascar or Governor’s Plum is a bush or small tree, easy to grow, and native to southern Asia. The tree can be male or female. The fruits are about one inch wide and can be eaten fresh or made into preserves. They are sweet, with a texture and flavor similar to a plum, but quality varies and they are often astringent and slightly bitter. They seem to be self-fertile. The plant is fairly hardy in southern Florida. Our current selection comes from a good-tasting selection in the Congo, Central Africa.

## Fruiting Trees, Shrubs and Herbaceous Plants

### Malabar Chestnut

*Pachira aquatica*, syn. *Bombax glabra*

This is a small 15 ft. tree that is grown in many parts of the world for its delicious seeds, eaten raw or roasted. The roasted seeds taste like chestnuts or cashews, but take time to peel. This evergreen tree produces fairly large, white, self-fertile flowers several times a year followed by 4-12" capsules that burst open when the ½" or larger seeds are mature. Production starts within a few years. Malabar Chestnut is very frost sensitive, but resilient. A tree produced the second winter after a hard freeze killed it back to the ground. You can see a mature Malabar chestnut tree to the left as you pull into the nursery parking lot.

### Mango

*Mangifera indica*

**FCFS available.** This tasty and nutritious fruit is becoming increasingly popular in the United States. It grows in the tropics and warm subtropics. It will grow in poor soils and does not need a lot of water. Good production starts in 3 to 4 years with grafted trees. Wet or cool weather during bloom in the spring limits fruit set. Temperatures of 40° F will damage mango blossoms. Mature trees may tolerate 25° F for a few hours with leaf and small branch damage, but young trees may be killed at 29-30° F. Trees in the tropics become large and stately like oaks. Warning: Some people react to the skin of mango fruit like they do to poison ivy. Most of these varieties, as well as many others, are growing somewhere on our property.

‘Alphonso’, one of the most popular varieties in India, is a very large variety, often with a red hue on its skin. It has a distinctive luscious taste, and leaves a lingering flavor on the palate. It is valued for its overtones of rose, pineapple and nectarine flavors.

‘Bailey’s Marvel’ was discovered on Pine Island, and is one of the most cold tolerant mangoes. The fruit is medium-sized, oval-shaped, yellow and reddish. The yellow flesh is juicy, sweet, fibreless, and has superb flavor. The fruit will not ripen if picked before the skin develops a reddish blush. It is a productive tree that bears July-mid August.

‘Beverly’ is a yellow skinned mango with yellow flesh. The fruit is of excellent quality and it has a sweet, smooth and rich mango flavor. Flesh is juicy, melting, and virtually fibreless. Beverly is a low spreading tree that is a good producer. It is a late mango bearing into September.

✿ ‘Carabao’ is the main export mango of the Philippines. The long, greenish-yellow, nearly fibreless fruit has an excellent mild flavor. Season June-July. This cultivar is reported to be a poor producer in Florida.

‘Carrie’ is a mango lover's dream with deep, orange, fibreless, highly aromatic flesh. It is extremely tender, juicy, and has excellent sweet and tangy flavor. The fruit is of small size with a thin skin that is green to yellow when ripe. Carrie is an excellent dooryard variety that consistently produces and is moderately resistant to anthracnose. Season June-July.

‘Cogshall’ This dwarf mango is an ultra compact grower suitable for small yards or container growing. This variety produces sweet, fibreless fruit. It can easily be maintained at eight feet tall, while still consistently producing a good size crop. Fruit ripens from June to July.

‘Cushman’ is an excellent mid to late season mango that reportedly resembles a grapefruit in size, shape, and color. The flesh is smooth, creamy, and fibreless. Trees have poor disease resistance and will require fungicide treatments to keep the tree looking good. Fruit ripens July to August.

‘Dot,’ a seedling of ‘Carrie’, has such a rich, full-bodied mango flavor that even mango lovers can eat only a few at a time. The fruit is medium-sized and has an exceptionally strong aroma. The skin is yellow with pink blush and easily separates from the flesh. The sweet flesh is deep yellow, juicy and has little fiber that makes the fruit somewhat firm. The fruits are susceptible to anthracnose. Dot has a long season, bearing June-August and is an excellent dooryard choice.

‘Duncan’ is a mid to late season fruit bearing July to August. Fruits are yellow and weigh ¾ to 1 ½ lbs. This fibreless fruit is rated by Fairchild gardens as having good to excellent flavor and has a unique, sugary melon-like flavor.

‘Edward’ resulted from a cross of ‘Haden’ with ‘Carabao’. Skin color varies from yellow to pink. The flesh is deep yellow to orange, sweet, savory, and fibreless. It is one of the best-flavored mangoes but production is usually low in Florida. Season June-July.

‘Fairchild’ is a fiberless Panamanian selection of excellent eating quality. The flesh is firm, juicy, and aromatic. The fruit itself is small and pale yellow, but the tree has attributes that make up for the less than stellar appearance. With very little effort the tree can be maintained at a height of ten feet and grown in a container. The fruit ripens June to July.

## Fruiting Trees, Shrubs and Herbaceous Plants

‘Glenn’, a seedling of ‘Haden’, bears medium-sized yellow fruits with orange-red blush. The tender, juicy flesh is deep yellow and has little fiber. The flavor is rich, tangy, and of excellent quality. The season is June - July, 7-10 days earlier than ‘Haden’. Glenn has moderate resistance to anthracnose and is highly recommended as a dooryard variety.

‘Haden’ produces one of the most attractive red-colored fruits. The flavor is very good and the flesh is firm, containing some fiber. It is susceptible to disease and tends to bear irregularly. The tree is vigorous and large. Bears June-mid July.

‘Irwin’ is a fiberless Florida cultivar known for its consistent and heavy production. The flesh is sweet, melting, aromatic and of good eating quality. The skin is a showy deep crimson red. The tree is a moderately vigorous grower attaining heights of 15-20 feet adorned with fruit that often hang in clusters. Fruit ripen from June to early July.

‘Julie’ is a slow-growing, dwarf mango especially popular in Jamaica. A mature tree grows 18 ft. tall and is very productive. It bears small red to yellow fruit with low fiber content and unique flavor. Good container tree. Julie trees are resistant to disease and fruit flies. Season July-Aug.

‘Keitt’ is a greenish-yellow mango with crimson blush. The flesh is yellow, firm, juicy, and contains a little fiber. The flavor is sweet and mild. The fruit can weigh between ¾ to 4 lbs. The tree's open growth habit makes it more susceptible to cold injury. Keitt is moderately resistant to anthracnose and consistently produces heavy crops. This leading, late season commercial variety bears fruit August through early October.

‘Kent’ mangoes have greenish-yellow skin with dark red blush and weigh over a pound. The flesh is somewhat firm, fibreless, and esteemed by many as one of Florida’s finest mangoes. The trees are productive and exhibit more cold or freeze tolerance than other varieties. Kent trees bear July through August.

‘Mallika’ is among the finest of Indian desert mangos. Fairchild Tropical Gardens describes the fruit as canary yellow, with an average weight of about 1 lb, with a fibreless, firm, deep orange flesh and a rich, highly aromatic and complex flavor. They recommend harvesting fruits before they ripen on the tree and storing them at room temperature for 2 to 3 weeks in order to achieve the intensely sweet, honey-like flavor. The tree is compact and moderately vigorous. Season: July-August.

‘Nam Doc Mai’ is esteemed by Asian cultures as a pickled fruit, or as one eaten green or ripe. This Thai mango is elongated and tapers to a point. The skin is green-gold to bright yellow when ripe and easy to peel. The flesh is tender, juicy, and fibreless. It has rich sweet flavor, contains little acid, and is of excellent eating quality. Nam Doc Mai will produce consistently even if kept as a small tree and may bear multiple crops throughout June and July.

✿ ‘Okrung’ is a green-skinned Thai mango variety that is eaten firm and unripe and after it has ripened. The flesh is soft, juicy, very sweet with low acid, and abundant fiber. Okrung is highly productive and has a long season: June-August.

‘Palmer’ is a medium to large tree with large fruit, 20-30 ounces. Fruit is orange/yellow with a red blush and fibreless. Produces July to August and sometimes into September.

✿ ‘Pim San Mun’ is esteemed as one of the finest green mangoes of Thailand. Unripe fruits are crisp, fibreless, and refreshingly delicious with flavor similar to a green apple. Ripened fruits are yellow and have good flavor. If the weather conditions permit, this cultivar will bear multiple crops throughout the summer beginning in early June.

‘Southern Blush’ is similar to ‘Tommy Atkins’ with less fiber and better flavor. It is also an early season variety.

‘Tommy Atkins,’ one of Florida’s important commercial varieties, is a consistent, heavy bearer with good resistance to anthracnose. The medium-sized fruit is attractive with orange-yellow skin and red blush. The flesh is firm, yellow, juicy, and contains some fiber, contributing to a longer shelf life. Fruit quality is known to decrease when trees are over-fertilized and irrigated. Bears June-July.

‘Valencia Pride’ is one of the faster growing mangoes; its growth form may become ‘leggy’. The fruit is long, tapered, and yellow with crimson blush. The flesh is yellow-pink, juicy, contains little fiber, and has excellent, tangy, mango flavor. Valencia Pride is a consistent producer and recommended dooryard variety. Bears July-August.

### \*Manager’s Choice

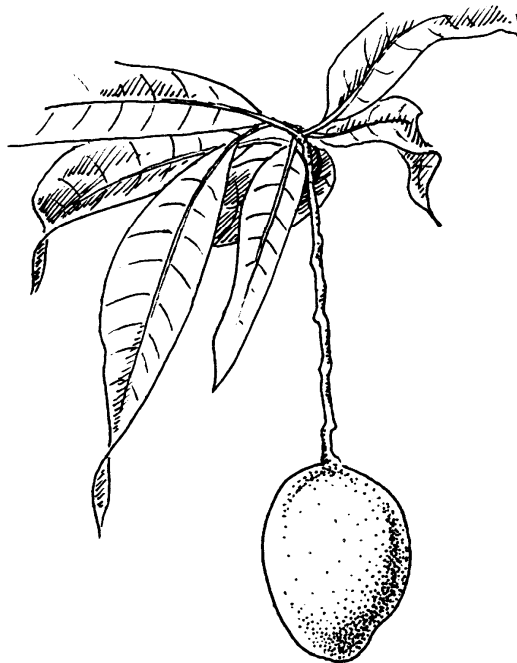
Early season: Glenn  
Mid-season: Malika

## Fruiting Trees, Shrubs and Herbaceous Plants

Late season: Valencia Pride

**Table 4** Fruiting seasons in southwest Florida for mango varieties, as described in the text on pages 24.

Cultivar	Jun	Jul	Aug	Sep	Oct
Alphonso					
Bailey's Marvel					
Beverly					
Carabao					
Carrie					
Cogshall					
Cushman					
Dot					
Duncan					
Edward					
Fairchild					
Glenn					
Haden					
Irwin					
Julie					
Keitt					
Kent					
Mallika					
Nam Doc Mai					
Okrun					
Palmer					
Pim San Mun					
Southern Blush					
Tommy Atkins					
Valencia Pride					



### Miracle Fruit

*Synsepalum dulcificum*

**FCFS available.** This shrub is native to West Africa and fruits when only 1 or 2 feet tall. At maturity it will reach seven feet. Miracle fruit produces small red fruits several times each year. The “miracle” is that if lemon or other sour fruit is eaten after the miracle fruit, the sour fruit tastes sweet. A natural chemical in the fruit masks the tongue’s sour taste buds so that lemons taste like lemonade or lemon pie! The sweet sensation lasts from 20 minutes to 2 hours. **Miracle fruit must have acid soil**, is frost sensitive, and requires partial shade. It is an excellent choice for a containerized tree, which gives it the added benefit of mobility. Fill a container with a 50:50 mix of peat moss and perlite; this combination will create an acidic environment with good drainage. See some of these plants growing in the rainforest clearing, or next to the steps going into our library.

### Mombin, Red (Ciruela, Hog Plum, Jocote)

*Spondias purpurea*

**FCFS available.** This heavy producing tree has become a favorite at ECHO. The pleasant smell of the fruit can be noted many feet away. The 1- to 2 inch long oval or oblong fruits have a fairly large seed. The skin is waxy and thin and the juicy flesh is aromatic with a plum-like flavor that is acid to subacid. The fruit can be eaten fresh or stewed with sugar as a dessert or can be used to make a very good jam. Mombin butter, using an apple butter recipe, is exceptionally tasty. The tree is deciduous, fast growing, and may produce fruit before leafing out in the spring. The young leaves can be eaten cooked but they have a sour flavor. The tree grows well in a wide variety of soils. They can be propagated easily by putting large cuttings in the ground and they make a good living fence. ECHO’s tree produced several dozen fruits the second summer after it froze almost to the ground from the freeze of ‘89. It bears May through June.

## Fruiting Trees, Shrubs and Herbaceous Plants

### Mulberry

*Morus rubra*

Mulberry grows vigorously and fruits spring through early summer here in southwest Florida. Severe summer pruning encourages fruiting in the summer and fall and renews vigor. Caterpillars sometimes attack the leaves, but there is no concern about freeze damage to this tree. The Mulberry is a hardy, deciduous tree that tolerates both flooding and drought. The multiple fruit resembles a long slender blackberry; they make excellent jams and are relished by birds. We have a 'Tice' Mulberry tree growing near the duckpond.

'Tice' fruit is large and sweet with good flavor and large leaves.

'Everbearing' is variety of mulberry is known as one of the longest ripening varieties with fruit ripening over several weeks, therefore the name everbearing. Sweet, delicious fruit is black, nearly seedless and up to 1 1/2" long.

'White' most cold-hardy of the mulberry varieties. Named for the color of its buds, and bears earlier in the Spring.

### Naseberry

see *Sapodilla* on page 30.

### Natal Plum

see *Carissa* on page 11.

### Neem

*Azadirachta indica*

**Technical Sheet Available.** Neem is a fairly fast growing tree and is medium in size when mature. The seeds, and to a lesser extent the leaves, contain azadirachtin. This is a systemic pesticide with both repellent and insecticidal properties. It has little if any toxicity to mammals and wasps (beneficial insects). Seed production starts in five years or less. Two trees of different genetic origin are needed for cross-pollination (i.e. two seedling trees). Sometimes we have grafted neem so the rootstock and grafted branch can pollinate each other. Be sure you do not prune the grafted branch! The seeds can be ground up and soaked overnight, then strained and the liquid mixed with more water and sprayed on gardens. Many commercial neem insecticide products are now on the market. The wood is similar to Cuban mahogany and is tougher than teak. It is rot and insect resistant. Neem will grow under very dry conditions once established and also tolerates heavy rainfall, but needs good drainage. It can be killed by waterlogged soils. Neem is freeze sensitive and at least the lower trunk should be protected if there will be freezing temperatures so it can grow back from the trunk. Re-growth does not begin until about mid-spring since neem does not normally produce new growth in the winter.

### Nesberry

see *Sapodilla* on page 30.

### Nispero

see *Sapodilla* on page 30.

### Otaheite Gooseberry

*Phyllanthus acidus*, syns. *P. distichus*, *Cicca acida*, *C. disticha*

Otaheite gooseberry is a very prolific shrub or small tree known as Mayom in Thailand. The tart yellow fruits are produced abundantly in January and in smaller quantities at other times. The fruits resemble a flattened Surinam cherry, but are yellow. They can be sliced from the pit and covered with sugar for a day in a refrigerator, then used as a sauce. It can be cooked with sugar and will amazingly turn into a ruby-red jam. They also can be combined with other fruits to help the jelly/jam "set." The young leaves can be cooked as a vegetable. The tree grows well on most soil types, thriving even on quite alkaline soil, but likes moisture. Good cropping starts in four years from seed. Sweet varieties are now available.

### Papaya

*Carica papaya*

**FCFS available.** Papaya is one of the favorite and by far the most productive fruits at ECHO. It is an attractive plant and can be ten feet tall and loaded with fruit in less than one year. The ripe fruits can be eaten fresh and have about the same concentration of vitamin C as oranges. They are also a good source of Vitamin A and can be made into juice, jam, dehydrated fruit, or are canned in syrup. Unripe fruits are peeled and cooked as a substitute for summer squash or applesauce. "Solo" varieties produce 1.1-2.2



## Fruiting Trees, Shrubs and Herbaceous Plants

lbs. fruits that are often favored for their taste and size over the regular large fruited varieties. Another advantage to solo papayas is that about  $\frac{2}{3}$  of the plants are self-fertile and the rest are female so there are no unproductive male plants. Papayas perform better on fertile soil and do not tolerate flooding. The leaves are frost sensitive and the trunk can be killed back by a freeze, but the plant usually grows back. The tree can live about 20 years under good conditions, but they are usually replaced after a few years due to decline in production. We recommend planting at least 2-3 papayas to ensure that male and female flowers are present. Fruits from female plants are usually short and round with a large seed cavity, while bisexual plants bear elongated fruits with thicker flesh and a smaller seed cavity. We have many papaya plants growing all over the farm.

‘Known-You No. 1’ is a yellow-fleshed Taiwanese hybrid that has very large fruits weighing up to 7 lbs. The plant is sturdy, productive and tolerant of papaya ring spot virus. The elongated fruit has sweet and good flavor. From our experience, this cultivar produces only female or bisexual plants. We have also found that on this variety even the female plants are self-fruitful, always putting out at least one male flower.

‘Red Lady,’ is a red-fleshed solo variety grown commercially throughout the tropics. Reported to be tolerant of the papaya ring spot virus, this cultivar is vigorous, productive, and begins bearing at a young age. The large fruits weigh as much as 4½ lbs. We have also found that on this variety even the female plants are self-fruitful, always putting out at least one male flower. If you wish to purchase only one papaya plant, this is the variety we recommend.

‘Sunrise’ solo is the most popular papaya variety ECHO sells. The fruits are softball- to football-sized, exhibiting reddish flesh, high sugar content and a unique fruity flavor. Flowering and fruiting occur rapidly. We also carry ‘Sunrise’, a similar variety.

‘Waimanalo’ bears softball-sized, yellow-fleshed fruits that are sweet and pleasantly flavored. It is a Hawaiian solo papaya. Flowering and fruiting occur rapidly in this Hawaiian solo cultivar; however, it may be more susceptible to disease than other cultivars.

## Peaches and Nectarines

### *Prunus persica*

Why buy hard, flavorless, store-ripened peaches when you can grow scintillating, juicy peaches in your own backyard? The major setback in peach/nectarine production in Florida has been that cultivars require too long a period of cool temperatures to set fruit. This essential cooling period is measured in ‘chill units’. Chill units are the number of hours the temperature stays between 32-55° F. Most effective chilling occurs with continuing temperatures below 45° F. However, peaches with low-chill requirements have been developed in Gainesville, and are now being grown commercially throughout Florida. The varieties that we carry have produced in Homestead. Peaches and Nectarines prefer well-drained, slightly acidic soil. They are small, deciduous trees that grow to 15ft. For consistent, heavy production, trees require a thorough winter pruning, and heavy crops should be thinned to produce larger fruit. Low chill peaches and nectarines are self-pollinated and bear fruit April through May. Showy pink and white flowers will appear Feb-March.

### *Peaches:*

‘Flordaprince’ has delectable yellow flesh enclosed by attractive red and yellow skin. Over 60,000 acres are grown commercially in Egypt and this variety is recommended highly for southern Florida. Fruit set requires 100 or more chill hours.

✿ ‘Flordaglo’ is a white-fleshed peach with juicy flesh and superb flavor. Fruit set requires 100 or more chill hours.

‘Tropic Beauty’ is yellow-fleshed and slightly larger and sweeter than the Flordaprince, and ripens 9 days later. Fruit set requires 200 or more chill hours.

### *Nectarines:*

‘Sun Raycer’ is a new commercial variety that produces superior large fruit. Fruit set requires 150 or more chill hours.

✿ ‘Sun home’ is an attractive red-leafed tree that produces excellent red fruit slightly smaller than Sun Raycer. Fruit set requires 250 or more chill hours.

## Peanut Butter Fruit (Bunchosia)

### *Bunchosia argentea*

This tree is an ornamental and early fruiting bush or small tree. The yellow flowers are produced spring through fall and are followed by a nearly constant production of fruits in varying quantity. They are about the size of a medium-

## Fruiting Trees, Shrubs and Herbaceous Plants

sized fig. They must be picked every day since they spoil on the second day. The skin is extremely tender. They can be stored for several days in the refrigerator or can be separated from the seed and frozen. Some people enjoy the fruit fresh, while others do not like the flavor or somewhat peanut butter-like texture. The flavor is rich and sweet, similar to sweet potato. They are especially good when made into a milkshake. Our tree froze to the ground during the freeze of Dec.'89 but produced heavily the second summer after the freeze.

### Persimmon, Oriental

*Diospyros kaki*

**FCFS available.** These are not the tiny wild persimmons (*Diospyros americana*) of which you may have sordid and sour memories. Asian persimmons are highly esteemed throughout the world. The fruit is brilliant orange-red and can be eaten fresh when soft and fully ripe, or can be made into a milk shake or persimmon bread. Only the non-astringent varieties can be eaten when still firm, in which case it is almost like a different fruit. Some of the persimmons at ECHO have done very well, while others have grown poorly. Potential heavy production of tasty fruit makes them well worth a try. Most varieties do not produce well in extreme southern Florida due to lack of winter chilling. The trees are deciduous and require light pruning only. Persimmons are mostly self-fertile and can produce seedless fruits. Persimmon season in Florida is September through November. Fruit can be harvested unripe and allowed to ripen off the tree.

'Fuyugaki' is a non-astringent variety that is crisp and sweet when under ripe and soft like any other persimmon when ripe. This is the most popular variety in Japan but some years it does not fruit well in south Florida probably due to lack of chilling. Fully ripe fruits are medium to large and have a hint of cinnamon taste. Bears mid season.

'Hana-Fuyu' is non-astringent and one of the largest persimmons. The fruits are round. Bears mid-season.

'Saijo'. In Japanese, Saijo means, "the very best". The fruits are elongate, medium sized, astringent and of excellent sweet flavor.

'Tanenashi' means 'seedless' in Japanese. When ripened, the flesh is very smooth and deliciously sweet. This astringent variety produces heavily at ECHO mid to late season.

'Triumph' produces astringent, small, delicious fruit. A cultivar selected in Israel, this variety produces extremely well in our warmer climate, fruiting as far south as Miami. With a long fruiting season, Triumph persimmons can sometimes be picked into early winter.

Other varieties may be available upon request: Sheng, Gionbo, Hachiya, Ichi, Izu, and Matsumoto.

### ✿Pineapple

*Ananas comosus*

Pineapple was once a commercial crop in Florida, but moved to other countries due to labor costs and cold weather conditions. Under good conditions, pineapples are produced in one or two years after planting. The fruits are much sweeter when allowed to ripen on the plant. As your plant develops, you can propagate them on your own by selecting the most desirable planting pieces. Suckers, originating at the stem just above or below the soil level produce the quickest, largest, and best tasting pineapples. Slips and crowns are less desirable for planting out. Slips are growths that appear higher up the stem, above or below the fruit. Crowns are the top section of a fruit. These usually produce small fruits that take over two years to produce fruit. Select large suckers and let them cure in the shade for several days before planting. Pineapples can be planted in the sun or shade. A rich, moist soil is preferred and mulch is also helpful. The stiff, pointed leaves can be dangerous to eyes. Plants survive 28° F with leaf damage.

### Pitomba

*Eugenia luschnathiana*

**FCFS available:** "Selected Eugenia Species." Pitomba can fruit when less than 3½'. tall. The white flowers are showy and up to one inch across. The fruit is about one inch long and the thin skin is bright orange-yellow. The soft juicy flesh is aromatic and sweet to subacid in flavor. This attractive small tree is evergreen, spreading, and has dark green dense foliage. It is hardy to about 27° F.

### ✿Plum, Japanese

*Prunus salicina*

Similar to its relative the peach, plums are suited to well-drained and slightly acidic soil. They are small, deciduous trees that grow 10 to 15 ft. For consistent, heavy production, trees require a heavy winter pruning, and large crops should be thinned to ensure quality fruit size. Plums require cross-pollination with either wild plums or another domesticated

## Fruiting Trees, Shrubs and Herbaceous Plants

variety. We carry two Japanese low-chill plum varieties and recommend that both be planted within 100 ft of each other. 'Gulf Gold' is a dwarfed tree with yellow-skinned fruit. 'Gulf Ruby' is a red-skinned plum. Fruit of both varieties are standard plum size (2-3½" diameter), have yellow flesh, and are very sweet. Flowers appear in Feb-March, and fruit ripens April through May. *Note: The Loquat is sometimes called 'Japanese Plum' – see page 22.*

### Pomegranate

*Punica granatum*

Pomegranate grows as a shrub or small tree. The flowers are showy, exhibiting red and white colors. The fruit grows to 2 ½ to 5 inches wide and has a tough leathery rind. Inside are many sacks filled with transparent, juicy, crisp flesh and seeds. The fruit can be eaten fresh or can be juiced by cutting in half and pressing by hand onto an orange juicer. They will not ripen off the tree. The tree is tolerant of almost any soil type, but prefers a fairly dry climate. In southwest Florida it fruits better after a cold winter. Fruit can be produced the first year, but it usually takes 2 or 3 years. For the first three years, the bush should be pruned heavily to form a main stem with many short branches. After 3 years, only suckers and dead branches are removed. Pomegranate is hardy to about 12° F. In northern Florida the pomegranate bears July - November, but it may produce year round in the southern part of the state.

'Vietnamese' is a selection from Vietnam by Richard Wilson. It is said to be more tolerant of Florida's hot, humid weather.

'Wonderful' pomegranate originated in Florida. The fruit is very large, dark purple-red, with medium-thick rind. Juicy wine-colored pulp encapsulates medium-hard seeds that are difficult to chew. The plant is vigorous and productive.

### Prickly Pear Cactus, Spineless

*Opuntia* spp., syn. *Nopalea opuntia*

The pads of this cactus species are a popular vegetable in Mexico. Although spineless, the small brown prickly patches called "glochids" on the pads must carefully be peeled off with a knife or burned off before handling or eating. The rest of the skin is edible. We found one of our plants was free or nearly so of glochids which we usually have available. Pads are cooked as a vegetable, or diced and added to salads. Very young pads do not have prickles, but tend to be mucilaginous. Look in Mexican cookbooks under 'nopales' for recipes. Plants should be transplanted at least 4' apart as they will eventually become quite large. A large spineless prickly pear plant can be seen between the duck pond and the hillside farming demonstration. This spreading plant is enormous, over 20' tall.

### Purple Mombin

see *Mombin*, *Red* on page 26.

### Red Mombin

see *Mombin*, *Red* on page 26.

### Rheedia aristata

see *Cuban mangosteen* on page 17.

### Rose Apple

*Syzygium jambos*, syn. *Eugenia jambos*

**FCFS available.** Rose Apple produces a round, 1½-2" pale yellow fruit sometimes with a pink blush. The crisp flesh usually contains little juice and has the unique flavor of sweetened rosewater. The fruits are mainly eaten fresh by children but can also be made into jam if lemon juice is added. Fruiting starts in about four years and the main season in Florida is May through July. Fruit flies are a pest. This evergreen tree does well on many soil types and doesn't require much care. It reaches 25-40' and has a wide branch spread, making it a nice shade tree. It can tolerate several degrees below freezing. Our tree at ECHO was killed to the ground in the freeze of Dec. '89 and grew back rapidly.

### Sapodilla (Naseberry, Nispero)

*Manilkara zapota*, syn. *M. achras*, *M. zapotilla*

**FCFS available.** Native to the Yucatan, the sapodilla tree grows well in poor limestone soils and almost any other well-drained soil. It is drought resistant and can withstand wind and salt spray. It is almost equal to the date palm in its tolerance to high soil salinity. Sapodilla trees are beautiful, slow growing evergreens, capable of reaching a height of 60'. They are often used in windbreaks. Huge trees can be seen in Key West, and ECHO has smaller fruiting trees in our fruit tree arboretum. It produces latex, known as chicle, once used to give the chewy consistency in chewing gums. The fruit has brown flaky skin and translucent, gritty flesh. Sapodilla fruit pulp is very sweet with excellent, sometimes spicy

## **Fruiting Trees, Shrubs and Herbaceous Plants**

flavor, but it seems to ferment easily. Most varieties, including those we carry, are self-fertile. Mature sapodillas can withstand temperatures of 26° F. They bear May through September, but the season peaks in June and July.

‘Alano’ fruit is small to medium (4-9 oz), about the size of an orange with very smooth, or slightly grainy texture, juicy and moderately sweet. Self-pollinating. An excellent fruit, it bears well from November to June.

‘Brown Sugar’ bears heavily and is very sweet, almost to the point of being overpowering to some people. It is slightly grainy and gives high yields of smallish fruit (5-6 oz) from May to September.

‘Oxkutzcab’ is a variety new to ECHO's nursery. We do not know much about this cultivar, except that two reputable nurseries speak well of this fruit. It is a roundish Mexican cultivar that gives high yields of very good and extremely large fruit (up to 28 oz) from May to September.

‘Molix’ another football shaped fruit native to Mexico. This fruit is similar to Hasya in many ways, but it tends to be darker brown outside, less red inside, and the tree has curly leaves. The pulp is exceptionally sweet with a fine pear texture and pleasant aroma. The fruit are large typically weighing thirteen ounces. The season differs slightly from that of Hasya, beginning in February and ending in May.

‘Makok’ is long, pointed, and one of the best tasting in the world. It is native to Thailand, and it is a recent introduction to Florida. This is an excellent variety for homeowners because the tree is a small compact grower perfect for limited spaces. The pulp is smooth and brown with a sweet aroma. It ripens from May to November.

‘Tikal’ was selected in the United States but its origin is also Mexico. The fruit are ovoid in shape, but are fat at one end like a top. This variety was one of the first superior commercial varieties planted in Florida, but its popularity has diminished with the introduction of larger more productive cultivars. Fruit size can vary, but they can get as large as eleven ounces. The fruit ripen from December to March.

‘Silas Wood’ No information is presently available for this variety.

‘Hasya’ is a football shaped fruit native to Mexico where it is the number one commercial cultivar grown. The fruit is of excellent eating quality and it has a reddish hue throughout the pulp. The tree is a large upright grower, and it is a prolific producer of large fruit that typically weigh thirteen ounces. The fruit ripens from November to June.

### **Sapote**

see *Mamey Sapote* on page 35. Sometimes the *Sapodilla* (page 30) is also called “Sapote”.

### **Soursop (Graviola, Guanábana)**

*Annona muricata*

Soursop produces large fruits on its trunk and branches. The fruit is often used as a drink by mixing the juice with milk or water and sugar. Less acid varieties are eaten fresh. Production starts in three to five years in a seedling tree and occurs year-round. The tree is bushy, but has an upright growth habit and can reach 12-30 ft. A few degrees below freezing can kill the tree and near freezing temperatures defoliate it temporarily. We have soursops in our “Annona row” in our arboretum, behind the nursery trailer.

### **Spineless prickly pear cactus**

see *Prickly Pear Cactus*, *Spineless* on page 30.

### **Star Apple**

see *Camito* on page 10.

### **Star Fruit**

see *Carambola* on page 10.

### **Strawberry Guava**

see *Cattley Guava* on page 11.

### **Strawberry Tree (Jamaica Cherry)**

*Muntingia calabura*

This is a very fast growing, spreading small tree. It produces flowers and ripe small red fruit every day for most of the year. The flavor is poor to some people at first try, but is easy to acquire a taste for it as it exhibits consistent fruit production. The skin has a resinous flavor that can be avoided by squeezing the pulp out like a slipskin grape. We have

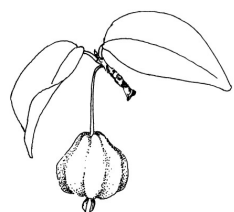
## Fruiting Trees, Shrubs and Herbaceous Plants

had no success using it in cooking. Freshly frozen fruits can be mixed with fruit salads while still frozen. Production should start the first year after planting. The tree has been killed by freezes at ECHO, but does well in more protected parts of southern Florida. The tree is somewhat susceptible to wind damage and flooding.

### Sugar Apple (Sweetsop)

*Annona squamosa*

**FCFS available.** This fruit is also known as sweetsop. It is a small tree and produces very unusual looking lumpy fruit. The fruit become soft when ripe so it is hard to market commercially. The sweet, flavorful flesh of most varieties is white, but a few varieties are red or purple. They are usually eaten as a dessert fruit, but can also be used to make ice cream and milk shakes. The dark brown seeds should not be eaten. Production starts in 3 or 4 years from seed and seedling trees are quite uniform with good quality fruit. The season is summer through midwinter. The tree loses its leaves when cold weather comes and can remain dormant until spring. They have poor tolerance to flooding and salt. 28 or 29°F does not seriously injure mature trees but young trees may be killed at 30°F. You can see some sugar apple trees in the “Annona” row in the arboretum behind the nursery trailer.



### Surinam Cherry

*Eugenia uniflora*

**FCFS available:** “Selected Eugenia Species.” Surinam cherry makes an attractive hedge and is commonly used in South Florida because it is hardy to about 22°F. If not pruned as a hedge, the tree can grow about 10-15’ tall, making a round, attractive shrub. The red or black fruits are small and variable in flavor. Some trees have good-tasting sweet fruits; others have a resinous aftertaste and can be sour. The black fruit varieties usually lack the aftertaste. Plants grown from seeds of black fruit are much more likely to produce good fruit. Production starts 1-3 years

after planting. Fruit flies are the only serious pest of this fruit. Surinam cherry shrubs can be seen on either side of the entrance to the nursery parking area, and in many other locations on the farm. It does not require much care or water (though it will benefit from both), making it one of our favorite “edible hedges”.

### Sweetsop

see *Sugar Apple* on page 32.

### Tamarind

*Tamarindus indica*

**FCFS available.** Native to Africa and naturalized around the world, the tamarind is an attractive tree valued for its shade and edible fruit. Adapted to both arid and moderately wet regions, this resilient tree is wind resistant and will withstand salt spray. Provided the soil is well-drained, tamarind produces well on various soil types, including, rocky and infertile soils. The trees are long-lived, grow 80-100’ in height and may have a 40’ spread. Though normally a large tree, tamarind is prized by bonsai enthusiasts due to the rough bark they develop while still small. A tree at ECHO has produced a few pods while growing in a 40-gallon pot. The skin becomes crunchy when ripe. The tasty brown pulp is sticky and sucked on like candy or can be made into a refreshing drink. It is also a popular element in Indian cooking. The taste is a mix of sweet and sour flavors. Grafted trees or cuttings can fruit in 3 to 4 years. Young trees are frost sensitive, but mature trees can take 28° F without serious injury.

### Wampi

*Clausena lansium*, syns. *C. wampi*, *C. punctata*, *Cookia punctata*, *C. wampi*, *Quinaria lansium*

Wampi is a distant relative of citrus. It grows well in southern Florida and is hardy to the mid-20s when mature and 28-30° F when young. Wampi has a pretty compound leaf with ruffled edges that make it an attractive ornamental. Small orange fruit is borne in clusters. The fruit skin is similar to a muscadine grape but contains a resinous oil that is unpleasant. The fruit pulp is white and subject to infestation by the Caribbean fruit fly. Crushed leaves have a smell very similar to anise.

### Water Apple

see *Wax Jambu* on page 32.

### Wax Jambu (Java Apple, Water Apple)

*Syzygium samarangense*, syns. *S. javanicum*, *Eugenia javanica*, *E. alba*

Wax jambu, or Java apple, produces abundant bell or pear-shaped fruits with thin shiny skin. The flesh is crisp and succulent. The flavor is mild with a hint of spice. It is often eaten fresh with salt. This spreading tree is fast growing

## Fruiting Trees, Shrubs and Herbaceous Plants

and can grow to about 30-40'. ECHO's tree has produced heavily for several years. Mature trees may tolerate 29°F. Fruit flies and cold can be a problem.

### West Indian Cherry

see *Barbados Cherry* on page 9.

### White Sapote

*Casimiroa edulis*

**FCFS available.** This tree is in the same family as citrus. It is frost and freeze tolerant and grows in a variety of soils. The trees are very easy to grow and produce a fruit that is sweet and soft like custard with no acid. Some people find the fruit terribly bitter while most people cannot detect the bitter taste. The season is April through midsummer. Fruit is produced commercially in California. Seedling trees may take many years to fruit.

✿ 'Bonita Springs' is a non-bitter cultivar with sweet flesh. Fruit is tennis ball-sized with few seeds. Does not require a pollinizer.

✿ 'SES #2' is a non-bitter variety.

✿ 'Spice Park Late' is a small fruit with no aftertaste bearing very late in the season.

✿ 'Young Hands Golden' is a new variety to our nursery. We presently have no information about this cultivar.

'Chestnut' Seedling of Suebelle. Tree large, heavy production, fruit has withstood shipping to eastern states. Spherical, yellow-green when ripe, taste good, skin bitter. Alternate bearing.

'Homestead' a Florida cultivar that is precocious and productive and readily tolerates Florida's heat and humidity.

'Sue Bell' The best known cv of sapote, still not surpassed in performance by others; common in nurseries. A distinct cv., Neysa was commonly sold as Suebelle from 1955-65. True Suebelle fruit is variable in size, usually small, yellow, asymmetrical, sweet. Pick when soft. Bears nearly year-round. Tree medium, for home culture.

'Vernon' A mature tree found by him and may prove to be another, older cv. Tree large, rounded, vigorous but medium height. Fruit green, round oblate; flesh white, not becoming bitter when over-ripe. Alternate bearing, over the winter months. Performs well in northern California. Difficult to graft.

## 2. Trees for the Enthusiast

This section includes plants sometimes available and recommended for the **ENTHUSIAST ONLY**. These plants are very difficult to grow in Florida mostly due to their lack of cold hardiness and may not be normally propagated or stocked by ECHO.

### ✿ Akee

*Blighia sapida*, syn. *Cupania sapida*

See Akee fact sheet before eating this fruit due to the **extremely poisonous nature of the unripe fruit**. Akee trees are easy to grow and do well on alkaline soils. The fruit has a leathery pericarp that splits when the fruit is ripe. When ripe, it can be eaten fresh, but it is usually cooked, boiled, or canned. There is a hypoglycine toxin in the unripe fruit that can be lethal. One little section is enough to kill a person if it is eaten before it is ripe. Once the fruit starts to break down and get soft and slimy, it may make you sick if you eat it, but that is not due to hypoglycine. Akee is the national fruit of Jamaica. Mature trees can survive short periods of 26° F without much damage, but young trees are more cold sensitive. It may grow to 35'.

### Ambarella, Dwarf (Golden Apple, June Plum, Otaheite Apple)

*Spondias dulcis*, syn. *S. cytherea*

The egg-sized fruits are borne in clusters of up to a dozen or more, on large panicles. Fruits are thick-skinned, fibrous, and drop from the tree while green. Before turning yellow, the flesh is crisp and somewhat acidic. It can be eaten out-of-hand, but is also prepared by stewing fruit with sugar. The dwarf ambarella was collected on a trip to Borneo and our original seedling tree has produced several crops in a pot. Ambarella is vigorous, but less cold hardy than its relative, the mango. Seedling trees produce after 4 years. The plant prefers some shade and shelter from wind.

## Trees for the Enthusiast

### ✿Assai Palm (Pina Palm)

*Euterpe oleracea*

Assai, or Açai, palm is a beautiful clumping palm from the Amazon region in South America. It grows to about 50 ft. and produces fruits that are mashed in warm water to make drinks and ice cream. It is rare outside the Amazon and apparently hard to keep alive after planting in the ground in Florida. It needs a wet or flooded location or water source. It also is highly sensitive to drought and cold temperatures.

### ✿Cacao

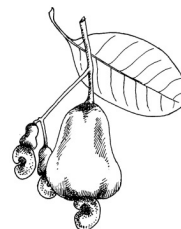
*Theobroma cacao*

Cacao produces a large yellow-orange shelled fruit with a small amount of edible sweet pulp. The seeds are the source of cocoa and may be fermented for a few days for best flavor. The skin then easily washes off and the seeds are dried and roasted. In Colombia the seeds are ground, mixed with a starchy white corn meal, then cooked and eaten like porridge. Fruit production can start when the tree is only about five feet tall or when the trunk is about one or two inches in diameter. They may produce well in a 40-gallon pot, but are sensitive to root disturbance and over fertilizing. Production may be better with two trees. Cacao grows well in floodplains in the Amazon. Freezing may damage or kill the tree. We have six cacao trees growing in the Rainforest Clearing demonstration area.

### ✿Cashew

*Anacardium occidentale*

Cashew produces a nut and a fruit. The nut grows to full size first, then the pseudofruit, or swollen stem, develops into the “cashew apple.” The apple has spongy, fibrous, very juicy, astringent, acid to subacid, yellow pulp that is eaten fresh or juiced. The nutshell contains a caustic resin. The nut and apple fall from the tree when they are ripe. The tree is not at all frost tolerant but produces in about two years in the tropics so it might produce in a large pot. Performance in southwest Florida is unknown.



### ✿Cherimoya

*Annona cherimola*

This small, spreading tree grows from 16 to 30 feet in height and is thought to have originated in the highlands of either Ecuador, Colombia or Bolivia. It would be most appropriate for the enthusiast only in southern Florida due to the less-than-ideal growing conditions. In addition to not thriving in the humid lowlands, cherimoyas may need to be hand pollinated to ensure good fruit set. It is, however, considered one of the most desirable fruits of the *Annona* genus. The fruit is usually large, either conical or heart-shaped. The flesh is white in color, aromatic, soft but not mealy, very delicious, and contains numerous black seeds, which resemble beans. They have reportedly borne fruit in East Fort Myers and we have seen a productive healthy tree in West Palm Beach. Cherimoyas are hardy to about 26° F.

‘Fina de Jete’ is an excellent shaped fruit with juicy, sweet flesh. When mature, black speckles may appear under skin. Matures mid-season. Spain’s main commercial variety.

‘Booth’ produces smaller fruit with small seeds, but there are many seeds in the fruit. Booth is very juicy, but very creamy at the same time, and has a nice acidic overtone that mellows out the sweetness. Booth trees aren't as vigorous, but have a nice, upright growth habit.

‘Honeyheart’ and ‘Dr. White’ have also been recently added to ECHO’s cherimoya collection.

### ✿Cola Nut

*Cola* spp.

The cola nut would be another candidate for the enthusiast due to its cold sensitivity and specific cultural requirements. This slow growing tree will reach 30 feet at maturity, and will fruit, under ideal conditions, in 8-10 years. The 8 to 10 inch pods contain several large seeds. In some species of cola nut, the seed coat is the edible commodity. In some cultures, the cola nut is chewed as a stimulant, because of its high caffeine content. Cola has traditionally been exported as an additive to beverages, hence the name.

### ✿Durian

*Durio zibethinus*

Durian is seldom, if ever, in stock at ECHO. We have never grown it successfully. The durian is a large tropical tree. The fruit is also large, like an American football with sharp conical projections all over it. When the fruit is ripe, it breaks apart into sections. The large seeds are surrounded by pulp of a custard consistency. It has a distinct smell that is rather strong and not exactly pleasant. Durian is extremely cold sensitive and poorly adapted to Florida soil.

## Trees for the Enthusiast

### Genip

see *Spanish Lime* on page 36.

### Golden Apple

see *Ambarella* on page 33.

### June Plum

see *Ambarella* on page 33.

### ✿Kwai Muk

*Artocarpus lingnanensis* or *A. hypargyraeus*, *A. hypargyrea*

**FCFS available.** Kwai Muk produces a 1 to 2 in. wide, orange to red fruit that is acid to subacid and excellent flavor. It can be eaten fresh when fully ripe, dried, or preserved. Fruit ripens Aug. to Sept. Male and female flowers are produced on the same tree but two may be needed for good fruit production. The tree grows slowly and is erect and good for landscaping. It is similar to mango and jackfruit in cold hardiness.

### Mamoncillo

see *Spanish Lime* on page 36.

### ✿Malay Apple

*Syzygium malaccense*, *syns. Eugenia malaccensis, Jambos malaccensis*

The Malay Apple produces a pear-shaped fruit with thin, shiny, pinkish or dark red skin. The flesh is white and can be dry or moist. It has a rose scent and pleasant sweet to acid taste. They can be eaten fresh or cooked like apples. There is usually one large seed in the fruit and some of the fruits are seedless. This attractive tree has dense shiny foliage adorned with intense pink flowers. In the tropics, the Malay Apple may climb to 60 ft.; however, trees are extremely cold sensitive and must be kept small in southwest Florida.

### Mamey Sapote

*Pouteria sapote*, *syns. P. mammosa, Lucuma mammosa, Achradelpha mammosa*

Also known simply as “sapote”. Because of its cold sensitivity, **only the enthusiast** should attempt growing mamey in southwestern Florida. The time between flower and fruit is about 2 years. The fruit weighs from ½ to 5 lbs., has a rough and leathery skin, pink to deep red, sweet flesh and generally contains 1-4 large seeds. The mamey is extremely popular in Tropical America and is known as the ‘Apple of Cuba.’ It is commonly added to ice creams and other desserts. In a more tropical climate the mamey can reach 60 to 130 feet in height. This is not likely in our area due to frequent frosts and occasional freezes.

‘Pantin’ is the only variety ECHO carries. It is the same as ‘Key West’

### ✿Mayan Breadnut

*Brosimum alicastrum*

This may have been a staple food for the Mayan Indians. The seed should be boiled or roasted. This species is recommended for the enthusiast only as it may not be well adapted to southwest Florida.

### Otaheite Apple

see *Ambarella* on page 33.

### Pejibaye

see *Peach Palm* on page 35.

### ✿Peach Palm (Pejibaye)

*Bactris gasipaes*, *syn. Guilielma gasipaes*

Also called pejibaye. It is usually a tall, clumping palm with spiny trunks and stems. The fruit is boiled about an hour in salted water. The flesh is yellow or orange, dry, mealy and sometimes has a trace of bitterness. The palm heart is very good raw or cooked. Fruit production begins in about 5 years in warm climates. The fruits are 1 to 2 inches wide and hang in clusters of 50 to 100 or more. They turn yellow, orange or red when ripe. It requires a tropical climate.

### Pina Palm

see *Assai Palm* on page 34.

## Trees for the Enthusiast

### ✿Rambutan

*Nephelium lappaceum*

Rambutan is somewhat similar to lychee, except it is strictly tropical. This is very seldom in stock at ECHO. We do not carry this unless we receive seeds from an overseas tropical source, since there are no mature trees to our knowledge in Florida. The likelihood of a plant surviving to maturity is slim. There have been rumors of warm pockets further south of us where people have grown it successfully. The tree can be male or female. The soil should be well-drained, acidic, and high in organic matter. Rambutan is very sensitive to excessive fertilizer application and is very cold sensitive.

### ✿Santol

*Sandoricum koetjape*, syns. *S. indicum*, *S. nervosum*, *Melia koetjape*

Santol is a fast-growing tropical tree reaching 50-150 ft. The fruit is yellowish, 1½ to 3 in. wide. It has an inedible rind and inside is white, fibrous sweet to sour pulp and 3 to 5 inedible seeds. The fruit is usually eaten fresh and clings to the seed. They ripen in Florida during August and September. The tree is better suited to acid soil, but will also do well on limestone. Santols are rare in Florida and are freeze sensitive, but they do well in protected areas of south Florida.

### Sapote

see *Mamey Sapote* on page 35. Sometimes the *Sapodilla* (page 30) is also called “Sapote”.

### ✿Spanish Lime (Genip, Mamoncillo)

*Melicoccus bijugatu*, syn. *Melicocca bijuga*

Spanish Lime produces a fruit similar in appearance to the lychee. It has a green outer shell with one large seed and translucent flesh. The flavor is subacid and refreshingly delicious. Male and female flowers are borne on separate trees and the fruiting season is June through September. The plants tolerate poor soil and arid conditions, but are very cold sensitive.

## 3. Fruiting Vines & Brambles

### ✿Blackberry

*Rubus idaeus*

‘Brazos’ was developed by Texas A&M University to be grown in long narrow patches and kept in bounds with a lawn mower. It does not need to be trellised. The berries are large and may need protection from birds. This should be fairly easy due to its low growth habit here in Florida. ‘Brazos’ perform better on acid soils and respond well to fertilizer and wood chip mulch. Partial shade may also be beneficial. ‘Brazos’ appears nematode resistant, and is definitely cold hardy.

### Black Raspberry

see *Mysore Raspberry* on page 37.

### Ceriman

see *Monstera* on page 36.

### Granadilla

see *Passionfruit*, *Giant Granadilla* on page 39.

### Grape

see *Muscadine Grape* on page 37.

### Monstera (Ceriman)

*Monstera deliciosa*

This vine is the only edible fruit-producing member of the philodendron family. The fruit looks something like a cross between an ear of corn and a pine cone and takes up to 18 months to ripen on the plant. The fruit can be picked after about a year and will start to ripen several days later. As the fruit ripens from the bottom up, segments of the inedible outer peel fall off. The inner segments can then be eaten and are similar to a combination of pineapple and banana. The black flecks in the fruit are floral remnants and can be eaten. The fruit should not be eaten before it is ripe since it contains oxalate crystals that irritate the mouth and throat. Eat in moderation when ripe. Ideal growing conditions for *Monstera* include moderate shade and



## Fruiting Vines & Brambles

moist soil. Too much shade inhibits fruit production. Conversely, full sun can cause the foliage to yellow. The plant can trail along the ground and climb trees. When exposed to frost, the foliage dies and freezing temperatures can kill the plant. One method of cold protection is growing them under trees, as one local homeowner has a productive monstera growing up an oak tree.

### Muscadine Grape

*Vitis rotundifolia*

**FCFS available.** Muscadine grapes are native to the South and are resistant to many of the pests of regular grapes. They are easy to grow, cold tolerant, and require a trellis. The vines are deciduous, begin leafing out in March, and bear Aug-Sept in the south. Muscadines are vigorous and require yearly pruning. Each winter, usually in January, cut new growth back to 3-4 inch long spurs. This seemingly radical pruning is necessary for a bountiful crop and manageable vine. Vine will bear the second year after planting. Muscadines often suffer magnesium deficiency, which is easily remedied with Epsom salts. Vines do well in almost any well-drained soil. The grapes have a tough skin and are excellent for eating out-of-hand, making juice, or producing preserves.

\*‘Alachua’ yields small ½ inch deep purple grapes with 18% sugar content. The flavor is very good. The vine is **self-fertile** and yields early-mid season.

\*‘Fry’ produces 1¼ in. bronze grapes with 21% sugar content. An old-standby cultivar, Fry yields good crops of sweet, excellently flavored grapes. Bears early-late season. *Requires cross-pollination from a self-fertile variety.*

‘Late Fry’ is a bronze **self-fertile** variety, with an 18-20% sugar content. It produces a late crop of very large clusters of good quality fruit in high yields. It is very vigorous.

‘Nesbit’ Black fruit, 18% sugar, self-fertile flowers. Produces large clusters of fruit, very productive, disease resistant, dry scar, ripens over a long period. Mid to late season production.

\*‘Noble’ produces small ¼-½ in. black grapes with 16% sugar content. The flowers are **self-fertile**. Noble grapes are used primarily for making juice and wine. Bears early–mid season.

\*‘Southland’ is a small black grape, about ½ inch, with 17% sugar content. The flavor is excellent, but the skin is very tough. Ison’s Nursery and Vineyard in Georgia rank this the number one variety for jelly, jam, or preserves. The vines are **self-fertile**.

\*‘Summit’ is a rose-colored grape with excellent flavor and 20% sugar content. These 1 in. grapes are sweet with a delightfully crisp flesh, even when ripe. *Vines produce only female flowers, requiring a pollinizer.*

‘Supreme’ is a black variety with a 23% sugar content. This is one of the largest muscadines developed at this time (2002). It is a very heavy producer, ripening mid-season. The skin is edible on the fruit. This variety is very vigorous and disease resistant, producing large clusters of fruit with a dry scar. *Requires cross-pollination from a self-fertile variety.*

‘Tara’ Bronze fruit, 17% sugar, self-fertile flowers, . Fruits are of good size, vines are very vigorous, high yielding, dry scar and cold hardy. Fruit ripens early to mid-season.

‘Triumph’ produces 1 in. bronze grapes with 18% sugar content. The skin is somewhat tough, but the flesh has good flavor. The vine is **self-fertile**. Triumph is a good table grape and is grown at a local U-pick farm not far from ECHO. Bears early to midseason.

### \*Mysore Raspberry (Black Raspberry)

*Rubus neoveus*

The Mysore raspberry is from India. If it is provided with some irrigation and mulched, this raspberry grows vigorously and produces fall through spring. Some shade is beneficial. Flavor is variable and is sweet only part of the year.

### Passionflower

*Passiflora edulis*

**FCFS available.** Named by early Spanish missionaries to South America who saw in these tropical vines the story of the crucifixion, or “passion”, of Christ, this unusual plant promises to be no less intriguing today. For Florida gardeners, not only can this vine produce exquisite flowers in a range of vibrant colors, several varieties also bear a delicious, exotic-tasting, aromatic fruit. There are two distinct forms of edible passionfruit that we typically carry in our nursery, the purple fruiting type and the yellow fruiting type, as well as various ornamental varieties. All are vigorous climbers and require a sturdy trellis or wire fence. We recommend planting young vines in the spring soon after danger of frost is

## Fruiting Vines & Brambles

past. Plant the vines 10-15 ft. apart in rows and allow the vines to intertwine to encourage cross-pollination. Within two years of planting, the vines are capable of yielding large quantities of fruit. The fruit is either picked from the vine or allowed to fall and gathered from the ground. The fruit is firm and has a rather tough, inedible rind. Inside is a cavity filled with orange-colored sacs of juicy pulp containing many small dark seeds. The pulp and seeds are easily removed from the fruit with a spoon. It is difficult, however, to separate the seeds from the pulp and both seeds and pulp are generally eaten together. Otherwise, the juice sacs may be pushed through a sieve or squeezed in cheesecloth to extract the juice alone. The highly concentrated juice when sweetened and diluted with water makes a delightfully refreshing drink. After a vine reaches two years old, a post harvest pruning should be done once a year to encourage new growth and increase fruit production. The vine has a productive life usually of 3-5 years. Root problems and vine decline are common where soil drainage is poor. Flooding kills the vine. We recommend planting the vines on mounds in low-lying and flood prone areas.

### Ornamental types:

‘Blue’ – *P. caerulea* Extremely fast growing, hardy passionflower producing egg shaped orange fruits with deep red, edible pulp, although not as tasty as the purple passion fruit. Flowers are ornate, multi-colored, with a minty scent much like the fruit of the pineapple guava.

‘Crimson (red)’ – *P. vitifolia* Small green-yellow passion fruit with edible pulp. The flowers are a beautiful deep red. Leaves resemble grape leaves and the vine is moderately hardy and can be killed back by freezing temperatures. Grown as an ornamental.

‘Incense’ – *P. incarnata x cincinnata* This variety has large, showy purple scented flowers. This variety is a hybrid between two hardy passion flower species (*Passiflora incarnata* and *P. cinnicata*), and as a result, is very hardy itself, surviving temperatures below 0F. Vines will die back upon temperatures below 32F but will regrow from roots when the weather warms up again. While the vines are self-fertile and the fruits are edible, it is most commonly grown as an ornamental.

‘Lady Margeret’ – *P. vitifolia x caerulea* Large flowers of a unique Intensive red-magenta with a contrasting white center. Vigorous & free flowering this plant is easy to grow. Grown as an ornamental.

‘Lavender Lady’ – *Passiflora amethystine* Fragrant, lavender colored blossoms. Strictly for ornamental plantings, this non-edible passionflower vine is highly attractive to butterflies and bees. May die back with temperatures below 35°F but will regrow in the spring.

## Purple Passionfruit

### *Passiflora edulis*

The dark-purple egg-shaped fruits of this vine grow to 2” in length and weigh 1-1.5oz. The pulp of the purple fruits has a delightful aroma and flavor with a higher proportion of juice, but milder flavor than that of the yellow varieties. They are nearly sweet enough to eat out-of-hand. The flowers of the ‘Purple Possum’ variety we carry at ECHO are self-fertile, so only one vine is necessary to get fruit set. In Florida, this vine flowers during the spring and again in late summer (mid-August to late October). The best insect pollinator of passion vines in Florida is the carpenter bee, but native populations may not be large enough to ensure adequate pollination. You can encourage the presence of carpenter bees by placing hollow logs near the vines. Honey bees are less effective pollinators because they are too small and prefer to work other flowers when passion fruit is blooming. Hand pollination, therefore, will likely increase your yields. To hand-pollinate, simply dust each pistil with pollen from stamens of another flower. The purple passion fruit is better suited to cooler, subtropical conditions than either of the more tropical yellow passionfruit or giant granadilla vines, but even it is not likely to survive a severe freeze. The purple varieties tend to be more susceptible to root nematodes and fungal root infections. However, we have had success with the purple variety by planting them on mounds to promote good drainage.

## Yellow Passionfruit

### *Passiflora edulis* f. *flavicarpa*

The yellow fruits of this vine have a higher acid content and are best for cooking or flavoring drinks. The fruits are similar in shape but larger than the purple passion fruits. The yellow passion fruit vine blooms periodically year round. These vines are usually self-sterile, so to get fruit set, you need to plant two genetically different vines. While yellow passion fruit vines may be cross-pollinated by carpenter bees, it is highly recommended that you cross-pollinate by hand if you want a significant amount of fruit. Simply dust the flowers with pollen from a flower of a genetically different but compatible vine. Yellow passionfruit vines are more resistant to root nematodes and fungal diseases and less cold hardy

## Fruiting Vines & Brambles

than the purple types. The yellow types are also reported to tolerate alkaline soils, common to southwest Florida, if amended with the proper micronutrients.

### ✿ **Passionfruit, Giant Granadilla**

*Passiflora quadrangularis*

Naturalized throughout the humid tropics, the giant granadilla is well-noted for being the largest of the passionfruits. The fruit of this thick, square-stemmed vine may grow to 12" in length, 6" in width, and weigh up to 6 pounds. The oblong fruit, when ripe, has a thin, delicate skin, light green to yellow in color, and resembles a small melon. Under the skin is a thick, pale, mildly-flavored rind that can be eaten cooked or raw. The juice from the pulp has a more mild flavor than that of the other passion fruits. The large flowers of the granadilla are one of the prettiest of all the passion flowers. The vine flowers in the spring in Florida; fruits mature in the summer. In southern Florida, the vine may continue to flower all summer long, but the fruit will be misshapen; when cooler weather returns, the vines will resume setting "normal" fruit. You may need to hand-pollinate in the late morning, within 4 to 6 hours of the flower's opening in the absence of insect pollinators. A strong trellis is needed to support this vigorous vine's wandering growth habit and heavy fruits. The granadilla's truly tropical nature limits its success in southern Florida.

### **Vanilla Orchid**

*Vanilla planifolia*, syn. *V. fragrans*

Vanilla produces greenish-yellow flowers during some summers at ECHO. One summer, the vine produced about a dozen pods. They usually require hand-pollination to set pods. Ask for more information about hand-pollination, if you need it. Vanilla flavoring is extracted from fully grown but not fully ripe pods, which are fermented, cured and soaked in alcohol. The plant grows into a long vine, grows better in partial shade, and is cold sensitive.

## 4. Tropical Vegetables

### ✿ **Arrowroot (Tapioca, Yuquilla)**

*Maranta arundinacea*

Also known as West Indian Arrowroot, the tubers can be eaten raw, roasted, or grated into meal. The highly digestible starch is used in pastries and to thicken gravies, soups and sauces without adding a mealy taste. The roots should be dug before the plant dies back in the fall. The growing tips of the roots are tender, but with age the root becomes very fibrous. The fibrous root can be sliced into thin pieces to make the fibers short and easy to eat. It is related to the canna plant and grows about 2-3 ft. tall.

### **Basket Vine**

*Trichostigma octandrum*

Basket vine grows as a large, perennial, sprawling vine-like bush. It is called a vine because of the pliable stems that are used in making baskets. The young leaves, eaten after cooking, are an outstanding green vegetable. They are reported to be extremely nutritious. Discard the cooking water. Some users boil the leaves a second time in fresh water to remove any traces of bitterness. It has been killed to the ground in a freeze at ECHO.

### ✿ **Belembe**

*Xanthosoma brasiliense*

Belembe is one of our favorite leafy vegetables. Dr. Franklin Martin refers to it as the "Queen of Spinach." It looks similar to a small elephant ear plant, but produces only a small corm from which it is propagated. The leaves and stems are eaten. The leaves can be boiled or added to soups; the stems are cut into about half-inch long pieces, then boiled. You can serve them separately on the same plate as two different vegetables. A little vinegar added after cooking improves the flavor. It is important to thoroughly cook the stems of this plant since they contain calcium oxalate crystals, which sting the mouth and throat. (The reason we cut larger stems to only 1/2 inch lengths is to help boiling water dissolve the crystals. Younger stems can be cut into longer pieces). However, if overcooked, they resemble a tasteless rhubarb sauce. The cooking water should be drained. The texture of the stems is a little like tender asparagus and the flavor of the leaves and stems is very mild. The older leaves and stems are nearly as good as young ones. Belembe must be planted in a rich, damp, organic soil to grow well. It does well in flooded or poorly drained areas where other crops cannot grow. It can reach four feet under the best conditions and at ECHO is around 1-2 ft. tall.

## Tropical Vegetables

### Cassava (Tapioca)

*Manihot esculenta*

Also known as 'Yuca' and 'Manioc', this important root crop is grown as a staple food in many parts of the world. ECHO sells both a good production variety and a variegated, ornamental variety (which can be used like regular cassava). Cassava is tolerant of drought and poor soil, but needs good drainage. It is a perennial shrub that can be harvested for its roots after about 8 months to one year. Our cultivated varieties grow to about 8 ft. and tend to sprawl. The ornamental variety grows to about 6 ft. and is more compact. The young, fully expanded leaves can be eaten cooked and contain 11-39% protein on a dry weight basis. Both the leaves and roots contain cyanide so the leaves should be cooked fifteen minutes and the water drained. This reduces cyanide to a very low level. The roots should also be thoroughly cooked and eaten in moderation. The cultivated variety ECHO sells has red petioles and is said to be high-yielding. This cultivar is reported to be of high quality with large, sweet, tender roots that can be peeled and frozen for long-term storage. Cassava is frost sensitive but can resprout from the underground part of the stem if a freeze kills it to the ground.

### Chaya

*Cnidoscolus chayamansa*

**Fact sheet available.** Chaya is sometimes called the "Spinach Tree". Its large leaves are boiled and eaten, especially in Mexico. It is also used to wrap tamales. The plant becomes a shrub about the height of a person and is quite attractive. Occasional pruning will make a more compact, bushy plant. **THE LEAVES MUST BE COOKED FIVE MINUTES IN BOILING WATER** because they contain a small amount of cyanide. Do not use raw. Most varieties of chaya have small stinging hairs that are harmless after cooking, but the variety ECHO sells is free of these hairs. A USDA study in Puerto Rico reported that one can get higher yields of greens with chaya than any other vegetable they have studied. It is unique in that it is exceptionally resistant to the hot humid weather of a Florida summer and to extreme dry weather. Insects have not bothered chaya at ECHO. It sometimes blows over in a storm when planted in Florida sand. This often makes for a prettier plant, as the main stem sends up additional stems and a more bushy plant results. A freeze produces the same results and frost kills the leaves.

### ☼Chayote

*Sechium edule*

Sold in the produce sections of Florida supermarkets, Chayote is a prolific vine producing many firm, light green, pear-shaped fruits. Excellent as a cooked vegetable, or sometimes eaten raw, chayote is a good addition to stir fries and soups. The vine fruits heavily during the fall and winter, but can produce other times of the year. It is frost sensitive and does not tolerate flooding or even a high water table. Chayote requires some type of trellis to support the vigorous vine and weight of the fruit.

### Cranberry Hibiscus (False Roselle)

*Hibiscus acetosella*

Also known as 'False Roselle', this species has striking red leaves similar to a Japanese maple. It can be planted in the spring and kept pruned for an attractive annual shrub and may be grown as a temporary hedge. Cranberry hibiscus is nematode and insect resistant and does well in sandy soil. The young tender red leaves have a tart flavor and are an attractive addition to salads, slaws, or stir fries. In the fall it has pink blossoms. About thirty blossoms can be picked at dusk after they have folded, and blended with lime juice and sugar to make a beautiful and tasty drink. The petals add a bright red color rather than any special flavor.



### Cocoyam (Malanga, Tannier, Yautia)

*Xanthosoma* spp., *X. sagittifolium*

Known also as 'Tannier' and 'Yautia', this starchy root crop of the lowland American Tropics looks like what many of us call "elephant ears" and is from the same family. This plant produces a central corm, surrounded by smaller potato sized cormels. These cormels, like potatoes, are high in carbohydrates, contain 2-3% protein, and moderate amounts of vitamins and minerals. These can be served boiled or roasted. Young, unfurled leaves of some varieties are also eaten as boiled vegetables or served in soups and stews. They should be thoroughly cooked. Cocoyam take up to a year or more before yielding a significant crop of cormels. They are often grown in shade, which helps protect them from the cold as the leaves are killed by frost.

## Tropical Vegetables

### Eddo

*Colocasia esculenta*

This perennial vegetable is native to Tropical Asia. Similar to taro and dasheen, but smaller. The eddo produces an abundance of underground side corms that are boiled or baked.

### Edible Hibiscus

*Abelmoschus manihot*

Edible Hibiscus grows to about six feet tall. Only during January does it produce yellow hibiscus-type flowers. The large, attractive leaves can be used in salads, stir-fries, soups or other dishes. A single leaf can cover a slice of bread in a sandwich and is used like lettuce. The leaves are tender when raw but turn slimy if overcooked. They are highly nutritious. Add compost to the soil before planting to reduce nematode damage. The plant is frost sensitive.

### False Roselle

see *Cranberry Hibiscus* on page 40.

### Galangal, Greater

*Alpinia galanga*, *syns. Languas galanga, Kaempferia galanga*

The leaves of this ginger relative have an amazingly pleasant smell. The aroma can be enjoyed simply by pinching off a piece of the leaf. Makes a nice 4-foot-high hedge. We are told it is an ingredient of a soup at the Thai restaurant in Cape Coral, and have also heard it used in rice dishes and to wrap fish. It makes an ornamental hedge, growing about three feet tall producing striking, white flowers, and is currently growing outside ECHO's bookstore. If you learn how to cook with it, let us know! We sometimes have Lesser Galangal (*Kaempferia galanga*) available.

### Garlic Chives

*Allium schoenoprasum*

Garlic Chives make a great grass-like border, thriving through all seasons here in Florida. And they make a great addition to an herb garden. They do best in moist soils and grow well in sun or partial shade. The leaves are used like green onions or chives to add flavor to salads and soups. They also make a delicious herb butter and are popular in Oriental cooking. They should live for years, with clumps growing larger each year. Garlic Chives do not form a bulb and rarely bloom in southwest Florida.



### Katuk

*Sauropus androgynus*

**ECHO Fact sheet available.** Katuk, a delicious hot weather green vegetable, is one of the staple vegetables in Borneo. It has become one of the favorite salad greens of the staff at ECHO, and is used either cooked or raw for its nutritious leaves and shoots. The unique flavor of these leaves is most similar to peanuts. It grows very well in Florida. Katuk is disease and pest resistant, tolerates most soils, and grows in sun or shade. For the best tender shoots and leaves, grow Katuk in half shade and fertilize frequently. This shrub should be kept pruned at 3 to 6 feet since it tends to grow straight up until it falls over. It grows very slowly during cool weather, and can be killed back by a frost or freeze but grows back from

the ground and may re-grow bushier than before.

### Lemongrass

*Cymbopogon citratus*

Lemongrass makes a fragrant and attractive edible border or specimen plant. The blades, when crushed, or rubbed smell like lemon. The plant grows to about three feet tall and divides from the base of the plant, rapidly forming a large clump. The leaves can be dried or used fresh to make lemon grass tea. Only consume the tea in moderation.

Lemongrass will be killed to the ground by a hard freeze, but will probably come back. After a couple of years clumps become less attractive and should be divided and reset.

### Malanga

see *Cocoyam* under "Tropical Vegetables" on page 40.

### Manioc

see *Cassava* under "Tropical Vegetables" on page 40.

## Tropical Vegetables

### Moringa (Drumstick Tree)

*Moringa oleifera* syn. *M. pterygosperma*

**Technical Sheet and Recipes available.** Moringa has been one of the most requested seeds in ECHO's seedbank. This is due to its many edible parts and its ability to survive in arid parts of the world. It is an exceptionally nutritious vegetable tree. The large frilly leaves can be broken off easily at the stem and carried inside. The tiny leaflets can then be quickly pulled off between the fingers. Tender growing tips can be cooked stem and all. At ECHO, leaves are boiled as any green or added to soups or rice. In the southern portions of the United States the tree will probably survive a hard freeze but may be killed to the ground. Even where no freeze damage occurs some people cut it back to about 4 feet each year to force the leaves to be closer to the ground for ease of harvesting. If not forced to branch by pruning, the tree becomes tall, spindly and not very attractive. **We do not recommend it as a prominent shade tree**

Moringa might have potential as an annual vegetable in the North (trees started in the greenhouse grew to 8 feet in Wisconsin). Aside from eating the leaves, very young pods can be cooked and eaten like asparagus. Pod production is variable and seems to be increased by stress. Some trees bloom at less than a year old and others take longer. Blossoms are edible and taste similar to a radish. When trees are about 3-4 feet tall they can be pulled out of the ground and the roots grated and used like horseradish. The root bark is toxic and should be peeled off before grating. Only eat the roots in moderation. Crushed raw leaves may irritate the skin and if eaten are purgative. Under good conditions the tree can easily reach 15 feet the first year. The wood is very soft.

### Moringa, African

*Moringa stenopetala*

This is another species of moringa and is used the same way as the regular moringa. The leaves are larger and easier to prepare for cooking. It seems to be more drought tolerant, but slightly less cold tolerant. It has not yet produced seed at ECHO, and is very rare, with seeds only available from N.E. Africa and Haiti.

### Okinawa Spinach

*Gynura crepidioides*

Okinawa spinach forms a dense, non-vining, edible ground cover that grows well in full sun or partial shade. Grown commercially in China, the plant is a vigorous, perennial vegetable that is adaptable to a variety of tropical climates and requires little if any additional input. Okinawa spinach has attractive pointed leaves that are green on the top side and purple underneath. Young leaves and shoots can be eaten raw or cooked; at ECHO we use them as a colorful and nutritious addition to our salads.

### Roselle (Sorrel)

*Hibiscus sabdariffa*

Also called 'Florida Cranberry' and 'Jamaican Sorrel', this drought tolerant woody shrub may grow to 10 ft. high. An attractive annual that produces several hibiscus-type flowers that are pale yellow with a deep wine center. Roselle forms flowers and then seedpods when the days become short, usually during September and October. The edible calyxes, which grow around the seedpod in winter, are used in Jamaica to make a traditional Christmas drink called sorrel. The fleshy red calyx should be picked when about 1" long and can be used in jellies, sauces, and herb teas and punches. Although the leaves and stems are sour, they are high in Vitamin A and may be eaten raw, cooked or dried. Roselle is nematode and frost sensitive (Also see Cranberry Hibiscus).

### Samba Lettuce (Sissoo Spinach)

*Alternanthera sissoo*

Sissoo spinach is another name for this edible, perennial groundcover. This tropical vegetable is vigorous and spreading, but not considered invasive. The leaves are not slimy, and require steaming or boiling when served because of the presence of oxalates. Those that normally cannot stomach green vegetables usually do not mind this mild flavored green. It makes an excellent addition to dishes or can be eaten alone as a green. Samba lettuce thrives in 50% or more shade and benefits from nitrogen. Leaves will yellow in the absence of nitrogen, but will respond within days to a soil amendment.

### Sissoo Spinach

see *Samba Lettuce* on page 42.

### Sorrel

see *Roselle* on page 42.

## Tropical Vegetables

### Sweet Potato

#### *Ipomoea batatas*

We have several varieties. They need very warm growing conditions so should be planted spring and summer and harvested four to five months after planting. Propagation is by cuttings stuck directly in the ground or by small fleshy root pieces. Vine tips are high in protein; they may be cooked and eaten. ECHO sells cuttings when our plants have attained some size each summer, and occasionally potted plants.

‘Colorette’ is an early, light orange, semi-sweet variety that is high yielding, but not the best quality (may discolor and have a strong flavor).

‘Ivoire’ is an early, white, non-sweet variety. It can be cooked and used just like a regular potato (regular Irish potatoes do not grow well in the hot climates where sweet potatoes thrive).

‘Suabor’ is an off-white, sweet and smooth variety, which is early producing and can be harvested at 10-12 weeks.

‘Topaz’ is an orange, sweet variety released in 1988 from Texas. It has some drought resistance and very compact growth habit.

‘Toquecita’ is a white variety, which gets its name from its “little touch” of sweetness. This vigorous cultivar consistently out-yields all other varieties at ECHO.

‘Viola’ has purple skin with white flesh. Viola is mildly sweet with excellent flavor. The compact growth habit allows for easier management.

### Tannier

see *Cocoyam* under “Tropical Vegetables” on page 40.

### Tapioca

see *Arrowroot* under “Tropical Vegetables” on page 39 or *Cassava* under “Tropical Vegetables” on page 40.

### Water Chestnut

#### *Eleocharis dulcis*

This popular ingredient of Chinese cooking can be easily grown in an inexpensive plastic wading pool from K-Mart. The best planting time in south Florida is March through June. Place 4-6 plants on the bottom, stuff pine needles tightly around them and periodically add some fertilizer. Keep flooded with water. When the tops die down in November, you should find dozens of “chestnuts” on the bottom. Corms can be stored in moist mud or refrigerated at 50 to 55° F. They should not be allowed to dry out.

### Yam

#### *Dioscorea alata*

The tropical yam is often confused with sweet potato, which is sometimes called ‘yam’ in the United States. Those who know the tropical yam, however, will not mistake it with sweet potato. Yam is a tuber crop that is well known throughout the humid tropics: in Tropical America, the Caribbean, Africa, and Asia. The yam is an important carbohydrate food that is relatively easy to grow. Yams have a very specific life cycle. Unlike the sweet potato, which can be planted by vine cuttings almost year-round, the yam is planted once-a-year, when the tuber begins sprouting. At ECHO, this usually begins in February and March. As the tuber breaks dormancy, the energy is transferred from the tuber into stem and leaf growth. This vegetative stage, lasting 6 to 8 months, occurs during the warm and humid summer months. A new root system and tuber develops with most of the tuber development occurring toward the end of the rainy season and into fall. When the vine dies back, the tuber is ready for harvest. At ECHO this usually occurs in late November.

Yams do well in sun or partial shade and prosper with ample rainfall. They require good drainage, and therefore, are often planted on mounds or ridges. They are most commonly staked but can be planted on a trellis or at the base of a sufficiently strong tree. At ECHO it has worked well to stake them with bamboo, not more than 1 inch in diameter as the vines have some difficulty twining up the large bamboo’s slick exterior. Growth is lush and very vigorous once the rains begin. Remember the vines die back in the fall. They then get a number of leaf diseases and look sickly; however, this has little affect on the tuber. When harvesting, be careful as the tuber skin is thin and easily damaged. The tubers are often large, several lbs. a piece, but as great as 15 lbs. or more. The yam is used similar to a potato—peeled, then boiled or baked. Peel away any discolored areas. They reportedly make a good French fry and chip. The storage life is short, averaging maybe 2 or 3 months, due to the high moisture content. One recommendation is to harvest them as needed

## Tropical Vegetables

when they are in the dormant stage. If unused, the tuber will begin to sprout in the spring. The yam sprouts first at the top, which is the most desirable planting piece next to a whole 'seed' tuber. Cut off a section about the size of an adult's fist and cure it a few days in the shade before planting. ECHO carries several varieties, available only in the winter months. Yam is a wonderful food and is generally an easy, dependable crop to grow.

### Yautia

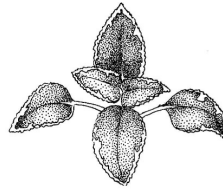
see *Cocoyam* on page 40.

### Yuca

see *Cassava* on page 40.

### Yuquilla

see *Arrowroot* on page 39.



## 5. Herbs & Spices

Throughout the ages, herbs and spices have been used to enhance (or mask!) the flavors in an otherwise monotonous diet. While “herb” and “spice” often appear together, they are easily differentiated. The leaves of fresh or dried plants are considered herbs. Other aromatic plant parts: the bud, fruit, berries, roots, and/or bark are known as spices. For the most part, spice trees and other spice plants, are native to the tropics. In southwest Florida, we are fortunate to be able to grow many of the most popular spice trees in our own backyards with surprisingly little upkeep.

Just as in other regions, herbs and spices have their own special growth seasons in southwest Florida. Calendula, Coriander, and Italian Basil are among the herbs that grow during cool weather. We don’t attempt to supply cool weather herbs during our hot tropical summers. Conversely, plants such as Patchouli, Caribbean Oregano (*Lippia micromera*), Pappalo, and Vietnamese Coriander may not be available in cool weather.

Mints grown at ECHO include Peppermint, Chocolate Mint, Orange Mint, Pennyroyal, Spearmint, Pineapple Mint, Grapefruit mint, Corsican Mint, and several others. Different mints have favorite growing environments. Rosemary may not be available from May through October when it is difficult to transplant. Garlic Chives grow well year round. Generally in hot weather, Anise, Cinnamon and Lemon Basils are easy to grow. Sweet basil usually grows throughout most of the year. We now offer plants that are harder to find, such as African Tree Basil, Poole’s Castle Artemesia, small Garlic Acacia trees, greater and lesser Galangal Ginger, Vanilla Orchid, and other plants that are nice to add to an herb/spice collection. Call before you come regarding availability, and someone from our herb crew will return your call within a couple days.

Some of the herbs and spice plants that we have carried in the past year include:

African Tree	Coriander	Italian Parsley	Purple Sage
Basil	Corsican Mint	Lemon Balm	Rosemary
Aloe	Cuban Tilo	Lemon Basil	Rue
Anise	Curry	<i>Lippia dulces</i>	Sage
Apple Mint	Dandelion	<i>Lippia micromera</i>	Salad Burnet
Artemesia	Dark Opal Basil	Lemon Mint	Society Garlic
Arugula	Dill	Lemon Grass	Spearmint
Basil	Fennel	Lettuce Leaf Basil	Spicy Globe
Butterfly weed	French Lavender French	Licorice Basil	Basil
Calendula	Sorrel	Orange Mint	Tansy
Catnip	Galangal (lesser)	Pappalo	Thai Basil
Caraway	Galangal (greater)	Parsley	Thyme
Chamomile	Garlic Acacia	Patchouli	Tropical Oregano
Chervil	Garlic Chives	Pennyroyal	Tarragon,
Chicory	Ginger	Peppermint	Mexican
Chocolate Mint	Grapefruit Mint	Pineapple Mint	Turmeric
Cinnamon Basil	Greek Oregano	Pineapple Sage	Vietnamese
Clary Sage	Horehound	Poole’s Castle	Coriander
Comfrey	Italian Basil	Purple Ruffle Basil	Winter Tarragon

We constantly acquire plants for our gardens. If they succeed, they are added to our sales list.

**ECHO carries a small collection of spice trees including:**

### **Allspice (Pimento)**

#### *Pimenta dioica*

Allspice, also called pimento, Jamaica pepper, or Myrtle pepper, is native to the tropical Americas. The name “allspice” describes its flavor, which resembles a combination of nutmeg, cinnamon, and cloves. This compact and handsome evergreen tree has aromatic, leathery leaves. In southwest Florida, allspice will grow to a height of 15 ft. and width of 10-15 ft. in about 10 years. Berries are produced at about seven years or earlier on female or bisexual trees. Some trees are male. While the trees in this area may not produce berries (4% essential oils), the leaves (about 2% essential oil) are used whole in cooking and potpourris, either dried or green. Freezes have killed allspice trees at ECHO; mature trees are hardy only to 27° F. Fungus is a common problem during some seasons of the year.

## Herbs & Spices

### Annatto

see *Lipstick Tree* on page 46.

### Anise, Florida Star

*Illicium floridanum*

True star anise *Illicium verum* is too tropical to grow in Southwest Florida. However, Florida star anise is a fast growing, evergreen shrub native to the southern United States. Thriving in a cooler environment, this hedge species grows as far north as North Carolina. The flowers can be red, yellow, or white, and produce a brown fruit. When ripe, the fruit unfolds into a highly aromatic star-shaped pod. Each point of the star encapsulates a tawny seed. Both the seeds and pods are used in Asian cooking, confectionery, and pickles. The leaves are used fresh or dried to add anise (licorice flavor) and fragrance to foods.



### Bay Leaf (Laurel)

*Laurus nobilis*

Bay laurel is also called Sweet Bay or Laurel. Believed to have originated from Asia Minor; however, it is often considered a native of the Mediterranean region having been naturalized long ago. In ancient Greece and Rome, poets were honored with crowns of laurel and declared *poets laureate*. We use a derivative of this phrase today when we receive a Baccalaureate degree. An evergreen tree with glossy dark green leaves and aromatic fruits, the bay leaf tree in SW Florida will remain compact. The fruit of the bay tree is a glossy blue-black berry ½ inch in diameter, but the leaves are the commodities of value. In the kitchen, you will find the dried leaves go in and with almost everything, from savory meat and fish dishes to pasta sauces and even sweet dishes, such as custard. Bay is also used as an additive in soaps. The bay leaf tree at ECHO has survived several freezes unscathed; they are considered cold hardy to 24°F.

### Bay Rum (Wild Clove)

*Pimenta racemos*

Bay Rum, also called Wild Clove, is upright in habit. Though exceeding 40 ft. in the tropics, Bay Rum remains small in SW Florida. This fragrant evergreen is native to the West Indies and South America. The Bay Rum tree has flaky bark, leathery leaves, aromatic flowers, and small black fruit. The leaves have a refreshing fragrance reminiscent of clove and allspice (close relatives). This aroma was formerly captured by distilling the leaves in rum, and used as an after-shave and hairdressing. Now the oils are extracted with water and are used in cooking, and perfume blends. Bay rum is less cold hardy than allspice.

### Cinnamon

*Cinnamomum zeylanicum*, syn. *C. verum*

Cinnamon is an evergreen, heavily branching tree that in this area will likely remain under 20 ft. The spice itself is the bark, peeled from the branches. When grown commercially it is maintained as a coppiced (periodically cut) bush and the bark is harvested. The day after harvest the outer corky bark is scraped off and the inner bark is allowed to curl into the familiar cinnamon sticks as it dries. The leaf petiole can be chewed for a cinnamon flavor. The tree will perform best in acid soils, and the growth rate is moderate. Cinnamon will not tolerate temperatures below 29° F.

### Curry Leaf Tree

*Murraya koenigii*, syn. *Chalcas koenigii*

This is one of the ingredients of Indian curries. The leaves have sold for \$25 per pound in New York. They can be fried in oil, then used to prepare a curry. Dried leaves can be ground to a powder and then used in marinades or to flavor vegetables. This small tree grows fairly slowly and is attractive. It tends to send up many suckers from the roots. It produces small white flowers that beneficial insects like to feed upon. Later, edible purple fruits develop, but may be hidden under new foliage. Irrigation is helpful in the dry season. Our tree froze back to about 1 inch diameter branches in the Dec. '89 hard freeze, but soon had thick bushy regrowth.

### Laurel

see *Bay Leaf* on page 46.

### Lipstick Tree (Annatto)

*Bixa orellana*

This small bushy tree is the source of the natural coloring, annatto, used to color foods such as cheddar cheese. In Spanish, annatto may be called 'achiote'. The Lipstick tree produces showy pink flowers and 1" oval pods which can range from green to bright red in color. Inside each pod are maybe 40-50 seeds not larger than a peppercorn. The

## Herbs & Spices

processed seeds are the source of the tropical spice, annatto. The seeds are easily processed for home use. Stir the seeds in a small amount of alcohol, strain, mix the liquid with corn meal or starch and dry well. This high-carotene coloring is traditionally added to rice dishes, cheeses, soaps, and fabric. The trees may be frost sensitive, but they have resprouted after freezes at ECHO.

### Pimento

see *Allspice* on page 45.

### Wild Clove

see *Bay Rum* on page 46.

## 6. Bamboo

Bamboo is one of the most useful and versatile plants in the world. A member of the grass family, it is best known for its use as a construction material and is grown for shade, animal fodder and food. It is also highly valued as a landscaping plant. Its more than 1000 species (more than 100 are in popular cultivation) are so diverse that it is safe to say there is a bamboo to suit any need.

When selecting a bamboo for home or garden, it is important to select the growth habit best suited to the area. Generally, the temperate bamboos tend to be runners while the tropical bamboos tend to be clumping (ECHO stocks clumping varieties only). *Running* bamboo spreads underground, often by sending shoots several feet from the original culm (and potentially into one's neighbor's yard). *Clumping* bamboo sends up new shoots only a few inches from the culm, creating a tight clump. Though the clump size will increase yearly, it does not spread as extensively as running types.

### Planting and Care of Bamboo

Please read our general instructions on planting nursery trees on page 53 – most of the same considerations apply. Bamboo prefers full sun. Provide new plantings ample water, fertilizer, and protection from competitive weeds. Apply at least four inches of mulch to newly planted bamboo. Water thoroughly after planting. When newly planted, especially during hot weather, water thoroughly at least twice a week. Once established, water as needed. Take care not to overwater though – excess watering (i.e. every day) can cause excess leaf drop. Well-established bamboos are rather tolerant of flooding, but newly planted bamboos can suffer from too much as well as too little water.

Most bamboos are happiest in a moderately acidic loamy soil. SW Florida soil is generally sandy, low in organic matter, and in areas with fill dirt, soils can be alkaline. Mixing organic matter, such as compost and/or manure, to the top few inches of the sand can counter the “droughtiness” and pH problems associated with many Florida soils. As mentioned above the soil should be covered with a thick mulch. Mulching the surface will keep the soil cooler, increase soil moisture, decrease weed pressure, and increase soil fertility. Over time bamboo creates its own mulch with its fallen leaves. Bamboo being a forest plant does best if its leaf mulch is kept over the roots and rhizomes, thus it is best not to rake up the bamboo leaves from under the plant. The leaves keep the soil soft and moist, and allow for the recycling of silica and other natural chemicals necessary to the bamboo.

*What types of mulches should I apply around the bamboo?* Almost any organic material is better than leaving the soil bare, but here are a few suggestions. Dried grass clippings raked up from a lawn work well for mulch. They are a source of nitrogen and silica. Hay is a good mulch too, but hay and manure from horse stalls can be a source of weed seed. Homemade compost or leaf rakings can certainly be used. If applying compost or manure, one should still apply a bulky mulch layer of grass, leaves, or wood chips to protect the finer organic matter from the sun—the direct heat will increase the breakdown rate and minimize its effectiveness. The type of mulch we use at ECHO is wood chips from tree pruning services. You can buy bagged wood chips at most major garden centers.

Bamboos can be planted at any time of the year in southwestern Florida and other areas with mild climates. If planting without irrigation, though not recommended, then a rainy season planting in July or August would be best. Over the years, success with bamboo will be greatly enhanced by consistent watering, an annual application of thick mulch, and fertilizing several times throughout the year.

### Varieties available and/or on display at ECHO

ECHO currently carries many clumping varieties. If you do not see the variety that you want, check with our staff and ask to be added to our ‘waitlist’. When we make periodic trips to other nurseries and wholesalers, we can inquire on your behalf. Please note that availability on the listed species varies enormously. Those marked by an asterisk (\*) are generally available. ECHO has a large in-ground collection of bamboo that can be seen when you visit the farm.

## Bamboo

The clump height and culm width refer to mature clumps of bamboo. The cold tolerances indicated also pertain to mature bamboos. Protect young plants especially from the cold.

---

*Bambusa chungii* (Blue Bamboo) Loose clumping. Height 30 feet. Culms 3". Cold hardy to 22 degrees. Striking blue-green culms covered with white powder. Used in paper-making and weaving.

\**Bambusa chungii* var. *barbelatta*. Clumping. Height 22 feet. Culms 1 ½". Cold hardy to 22 degrees. Grows to ¾ of the size of *B. chungii*. Striking blue-green culms covered with white powder.

*Bambusa emeiensis* cv. *Flavidorens* Clumping. Height 25-30 feet. Culms 2-3". Cold hardy to 25 degrees. Cultivated in China as an ornamental. A formal garden bamboo, with a nicely vertical habit. Yellow with dark green stripes.

*Bambusa emeiensis* cv. *Viridiflavus* Clumping. Height 25-30 feet. Culms 2-3". Cold hardy to 25 degrees. Same as *Flavidorens* but striation is reversed. Green with yellow stripe.

\**Bambusa lako* (East Timor Black Bamboo) Clumping. Height 50 feet. Culms 4". Cold hardy to 25 degrees. Has striking purple-black culms with green stripes. Very popular cultivar.

*Bambusa intermedia* Clumping. Height 30-40 feet. Culms to 3". Cold hardy to 25 degrees. Import from Yunnan Province, China, dark green, loose clumps.

*Bambusa membranaceous* Clumping. Height 70 feet. Culms 7". Cold hardy to 25 degrees. Very impressive bamboo with delicate leaves and jade green color. Young culms have a white powdery coating. Loose clumping.

\**Bambusa multiplex* 'Alphonse Karr'. Clumping. Height 15-20 feet. Culms ½-1" diameter. Hardy to 20 degrees or less. Has a smaller growth habit than other clumping type bamboos. Culms are bright yellow and green candy-striped culms. This is an excellent hedge material and windbreak.

\**Bambusa multiplex* 'Fern Leaf'. Clumping. Height 10-12 feet. Culms ½". Hardy to 20 degrees. Has a smaller growth habit than other clumping type bamboos. Culms are typically golden with an arching habit. It is known as Fern Leaf Bamboo for its leaves that resemble fern fronds. This is an excellent hedge material and wind break. Plant in full sun or partial shade.

\**Bambusa olhamii* (Giant Timber Bamboo). Clumping. Height 50 feet. Culms 3-4". Hardy to 20 degrees. It is an open clumping variety with erect culms and dark green leaves. It is extremely cold hardy and makes an excellent wind-break, shade or privacy hedge. This variety is well known for its edible shoots. Mature culms may be harvested for quality poles.

\**Bambusa textilis* (Weaver's Bamboo). Clumping. Height 40 feet. Culms 2 ½". Hardy to 20 degrees. It is a hardy and handsome variety, with extremely tight clumping and straight growth. Dark green culms turn gold in the sun. Highly recommended.

\**Bambusa textilis* 'Kanapaha'. Clumping. Height 50 feet. Culms 2 ½". Hardy to 20 degrees. Lower half of culms are prominently blue and branchless. This is a particularly regal selection from the Kanapaha Botanical gardens in Gainesville, Florida. Highly recommended.

*Bambusa textilis albostrigata*. Clumping. Height 40 feet. Culms 2". Hardy to 20 degrees. Tight clumps. An extremely handsome plant with straight growth. This variety has white stripes. The thin walled culms are used for weaving.

\**Bambusa textilis gracilis*. Clumping. Height 25 feet. Culms 1 ½". Hardy to 20 degrees. This is a smaller version of *B. textilis* with beautiful straight growth and tight clumping. Highly recommended.

*Bambusa tuldooides*. Clumping. Height 55 feet. Culms 2.3". Hardy to 21 degrees. Produces a large number of thick walled culms growing in a tight clump. Produces lots of branches low to the ground.

## Bamboo

*Bambusa tuldoidea* 'Ventricosa'. (Budda's Belly). Clumping. Height 55 feet. Culms 2.3 ". Hardy to 21 degrees. This variety becomes a dwarf with swollen internodes when grown in pots under dry conditions. In the ground it reverts to a giant with zigzag culms and branches. Not recommended for in ground culture.

*Bambusa vulgaris* (Common Bamboo). Clumping. Height 50 feet. Culms 4". Hardy to 30 degrees. Common throughout the tropical world. Open clump, culms spaced a foot or two apart.

\**Bambusa vulgaris* 'Vittata' (Hawaiian Gold). Clumping. Height 50 feet. Culms 4". Hardy to 30 degrees. Golden yellow culms with green vertical stripes that look painted on. Very popular ornamental. Loose clumping.

\**Bambusa vulgaris* 'Wamin'. Clumping. Height 16 feet. Culms 3". Hardy to 30 degrees. A dwarf form with short and swollen lower green internodes. Loose clumping.

*Dendrocalamus asper*. Clumping. Height 80 feet. Culms 8". Hardy to 25 degrees, recovers quickly after a freeze. Cultivated in Java for edible shoots and construction timber, this is one of the largest bamboos grown in the United States. Culms are strong, durable and generally straight. The immense shooting culms are covered in silver-brown velvety fuzz.

*Dendrocalamus asper* cv. *Hitam*. Clumping. Height 80 feet. Culms 8". Hardy to 25 degrees. World's largest known black bamboo. Rare and expensive.

*Dendrocalamus brandisii*. Clumping. Height 80 feet. Culms 8". Hardy to 28 degrees. Native to India, it is grown widely in Southeast Asia for its sweet edible shoots and its extremely hard wood. Because of its thick walls, it is used for house construction, farm equipment, furniture, etc. Established clumps will come back quickly even after a hard freeze.

*Dendrocalamus hamiltonii*. Clumping. Height up to 65 feet. Culms 5-6". Cold hardy to 27 degrees. From the North East Himalayas. Red color around each node. Leaves up to 15 inches long.

*Dendrocalamus latiflorus* 'Mei-Nung'. Clumping. Height 65 feet. Culms 6". Hardy to 25 degrees. From Southern China/Taiwan. Beautiful light green culms striped with dark green.

\**Dendrocalamus minor* 'Amenus'. Clumping. Height 25-30 feet. Culms 2.5". Cold hardy to 25 degrees. Pale yellow culms with light green stripes. Handsome garden specimen. Culm tops bend and droop.

*Dendrocalamus strictus*. Clumping. Height 60 feet. Culms 5". Hardy to 30 degrees. This is the most common bamboo in India. Used mainly for pulp. Culms not very straight, often small and sometimes solid. Flowers frequently.

*Gigantochloa apus*. Clumping. Height up to 65 feet. Culms 4". Hardy to 27 degrees. Common in Java, not found anywhere in the wild. Used for many purposes. It has large leaves and young culms are hairy.

*Gigantochloa atrovioleacea* (Tropical Black Bamboo). Clumping. Height 50 feet. Culms 4". Hardy to 27 degrees. As the culms mature, they turn black and display irregular green vertical stripes. Commonly used for furniture and for edible shoots. Will recover rapidly from a freeze.

*Guadua angustifolia* 'Bicolor'. Clumping. Height up to 100 feet. Culms up to 8". Hardy to 30 degrees. Culms have vertical yellow and green stripes. Very large variety with very open clumps and a lot of thorns.

*Guadua angustifolia* 'Less Thorny'. Clumping. Height up to 100 feet. Culms up to 8". Hardy to 30 degrees. The largest of the American bamboos, native to Venezuela and Peru, used for house construction and furniture. This is a clone with significantly fewer and smaller thorns.

*Guadua velutina*. Clumping. Height 50 feet. Culms 4". Hardy to 28 degrees. Culms thick walled but not solid. Erect. New shoots have beautiful maroon culm sheaths, which cling tightly to the lower internodes.

## Bamboo

*Otatea acuminata* ssp. *aztecorum* (Mexican Weeping Bamboo). Clumping. Height 20 feet. Culms 1.5". Hardy to 22 degrees. The long narrow leaves are produced in such abundance that they almost completely obscure the culms. Does not like wet conditions.

*Phyllostachys vivax*. Running (not currently stocked-- only in collection). Height up to 70 feet. Culms 5". Hardy to -5 degrees. Straight gray-green culms with a white powdery band under each node at sheath-fall. Fairly thick walled culms.

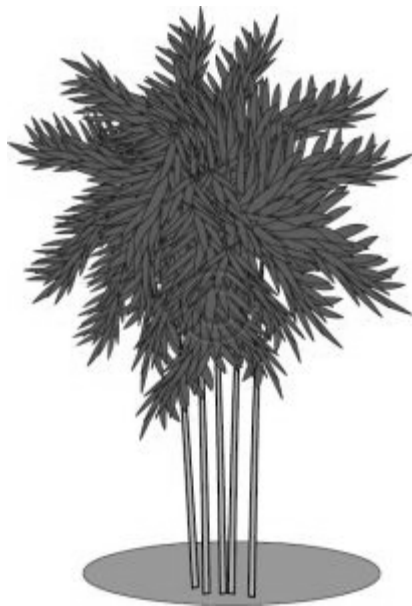
### For more information about Bamboo:

The website for the American Bamboo Society has lots of good information about bamboo: [www.americanbamboo.org](http://www.americanbamboo.org)

The Florida-Caribbean branch of the ABS also has their own website: <http://www.tropicalbamboo.org/>

ECHO's bookstore has some publications of interest: Building with Bamboo by Jules J. A. Janssen (1995) shows how bamboo has been used in different designs in developing countries and describes the varying properties and uses of different types of bamboo. \$17.50. We also carry Bamboos by Christine Recht and Max. F. Wetterwald (1992), a colorful and informative book., with more of a guide for the home gardener on bamboo. Another recommended book is The Book of Bamboo by David Farrelly (regrettably, we do not carry this title in our bookstore, but it is available through Amazon.com, and other online bookstores). Published by the Sierra Club (1984, revised 1995) it is the complete compendium of information about bamboo. Very good resource about bamboo. We use it often as a reference book in our library.

The American Bamboo Society also runs a small volunteer-run bookstore for bamboo lovers. See their website for more information.



## 7. Tropical and Subtropical Fruit Tree Ripening Chart

**Table 5** Ripening dates for tropical and subtropical fruits other than citrus, mangos or avocados. For the ripening dates of citrus cultivars, see page 16, for mango varieties see page 25 and for avocado varieties see page 3. Dark squares indicate the heaviest season, light squares indicate a lighter second crop or a lighter part of the season.

<b>Fruit Name</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Akee												
Ambarella												
Apple												
Atemoya												
Banana												
Barbados Cherry												
Bignay												
Blackberry												
Black Sapote												
Blueberry												
Cacao												
Caimito												
Canistel												
Carambola												
Carissa												
Cashew												
Cattley Guava												
Cherimoya												
Cherry of the Rio Grande												
Coconut												
Custard Apple												
Fig												
Granadilla												
Grumichama												
Guava												
Ice Cream Bean												
Illama												
Imbe												
Indian Jujube												
Jaboticaba												
Jackfruit												
Jelly Palm												
Kei Apple												
Kwai Muk												
Longan												
Loquat												
Lychee												
Macadamia												
Madagascar Plum												
Malabar Chestnut												
Malay Apple												
Mamey Sapote												

## Fruit Ripening Chart

Fruit Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mango												
Mayan Breadnut												
Miracle Fruit												
Mombin												
Monstera												
Mulberry												
Muscadine Grape												
Neem												
Otaheite Gooseberry												
Papaya												
Passionfruit (purple)												
Peaches/nectarines												
Peanut Butter Fruit												
Persimmon												
Pineapple												
Pitomba												
Plum, Japanese												
Pomegranate												
Prickly Pear Cactus												
Rose Apple												
Santol												
Sapodilla												
Soursop												
Spanish Lime												
Strawberry Tree												
Sugar Apple												
Surinam Cherry												
Tamarind												
Wampi												
Wax Jambu												
White Sapote												

## 8. Estimated Fruit Yields

**Table 6** Estimated yields in pounds per tree for selected tropical fruit crops under South Florida conditions, for mature trees.

<b>Fruit Crop</b>	<b>Avg. Yld. (Lbs/Tree)</b>	<b>Fruit Crop</b>	<b>Avg. Yld. (Lbs/Tree)</b>	<b>Fruit Crop</b>	<b>Avg. Yld. (Lbs/Tree)</b>	<b>Fruit Crop</b>	<b>Avg. Yld. (Lbs/Tree)</b>
akee	100-150	carambola	200-350	longan	50-250	persian lime	450-600
atemoya	25-70	coconut	35-50	lychee	100-200	persimmon	50-75
avocado	150-160	custard apple	30-70	macadamia	15-35	pummelo	150-300
banana	20-50	guava	120-220	mamey sapote	100-250	sapodilla	50-200
barbados cherry	75-100	jackfruit	150-300	mango	200-300	sugar apple	25-50
black sapote	70-200	key lime	70-100	monstera	3-6	wax jambu	100-200
canistel	50-200	kumquat	40-50	papaya	30-100	white sapote	100-275

From data compile by Dr. J.H. Crane and Dr. C.F. Balerdi at University of Florida.

## 9. Tree Planting Suggestions

After many years of selling trees and providing verbal instructions for their care at planting, we have finally decided to put into writing ECHO's method for planting fruit trees. This method is successful for us and may be helpful for those inexperienced at planting fruit trees in Southwest Florida.

### General Suggestions

Moving a tree from a nursery environment to another location can add stress to a potted plant. In our nursery, potted trees are watered once, sometimes twice a day. If you are not going to plant a tree immediately, keep in mind that a potted plant has a small reservoir from which to draw water and will need to be monitored closely for water stress. The nursery medium should be completely moistened at each watering.

We suggest planting the tree most days of the year in the morning (before 10:00 am) or late in the afternoon (after 4:00 pm) in order to avoid stressing the tree by planting in the heat of the day.

Choosing a location: this can be difficult. There are numerous considerations, including the tree's cold tolerance, flood tolerance (e.g. avocado and papaya do not tolerate flooding) and height and width at maturity.

We do not put any fertilizer in the planting hole. Many people like to amend their planting holes. We have had fine success without adding amendments, aside from maybe mixing with the sand some fine textured soil or composted manure in the top few inches, and topping with 2-3" of wood chip mulch. We do not recommend fertilizing the tree for until 4-6 weeks after planting.

### Tree Planting Instructions:

- 1) Place tree to be selected at the planting site, having handy a shovel and a hose, preferably one with a high-pressure nozzle on the end.
- 2) Water tree's rootball, either while in the pot, or immediately after removing pot (see Step 5), whichever is easier.
- 3) Dig a hole 1½ - 2 times the diameter of the pot, to the proper depth. If planting in a low area, mound flood sensitive trees such as citrus or avocado - the tree may actually "sit" several inches above ground level. We mound many of our fruit trees at ECHO due to the high water table and seasonal flooding. Create a generous mound, or "turtle-back" made of sand - not compost or other organic matter, which will quickly break down.
- 4) Fill the planting hole with water.
- 5) Set nursery tree on its side and remove pot. Check for circling roots in the bottom half of the root ball, gently tease larger roots free (there are often 3 or more noticeably larger and longer roots in lower half of the root ball); gently pull on some of the smaller, tangled fibrous roots around the root ball by poking your finger into root ball up to the second knuckle and forming a "hook" to tease out the roots. Position roots in proper direction, and place tree in hole.

## Estimated Fruit Yields

- 6) Backfill hole with original soil, using high water pressure to remove air pockets by pushing hose nozzle into the soil around the root ball - the soil should be thoroughly saturated at planting.
- 7) If desired, place a circle of mulch around tree 2-3" thick, keeping mulch at least 6" from the base of tree.
- 8) Water tree as needed in the days to come. A finger test, feeling for soil moisture a few inches down, is usually the best test. The soil should always be at least slightly moist. A general rule of thumb is to water 3 times/week for the first two weeks, followed by 2 times /week thereafter. The spring months (March-June) are especially difficult for trees along with dry spells during summer and fall months. Monitor soil moisture closely during these months.

## 10. Pruning Fruit Trees

General considerations: for most of the fruit trees that we carry the general rule of thumb is that the best time to prune is right after the tree has finished producing fruit. Always remove cross-branches, dead limbs and potentially hazardous limbs.

Note: for trees that bear fruit on terminals (for example mangos, lychees and longans) – the more terminals you have, the more fruit.

### Atemoya

During first two or three years after planting, prune to form a strong frame and to control excessively long shoots, then only light pruning is needed after that. A March pruning is recommended as trees age for further shaping and control. A June pruning will result in additional flowering and fruit development. Prune long terminal branches back to 5 or 6 nodes and remove the last two leaves closest to the pruning cut.

### Barbados Cherry

Mature plants will bear better if thinned out by judicious pruning after the late crop and then fertilized once more.

### Black Sapote

The tree is naturally vigorous and receives little or no cultural attention in Florida.

### Blueberry

See the IFAS fact sheet (available on-line or through your county extension office) for specific information on pruning blueberries.

### Canistel

Outstanding branches should be pruned back to avoid wind damage and shape the crown.

### Cherimoya

Pruning to eliminate low branches, providing a clean trunk up to 32 in (80 cm), to improve form, and open up to sunlight and pest control, is done preferably during dormancy. See "Atemoya" for more information about pruning annonas.

### Citrus

Generally does not need much pruning or training. Prune back highly vigorous shoots to maintain uniform shape and keep the center of the tree open. It is best to prune just before bloom or just after fruit set, then the tree naturally adjusts fruit set during bloom or June drop. Avoid pruning during late summer/early fall - this can stimulate vigorous tender growth that is cold sensitive. In hot summer areas, late summer pruning can cause citrus bark and fruit to become exposed to too much sunlight and cause sunburn.

### Fig

Fig trees are cut back severely in fall or winter, depending on whether the crop is desired the following summer or fall. A severe winter pruning can reduce rust problems by invigorating the next season's growth. Branches are often notched to induce lateral branching and increase the yield.

### Guava

Light pruning is always recommended to develop a strong framework, and suckers should also be eliminated around the base. Fruits are borne by new shoots from mature wood. If trees bear too heavily, the branches may break. Therefore, thinning is recommended and results in larger fruits. Guava trees grow rapidly and fruit in 2 to 4 years from seed. They live 30 to 40 years but productivity declines after the 15th year. Orchards may be rejuvenated by drastic pruning.

## **Pruning Fruit Trees**

### Jaboticaba

Reducing the number of fruits has the effect of increasing the size of those that remain.

### Japanese persimmon

Young trees are pruned back to 2 1/2 ft to 3 ft (.74-.91 m) when planted and later the new shoots are thinned with a view to forming a well-shaped tree. Some cultivars tend to develop a willowy growth and require cutting back occasionally to avoid the development of weak branches which break when heavy with fruit. Annual pruning during the first 4 to 5 winters is desirable in some cultivars. If a tree tends to overbear and shows signs of decline, it should be drastically cut back to give it a fresh start.

### Jackfruit

After harvesting, the fruiting twigs may be cut back to the trunk or branch to induce flowering the next season.

### Indian jujube

Pruning should be done during the first year of growth to reduce the plant to one healthy shoot, and branches lower than 30 in (75 cm) should be removed. At the end of the year, the plant is topped. During the 2nd and 3rd years, the tree is carefully shaped. Thereafter, the tree should be pruned immediately after harvesting at the beginning of dormancy and 25 to 50% of the previous year's growth may be removed. Sometimes a second lighter pruning is performed just before flowering. There will be great improvement in size, quality and number of fruits the following season.

### Longan

See "Lychee" for details.

### Loquat

Thinning of flowers and young fruits in the cluster, or the clipping off of the tip of the cluster, or of entire clusters of flowers and fruits, is sometimes done to enhance fruit size. This is carefully done by hand in Japan

### Lychee

Ordinarily, the tree is not pruned after the judicious shaping of the young plant, because the clipping off of a branch tip with each cluster of fruits is sufficient to promote new growth for the next crop. Severe pruning of old trees may be done to increase fruit size and yield for at least a few years. The Indian farmer may girdle the branches or trunk of his lychee trees in September to enhance flowering and fruiting. Tests on 'Brewster' in Hawaii confirmed the much higher yield obtained from branches girdled in September. Girdling of trees that begin to flush in October and November is ineffective. Similar trials in Florida showed increased yield of trees that had poor crops the previous year, but there was no significant increase in trees that had been heavy bearers. Furthermore, many branches were weakened or killed by girdling. Repeated girdling as a regular practice would probably seriously interfere with overall growth and productivity. Indian horticulturists warn that girdling in alternate years, or girdling just half of the tree, may be preferable to annual girdling and that, in any case, heavy fertilization and irrigation should precede girdling.

### Mango

About 6 weeks before transplanting either a seedling or a grafted tree, the taproot should be cut back to about 12 in (30 cm). This encourages feeder-root development in the field. Usually no pruning is done until the 4th year, and then only to improve the form and this is done right after the fruiting season. If topping is practiced, the trees are cut at 14 ft (4.25 m) to facilitate both spraying and harvesting. Grafted mangos may set fruit within a year or two from planting. The trees are then too weak to bear a full crop and the fruits should be thinned or completely removed.

### Papaya

Plants that have become too tall are cut to the ground and side shoots are allowed to grow and bear. After the 3rd year of bearing, the main stem is cut off about 3 ft (1 m) from the ground at the beginning of winter and is covered with a plastic bag to protect it from rain and subsequent rotting. Several side shoots will emerge within a few days. When these reach 8 in to 1 ft (20-30 cm) in height, all are cut off except the most vigorous one which replaces the original top.

### Passionfruit

Root-pruning should precede transplanting of seedlings by 2 weeks. After a vine of either the yellow or purple passionfruit attains 2 years of age, pruning once a year will stimulate new growth and consequently more flower and fruit production.

## Pruning Fruit Trees

### Pomegranate

Initially, the plants are cut back to 24 to 30 in (60-75 cm) in height and after they branch out the lower branches are pruned to provide a clear main stem. Inasmuch as fruits are borne only at the tips of new growth, it is recommended that, for the first 3 years, the branches be judiciously shortened annually to encourage the maximum number of new shoots on all sides, prevent straggly development, and achieve a strong, well-framed plant. After the 3<sup>rd</sup> year, only suckers and dead branches are removed.

### Roselle

If intended solely for the production of calyces, the ideal planting time in southern Florida is mid-May. Blooming will occur in September and October and calyces will be ready to harvest in November and December. Harvesting causes latent buds to develop and extends the flowering life of the plant to late February. When the fruit is not gathered but left to mature, the plants will die in January. Early pruning will increase branching and development of more flowering shoots.

### Sugar apple

Judicious pruning to improve shape and strength of tree must be done only in spring when the sap is rising, otherwise pruning may kill the tree. See “Atemoya” for more details of annona pruning.

### Surinam cherry

They are most productive if un-pruned, but still produce a great many fruits when close-clipped in hedges.

### White Sapote

In California, the young trees are cut back to 3 ft (0.9 m) when planted out, in order to encourage low-branching. As the branches elongate, some pruning is done to induce lateral growth.

## 11. Guide to Choosing Fruit Trees or Tropical Vegetables for Cold Tolerance

Probably the main limitation to growing tropical fruits in Southwestern Florida is low temperatures. The following are what we hope are helpful charts to aid you in choosing fruit trees for your yard. They indicate the temperature minima of the various tropical fruit trees that ECHO carries. In using the charts below, please remember that these are simply our own suggestions, with the information gleaned from a variety of sources and not the ultimate authority on the matter. You may find different trends in your own area. Microclimates within your yard may raise the temperature several degrees above reported temperatures; check the temperature trends in several locations in your own yard. For example, depressions, or areas facing north may be quite a bit cooler, while areas next to walls, south-facing or mature landscapes protected from the wind may be several degrees warmer. Another thing to keep in mind is that these minima refer to sustained temperatures; if a low temperature is maintained for only an hour, that is a very different thing than a low temperature sustained for several hours. And keep in mind that younger trees are generally 3-4°F more sensitive than mature trees.

Many people are determined to grow tender fruit trees in colder locations. There are options if you decide to go this route. You can cover younger trees during the cold nights. Many of these trees can be grown in moveable containers that can be brought indoors or to a protected location for the cold snaps. If you are willing to engage in heroics, there are publications available through IFAS detailing other measures that can be taken to protect fruit trees from the cold. At ECHO we rely both on overhead sprinklers and “frost blankets” to protect plants during frost and freeze conditions.

## Cold Tolerance

**Table 7** Cold Tolerance of ECHO's tropical fruit trees.

Hardy Below 24°F	24°F Minimum	26°F Minimum	29°F Minimum		Not at all Hardy
Apple	Anise	Akee	Ambarella	Otaheite	Coffee
Blackberry	Bay Leaf	Allspice	Annato	Gooseberry	Spanish Lime
Blueberry	Cattley Guava	Atemoya	Banana	Papaya	Malay Apple
Cherry of the R. Grande	Indian Jujube	Bay Rum	Barbados Cherry	Peach Palm	Miracle Fruit
Fig	Jaboticaba	Carissa	Black Sapote	Pitomba	Spanish Lime
Jelly Palm	Kei Apple	Cherimoya	Caimito	Purple Passion Fruit	Cashew
Kumquat	Macadamia Nut	Curry Leaf Tree	Carambola	Sapodilla	
Loquat	Surinam Cherry	Grumichama	Cinnamon	Soursop	
Mulberry	White Sapote	Imbe	Coconut	Wax Jambu	
Muscadine Grape		Lychee	Custard Apple	Pineapple	
Nectarine		Raspberry,	Guava (Tropical)	Malabar Chestnut	
Peach		Mysore	Jackfruit	Sugar Apple	
Pear		Wampi	Kwai Muk	Rose Apple	
Persimmon		Longan	Mamey Sapote	Canistel	
Pineapple Guava			Mango	Ice Cream Bean	
Pomegranate			Mayan Breadnut	Tamarind	
Prickly Pear			Monstera		

**Table 8** Avocado cultivar cold tolerance

Avocado Cultivar	Minimum Temperature (°F)
Brogdon	22
Winter Mexican	22
Custer's Red	24
Day	25
Marcus Pumpkin	25
Lula	25
Choquette	26
Tonnage	26
Russell	32

**Table 9** Citrus Species cold tolerance

Citrus Species	Minimum Temperature (°F)
Kumquat	10
Calamondin	10
Satsuma Mandarin	15
Sweet Orange	24
Grapefruit	
Pummelo (Hirado Butan)	
Lemon (Meyer)	
Lime	29

Information in above tables adapted from *Florida Fruit* by Lewis Maxwell and *Rare and Exotic Tropical Fruit Trees and Palms*, by Carl W. Campbell and Seymour Goldweber, published by the Caloosa Rare Fruit Exchange; and *A guide for choosing rare fruit trees for your yard* by David and Tina Silber, published by the California Rare Fruit Growers, Inc. and our own observations and experience. . Most cold hardy **sweet oranges**: Ambersweet, Parson Brown, Hamlin. Most cold hardy **mandarins / tangerines**: Dancy, Orlando, Dancy, Robinson, Sunburst.

## 12. Drought Tolerance of Tropical Fruit Trees

In Southwest Florida, water stress symptoms on trees are especially apparent during the months of April, May and early June. This is due to the low cloud cover, hot and dry winds and little or no rainfall during these months, which can contribute to desiccation and put a lot of stress on a tree. If you are concerned about water usage in your yard, you may wish to consult this table in determining what trees to plant. Trees with good drought tolerance and moderate drought tolerance will be easier to establish and maintain in your landscape. Trees with poor drought tolerance will require close monitoring and frequent watering. Water stress, if it is not severe enough to kill the tree, can certainly delay fruiting, stunt growth and contribute to overall poor health. All trees, but especially those with low or no drought tolerance should be monitored during the dry season for water stress.

## Drought Tolerance of Tropical Fruit Trees

**Table 10** Drought tolerance of ECHO's tropical fruit trees. Information from *Florida Fruit* by Lewis Maxwell and *Rare and Exotic Tropical Fruit Trees and Palms*, by Carl W. Campbell and Seymour Goldweber, published by the Caloosa Rare Fruit Exchange; and our own observations and experience.

Good	Moderate		Poor		None
Ambarella	Akee	Longan	Apple	Persian Lime	Cacao
Cashew	Atemoya	Lychee	Banana	Pineapple	
Fig	Avocado	Macadamia Nut	Calamondin	Pitomba	
Imbe	Barbados Cherry	Mamey Sapote	Carambola	Pummelo	
Indian Jujube	Bignay	Mulberry	Cattley Guava	Sweet Orange	
Jelly Palm	Black Sapote	Muscadine Grape	Coffee	Tangelo	
Loquat	Blackberry	Oriental Persimmon	Grapefruit	Tangor	
Mango	Caimito	Otaheite Gooseberry	Grumichama	Wax Jambu	
Mayan Breadnut	Canistel	Peach Palm	Jaboticaba		
Pineapple Guava	Carissa	Rheedia aristata	Jackfruit		
Pomegranate	Cherimoya	Rose Apple	Key Lime		
Prickly Pear Cactus	Cherry of the Rio Grande	Roselle	Kumquat		
Purple Mombin	Coconut	Soursop	Lemon		
Sapodilla	Custard Apple	Strawberry Tree	Miracle Fruit		
Spanish Lime	Guava	Sugar Apple	Monstera		
Tamarind	Illama	Surinam Cherry	Mysore Raspberry		
	Java Plum	Tangerine/Mandarin	Papaya		
	Kei Apple	Wampi	Passion Fruit		
	Kwai Muk	White Sapote	Peach		

## 13. Flood Tolerance of Tropical Fruit Trees

Southwest Florida's landscape is of the "flatwood" type. The lack of any sloping in the land means that water does not have anywhere to run off too during the summer rains, bringing the water table up and often above the soil surface. Tree roots require not only water and minerals, but also air— the roots need to "breathe" just as much as the leaves do. This causes root growth to become very restricted – for example, 99% of a mature citrus tree's roots are in the top two feet of soil in flatwood landscapes. The high summer water table can kill trees if they are not flood tolerant. If you live an area that is prone to flooding during our rainy season, you may find the following chart helpful in choosing a tree for your yard. However, don't feel too restricted by this; with a little extra work you can also protect your trees from high water by planting on "turtle backs". The principle involved is simple: build a mound upon which to plant. This will raise the roots of the tree out of the high summer water table. One important key in building a turtle back is that the mound should not be constructed using organic matter (for example mulch or compostable material) as the primary component. The organic matter would quickly break down in our climate, and would subsequently lower the mound – possibly enough to bring the trees roots into the water table and drowning the tree. For us, the primary material in South Florida is sand, and this is what we construct our turtle backs out of. If you would like to see an example of planting on a turtle back, please visit ECHO's Tropical Fruit Tree Arboretum. One caution is that you should avoid making the mound too high – then you run into the same types of problems that you might have growing a tree in a container (the tree becomes "root-bound" and the mound will not hold moisture very well, necessitating more frequent watering).

## Flood Tolerance of Tropical Fruit Trees

**Table 11 Flood Tolerance of Tropical Fruit Trees.** Information from *Florida Fruit* by Lewis Maxwell and *Rare and Exotic Tropical Fruit Trees and Palms*, by Carl W. Campbell and Seymour Goldweber, published by the Caloosa Rare Fruit Exchange; and our own observations and experience.

Good	Moderate	Poor		None
Guava	Banana	Akee	Monstera	Atemoya
	Black Sapote	Ambarella	Muscadine Grapes	Avocado
	Caimito	Apple	Otaheite Gooseberry	Cacao
	Canistel	Barbados Cherry	Peach	Coffee
	Carambola	Bignay	Pineapple	Lemon
	Cashew	Carissa	Pineapple Guava	Mamey Sapote
	Cherry of the Rio Grande	Cattley Guava	Pitomba	Mysore Raspberry
	Citrus*	Cherimoya	Pomegranate	Papaya
	Coconut	Custard Apple	Prickly pear	Passion Fruit
	Indian Jujube	Fig	Red Mombin	Sugar Apple
	Java Plum	Grumichama	Roselle	Wampi
	Lychee	Illama	Soursop	
	Macadamia Nut	Imbe	Spanish Lime	
	Mango	Jaboticaba	Strawberry Tree	
	Mulberry	Jackfruit	Tamarind	
	Oriental Persimmon	Jelly palm	White Sapote	
	Rose Apple	Kei Apple		
	Sapodilla	Kwai Muk		
	Surinam Cherry	Longan		
	Tangerine/Mandarin	Loquat		
	Wax Jambu	Miracle Fruit		

\*Please note that the citrus trees that we sell in our nursery are grafted onto flood tolerant rootstock. In fact, there are many properties of citrus trees that are rootstock-dependent. The rootstocks on the trees that we sell are Volkemer (for lemons and limes) and Swingle (for everything else). These rootstocks are particularly well-suited to the soils and conditions in SW Florida, so people residing on the east coast of Florida should purchase citrus from nurseries on that coast. As an example, Swingle rootstock does poorly on alkaline soil, common to the limestone soils on the east coast.

## 14. Saline Soils

For many residents of Southern Florida, especially those living in the coastal areas, or irrigating with well water with high salt content, soil salinity (high amounts of salts in the soil) can really limit home fruit tree growth. Soil salinity can result from a number of different causes, both natural as well as resulting from human activity. Salts (including your common table salt) occur naturally in soils, and are present in all water, except rainwater. Salts build up naturally in soil. Water evaporation, heavy irrigation and chemical fertilizers can increase soil salinity. As well, in the coastal areas of Florida, near the Gulf or the Atlantic, the salt spray can wreak havoc on plant leaves.

Salts in soils cause problems by inhibiting the growth of most plants, and killing many. The salts render less water available to plants, because the salt ions attract water. The most common symptoms of this are leaf burn and drought stress (even if the plant is well-watered). Often chlorosis (yellowing of the leaves) is another common symptom.

**Managing your saline soil** The addition of organic matter (compost, mulch, manure, etc...) will aid in improving your soil over time by providing a buffering effect. It may take a few years to see the results (especially in the sandy soils of South Florida) but it should be worth the effort. Try not to over-fertilize, as that can contribute to the problem. Irrigate regularly, but take care not to over-irrigate. Planting on ridges helps as well.

**Living with your saline soil** Try to select trees and plants that are salt-tolerant. This will have the additional benefit of improving your soil and the environment over time as well. In **Figure 10**, you will find a selection plants and trees we carry that will tolerate saline soil. If the following plants do not strike your fancy, and if you are not primarily concerned with growing edible plants, remember that there is a wealth of plants native to Florida that are extremely well-suited to our climate and soil conditions. Although we cannot help you in the selection of Florida native plants, there are books

## Saline Soils

and publications available in your local library, from your county extension agency, and in ECHO's bookstore on selecting and growing native Florida plants. As well, there are nurseries that specialize in native plants. These also have the added benefit of requiring much less water.

**Table 12** Salt tolerance of different fruiting trees Information adapted from *Rare and Exotic Tropical Fruits: Trees and Plants*, Carl W. Campbell, Seymour Goldweber, Caloosa Rare Fruit Exchange, 1985 and *Florida Fruit*, Lewis S. Maxwell and Betty M. Maxwell, 1995.

Good	Moderate	Fair	Poor
Carissa (Natal Plum) Coconut Tamarind	Akee Bignay Black Sapote Canistel (Egg Fruit) Cattley (Strawberry) Guava Fig Governor's Plum Guava Imbe Indian Jujube Jackfruit Jelly Palm Key Lime Loquat Mayan Breadnut Monstera Pineapple Guava Pomegranate Prickly Pear Pummelo Purple Mombin Rose Apple Sapodilla Spanish Lime Tangerine/Mandarin Wax Jambu	Apple Atemoya Barbados Cherry (Acerola) Cacao (Cocoa) Cherimoya Cherry of the Rio Grande Citrus (rootstock dependent) Coffee Custard Apple Grumichama Illama Imbe Kei Apple Kumquat Kwai Muk Mamey Sapote Miracle Fruit Mulberry Otaheite Gooseberry Persimmon Pineapple Pitomba Roselle Soursop Sugar Apple Surinam Cherry Wampi White Sapote	Ambarella Avocado Banana Blueberry Caimito (Star Apple) Carambola Cashew Jaboticaba Longan Lychee Lychee Macadamia Mango Muscadine Grape Nectarine Papaya Passion Fruit Peach Pear Plantain Raspberry Strawberry Tree

**Table 13** List of salt-tolerant fruit trees, tropical vegetables and multipurpose trees that perform well on the high pH, and very salty soil on La Gonave island in Haiti.

Common Name	Scientific Name	Notes
Barbados Cherry	<i>Malpighia glabra</i>	somewhat salt tolerant
Canistel	<i>Pouteria campechiana</i>	tolerates poor soil (may even fruit better on thin soils)
Chaya	<i>Cnidococcus chayamansa</i>	resistant to the hot humid weather of Florida summer and to extreme dry weather
Coconut	<i>Cocos nucifera</i>	grows on sandy beaches, flooded marshes, very salt tolerant, salt spray tolerant
Cranberry Hibiscus	<i>Hibiscus acetosella</i>	does well in sandy soil
Date Palm		

## Saline Soils

Common Name	Scientific Name	Notes
Dune Sunflower		salt spray resistant
Fig	<i>Ficus carica</i>	moderately tolerant
Guava	<i>Psidium guajava</i>	can be grown successfully in wet and moderately saline soils
Imbe	<i>Garcinia livingstoneii</i>	drought tolerant
Indian Jujube	<i>Ziziphus mauritania</i>	mild-high salinity, frost hardy and drought tolerant; can be planted on sand dunes
Key Lime	<i>Citrus aurantifolia</i>	very cold sensitive
Moringa	<i>Moringa oleifera</i>	drought hardy
Neem	<i>Azadirachta indica</i>	very hardy on poor soil
Papaya	<i>Carica papaya</i>	Surprisingly, papaya does well there, though papaya is considered salt-intolerant
Prickly Pear	<i>Opuntia spp.</i>	well adapted to coastal areas where salt and pH are typically high
Sapodilla	<i>Manilkara zapota</i>	can irrigate with brackish water on sandy soils
Sour Orange		
Spanish Lime		
Tamarind	<i>Tamarindus indica</i>	very salt tolerant, and can withstand salt spray

## 15. A Guide To Edible Landscaping Your Yard

Many people visit ECHO's nursery with a specific need, looking for an unusual fruit tree or tropical vegetable to fit that need. We have compiled this list to make it easier to choose from the many trees, shrubs and vines that we carry. This way you can choose an edible plant for a specific purpose in your yard

### Conversation Piece

Pummelo  
Miracle Fruit  
Akee  
Jaboticaba  
Jackfruit  
Neem

### Exotic Juice

Guava  
Passion fruit

### Heavy Bearers

Carambola  
Most citrus  
Mango

### Skirting of House Trailer

Galangal  
Lemongrass  
Vetiver Grass

### Visual Barrier, but not a hedge

Loquat  
Bamboo

### Edible Hedges

Cattley Guava  
Surinam Cherry

### Quick Producers

Banana  
Passion Fruit  
Papaya  
Carambola

### Summer Herbs

Rosemary  
Oregano  
African Tree Basil

### Edible Security Hedge

(warning: thorns!)  
Limeberry  
Key Lime  
Meyer Lemon  
Kei Apple  
Carissa (Natal Plum)  
Rheedia aristata (sharp, pointy leaves)

### Winter Bearers (for Snowbirds)

Citrus  
Loquat

## A Guide to Edible Landscaping Your Yard

Carambola  
Papaya  
Black Sapote  
Avocado (late-season cultivar)

### Extended, or multiple seasons

Strawberry Tree  
Passion Fruit  
Carambola  
Lemons/Limes  
Grapefruit  
Miracle Fruit  
Papaya

### Colorful Plants

Citrus with brightly colored fruit (e.g. Page,  
Calamondin, Sunburst)  
Persimmon (bright orange fruit)  
Nasturtium (bright edible flowers)  
Cranberry Hibiscus (purple leaves)  
Roselle (purple blossoms)  
Caimito (underside of leaves bronze)  
Purple Passion Fruit (unique purple blossoms)  
Beaumont Macadamia Nut (showy pink  
blossoms)  
Alphonse Karr Bamboo (yellow-striped culms)

### Moist Soil Tolerance

Banana  
Guava  
Xanthosoma/Colacacea (Elephant Ears)  
Belembe  
Katuk

### Perennial Vegetables/Edible Leaves

Chaya  
Cranberry Hibiscus  
Edible Hibiscus  
Katuk  
Moringa  
Basket Vine  
Belembe  
Okinawa Spinach

### Shade Trees

Grapefruit  
Indian Jujube  
Rose Apple  
Neem  
Curry Leaf Tree  
Longan  
Mango

### Will produce in shady area

Pineapple  
Monstera  
Carambola  
Cocoyam  
Jaboticaba

### Spice Trees

Allspice  
Bay Leaf  
Bay Rum  
Cinnamon

### Milk Shake/Sherbet Potential

Atemoya  
Peanut Butter Fruit  
Persimmon (when fully ripe)  
Soursop  
Sugar Apple  
Canistel  
Banana  
Avocado

### Attractive Blossoms

Apple (white)  
Barbados (pink)

### Attractive Evergreen Trees

Black Sapote (dark green canopy)  
Jackfruit  
Pitomba  
Sapodilla  
Lychee  
Longan  
Curry Leaf  
Neem

### Pest-free maintenance (or nearly so)

Black Sapote  
Canistel  
Lychee  
Longan  
Moringa  
Jaboticaba

### Shrubby Trees

Barbados Cherry  
Grumichama  
Otaheite Gooseberry  
Cattley Guava  
Sugar Apple  
Pitomba  
Surinam Cherry  
Australian Beach Cherry

## 16. Suggested Resources for More Information

The following are a selection of various resources that may be helpful. Included are references for tropical fruits, citrus, mangos, grafting, growing unusual and exotic vegetables, general gardening and landscaping in Florida, cookbooks, a video series on tropical fruits, locations of other tropical fruit gardens you can visit as well as some helpful web resources. We have also included details on where the materials can be found. Many of these publications are available in ECHO's bookstore.

### TROPICAL FRUITS

**Florida's Best Fruiting Plants** \$19.95 ECHO Bookstore

*Charles R. Boning, 2006*

This beautiful color picture book provides details of 80 species of native and exotic trees, vines and shrubs, as well as covering hundreds of relatives. It contains plant descriptions, salt and cold tolerances, fruiting times, cultural practices, propagation and more. This up to date book is now becoming one of our most commonly used reference books in the nursery.

**Florida Fruit** \$8.00 ECHO bookstore

*Lewis & Betty Maxwell, 1991*

This picture book (black & white photos) is a guide to the selection of choice fresh fruit that grow well in Florida. It contains plant descriptions, salt and cold tolerances, fruiting times, cultural practices, propagation and more. It is one of our most commonly used reference books in the nursery. 119 pages, paperback

**Fruits of Warm Climates** \$69.95 ECHO bookstore

*Dr. Julia Morton 1987*

This is the most used reference book at ECHO. The ultimate resource book for tropical fruit, it has photos and information about almost any tropical fruit: common names in other languages, details of cultivation and propagation, diseases, varieties, where it is grown, uses, and more. 504 pages, hard bound.

**Fruit of Warm Climates CD-ROM** \$49.95 ECHO bookstore

*Dr. Julia Morton 1987*

This classic 504 page reference book on tropical fruits will be out of print as soon as ECHO sells the remaining stock of about 300 books. But now it is available on CD-ROM. The book has entries for 124 fruits, giving extensive information on the more common ones. It also has listings of local and alternate names for many of the fruits.

**Rare and Exotic Tropical Fruit Trees and Plants** Caloosa Rare Fruit Exchange (3406 Palm Beach Boulevard, Fort Myers, FL 33905)

*Carl W. Campbell and Seymour Goldweber*

This compact little booklet is one of our more useful resources in the nursery. It is comprised of tables detailing the following information: scientific and common name, native area, type and size of the plant, a fruit description, season and uses of the fruit, growth description, wind resistance, salt, cold drought and flood tolerance, means of propagation and a few extra comments. We find this to be one of our most helpful and handy guides. 20 pages, paperback booklet.

**Tropical Fruits** Amazon.com

*H.Y. Nakasone, R.E. Paull*

Volume 7 in Crop Production Science in Horticulture. The book provides a broad survey of all aspects of tropical fruit production and usage. It details the climate and soils of the tropics, and outlines the general principles of cultivation and postharvest handling. Each type of fruit (about 25 in total) is examined in terms of botany, origin, distribution, ecology, genetics, cultivars, cultural practices, pests, diseases, harvest and utilization. Please note – that although this book is geared toward a commercial grower, our farm manager found it to be a very helpful resource. 444 page, hardcover.

**All About Citrus and Subtropical Fruits** Amazon.com

*Ortho Books 1985*

This book is for the gardener who wants to grow citrus and discover the unusual world of subtropical fruits. Learn how to grow and enjoy over 50 varieties of citrus and 16 exotic fruits, with tips in cultivating these plants indoors in colder climates. 96 pages, softcover.

## Other Resources

### CITRUS

**Citrus growing in Florida** \$29.95 ECHO bookstore

*L. Jackson, F. Davies, 1999*

This book tells about citrus growing, including production, climate, soils, propagation, planting, pests and diseases. 314 pages, hardcover.

**Your Florida Dooryard Citrus Guide** \$11.95 ECHO Bookstore

No matter where you live in Florida, you can grow your own citrus more easily than almost any other fruit tree. What it takes is a little tender loving care at the right time. "Your Florida Dooryard Citrus Guide," written for Florida homeowners as well as our winter visitors, tells you how to grow citrus in your dooryard landscape or as a container plant. 62 pages, paperback.

**Citrus : Complete Guide to Selecting & Growing More Than 100 Varieties for California, Arizona, Texas, the Gulf Coast and Florida** Amazon.com

*Lance Walheim 1996*

This beautiful book is not only a pleasure to read, but it is also worth buying for the magnificent pictures alone. In addition to the well-done photographs of the different and unusual citrus varieties that are available, it also contains hints about where to plant and how to care for your citrus, both in the dooryard, or in containers.

### MANGOS

**Guide to Mangos in Florida** \$29.95 ECHO bookstore

*Fairchild Tropical Garden 1992*

Page after page of full color photos! In addition to the color photo of the outside and inside of the fruit for each variety, the text discusses origin, tree size, fruit quality, shape, color, size, weight, skin, flesh, seed, and season. 226 pages, quality paperback.

### GRAFTING

**Grafting, Budding, Layering & Other Ways of Propagating Fruit Plants in Florida** \$5.00 ECHO bookstore

*Mike J. Young & T. E. Crocker*

This booklet explains techniques commonly used to propagate fruit plants, with special emphasis on Florida Fruits. 50 pages, paperback.

**Grafting Kits** \$13.95 ECHO Bookstore

Ideal for the beginner grafter, and for the experienced grafter too! Each kit contains information for grafting avocado, citrus and mangos, 10 replaceable blades, 1 knife handle, a 300 foot role of budding/grafting tape and about 50 grafting rubbers.

### PRUNING

**Pruning Trees, Shrubs & Vines** \$3.95, ECHO Bookstore

*Storey Country Wisdom Bulletin 1980*

This bulletin tells you how to keep your trees, shrubs, and vines attractive and healthy through careful pruning. 32 pages, paperback.

**Tree Pruning: A Worldwide Photo Guide** Amazon.com

*Alex L. Shigo 1989*

This unique book by a longtime researcher who has spent his life discovering the true nature of how trees function and the best ways to take care of them is fascinating and filled with interesting photographs. Based on solid science, this book destroys old myths of tree care that actually hurt trees and introduces the practices that homeowners and arborists must learn if we are to help trees survive. 186 pages, hardcover,

### VEGETABLES

**Florida Vegetables** \$8.00 ECHO Bookstore

*Lewis S. Maxwell, 1974*

This book contains the information needed to grow vegetables in the Florida home garden. This includes basic information on soil preparation, fertilization and pest control. Many photographs and planting guide are included. 118 pages, paperback.

## Other Resources

### **Vegetable Gardening in Florida** \$16.95 ECHO Bookstore

*James M. Stephens*, 1999

With full-cover photographs and detailed expert advice, this book describes how to grow abundant vegetables and edible herbs in gardens anywhere in Florida. The book addresses the challenges of pests and diseases and includes a detailed and illustrated description of all the major and minor crops usually grown in Florida. 135 pages, paperback

## **FLORIDA LANDSCAPING**

### **Your Florida Landscape** \$19.95 ECHO bookstore

*Dr. Robert Black & Dr. Kathleen Ruppert* 1995

Most people moving to Florida are not familiar with its plants and growing conditions. This book, developed by scientists at the University of Florida, provides current and no-nonsense information on how to plant and maintain trees, palms, shrubs, ground covers and vines in the Florida landscape. 234 pages, large paperback.

## **TROPICAL FRUIT, TROPICAL VEGETABLE AND CITRUS COOKBOOKS**

### **Maurice's Tropical Fruit Cook Book** \$2.95 ECHO Bookstore

*Maurice de Verteuil*, 1979

A recipe book devoted to the tropical fruits that can be found in Florida. 79 pages, paperback.

### **Citrus Lovers Cook Book** \$6.95 ECHO Bookstore

*Bruce & Lee Fischer*, 1980

Juices, salads, desserts, pies, preserves, sauces, marinades, salad dressings and more! 126 pages paper back.

### **For Citrus Only** \$7.50 ECHO Bookstore

*K. Armitage, C. Butterfield, J. Hurlock, C. Shafer*, 1994

This is a unique cookbook and complete guide filled with history, tropical island punches, wines, award-winning seafood recipes from local chefs, marinades, meat, poultry, salads, desserts, sorbets, snacks, home remedies, gardening, decorating and craft ideas. 155 pages, paperback

### **Fruit Cookbook** \$15.95 ECHO Bookstore

*Nicole Routhier*, 1996

400 sweet and savory fruit-filled recipes. Soups to desserts. 482 pages, paperback.

### **Fabulous Fruit Cooking** \$19.95 ECHO Bookstore

*Andreas Miessmer*, 1993

A Gourmet Guide to Great Fruit Dishes from Soup to Sorbet. Local and exotic fruits are used to make 80 delectable recipes. Easy-to-follow instructions and full color photographs make cooking with fruit fun and delicious. 140 pages, hardback.

### **Surprising Citrus** \$9.95 ECHO Bookstore

*Audra & Jack Hendrickson*, 1988

Here is a cookbook that explains everything you should know about cooking with citrus. It dispels the notion that you can only eat citrus raw. It includes descriptions of citrus as well as hints on cooking, buying, storing, handling and using. 150 pages, paperback.

### **Extending the Table...a world community cookbook** \$18.99 ECHO Bookstore

*Joetta Handrich Schlabach, et al.*, 1991.

A staff favorite at ECHO! Written in the tradition of the More with Less cookbook, but with truly international flair! Missionaries from around the globe sent in their favorite local specialties, which were then tested and edited for North American cooks. Inserted between recipes and sections are thoughtful quotes and essays on food, hunger, and life. 335 pages, paperback

## **VIDEOS**

### **ECHO's Tropical Fruit Crop Video Series** Call for prices. ECHO bookstore

*Carl Campbell*

Individual tapes are available for \$19.95 each. NTSC version. SECAM and PAL versions are available for \$30.00 per tape; \$125 for the whole set. Contact ECHO to purchase individual tapes or SECAM or PAL versions.

Tape #1 (73.03 min) Introduction to Tropical Fruit

Tape #2 (81.58 min) Part I. Grafting Tropical Fruit; Part II. Avocados

## Other Resources

Tape #3 (85.13 min) Part I. Guava, pineapple & macadamia; Part II. Mamey sapote, sapodilla, eugenia family, jaboticaba, velvet apple, black sapote, white sapote, white mombin, strawberry tree

Tape #4 (79.02 min) Part I. Atemoya, passion fruit, inga, loquat, naranjilla; Part II. Akee, tamarind, jujube, carissa; Part III. carambola, canistel, monstera, barbados cherry

Tape #5 (69.12 min) Part I. Mangoes; Part II. Papaya, coconut

Tape #6 (67.36 min) Part I. Banana & jackfruit; Part II. Conversation with Carl Campbell about tropical fruit.

## HELPFUL WEB RESOURCES

### IFAS (Institute of Food and Agricultural Sciences)

<http://www.ifas.ufl.edu/>

IFAS publications (including Fruit Crop Fact Sheets and other publications of interest to home fruit tree growers) are available for free from their website (as well as from County Extension Offices). An excellent resource for anyone interested in tropical and subtropical fruit tree cultivation. As well, there are also links to county extension offices, and other sites of agricultural interest.

### ECHO's Edible Landscape Nursery

<http://www.echonet.org/eln&herbs/nursery.htm>

Information related to ECHO's nursery is here, including a complete copy of our nursery catalog.

<http://www.echonet.org/> is our general ECHO website, where you can find out more information about ECHO and what we do.

## OTHER TROPICAL FRUIT GARDENS

### Fairchild Tropical Botanic Garden

10901 Old Cutler Road

Coral Gables (Miami), FL 33156

<http://www.ftg.org/>

One of the world's preeminent botanical gardens with extensive collections of rare tropical plants. The International Mango Festival, a yearly event, is an all-day extravaganza featuring the king of tropical fruit. It always takes place the second Saturday in July.

### National Tropical Botanical Garden – The Kampong

4013 Douglas Road,

Coconut Grove, FL 33133

Phone: (305) 442-7169

Fax: (305) 442-2925

e-mail: [kampong@bellsouth.net](mailto:kampong@bellsouth.net)

David Fairchild's home and private collection of mainly tropical fruit trees.

### Miami-Dade's Fruit and Spice Park

24801 S.W. 187 Avenue

Homestead, FL 33031

Phone: (305) 247-5727

e-mail: [RTropical@aol.com](mailto:RTropical@aol.com)

web: <http://www.floridaplants.com/fruit&spice/index.html>

Savor tropical and exotic fruits, vegetables, spices, herbs and nuts from around the world as you munch your way through the park.

### Marie Selby Botanical Gardens

811 South Palm Avenue

Sarasota, FL 34236

phone: (941) 366-5731

fax: (941) 366-9807

e-mail: [ContactUs@selby.org](mailto:ContactUs@selby.org)

internet <http://www.selby.org/>

A beautiful botanical garden on the Gulf in Sarasota – see tropical fruit trees, beautiful bamboo and an exquisite orchid display.

**COUNTY COOPERATIVE EXTENSION SERVICE OFFICES**

**Lee County Cooperative Extension Service**

Terry Park – 3406 Palm Beach Boulevard  
Fort Myers, FL 33916  
Phone: (239) 533-4327  
Fax: (239) 485-2305  
web: <http://lee.ifas.ufl.edu/>

**Collier County Cooperative Extension Service**

4700 Immokalee Road  
Naples, Florida 34120-1468  
Phone: (239)-353-4244  
Fax: (239)-353-7127  
E-mail: [cces@naples.net](mailto:cces@naples.net)  
web: <http://collier.ifas.ufl.edu/>

**Charlotte County Cooperative Extension Service**

6900 Florida Street  
Punta Gorda, FL 33950-5799  
Phone: (941) 764-4340  
Fax: (941) 764-4343  
E-mail: [charlotte@gnv.ifas.ufl.edu](mailto:charlotte@gnv.ifas.ufl.edu)  
web: <http://charlotte.ifas.ufl.edu/>

**Hendry County Cooperative Extension Service**

225 Pratt Boulevard  
Labelle, FL 33975-0068  
Phone: (863) 674-4092  
Fax: (863) 674-4098  
e-mail: [gmcavoy@gnv.ifas.ufl.edu](mailto:gmcavoy@gnv.ifas.ufl.edu)  
web: <http://www.ifas.ufl.edu/~gmcavoy/>

**Miami-Dade County Cooperative Extension Service**

18710 SW 288 Street  
Homestead, FL 33030-2309  
Phone: (305) 248-3311

**Southwest Florida Research and Education Center**

2686 SR 29 N.  
Immokalee, FL 34142  
Phone: (941) 657-5221  
web: <http://www.imok.ufl.edu/>

## 17. Plant Index by Common Name

- Abelmoschus manihot*, 41  
*Aberia caffra*, 21  
Acerola, 2  
*Achradelpha mammosa*, 35  
Akee, 34  
*Allium schoenoprasum*, 42  
Allspice, 45  
*Alpinia galanga*, 41  
*Alternanthera sissoo*, 43  
Ambarella, 34  
*Anacardium occidentale*, 34  
*Ananas comosus*, 30  
Anise, 46  
Annato, 46  
*Annona cherimola*, 34  
*Annona diversifolia*, 20  
*Annona muricata*, 32  
*Annona reticulata*, 18  
*Annona squamosa*, 32  
*Annona squamosa* x *A. cherimola*, 2  
Antidesma, 2  
*Antidesma bunius*, 9  
Apple, 2  
Arrowroot, 40  
*Artocarpus heterophyllus*, 20  
*Artocarpus hypargyrea*, 35  
*Artocarpus lingnanensis*, 35  
Assai Palm, 34  
Atemoya, 2  
*Averrhoa carambola*, 10  
Avocado, 3  
*Azadirachta indica*, 27  
*Bactris gasipaes*, 36  
Bamboo, 47  
Banana, 5  
Barbados Cherry, 9  
Basket Vine, 40  
Bay Leaf, 46  
Bay Rum, 46  
Belembe, 40  
Bignay, 9  
*Bixa orellana*, 46  
Black Raspberry, 37  
Black Sapote, 9  
Blackberry, 37  
*Blighia sapida*, 34  
Blueberry, 9  
*Bombax glabra*, 24  
*Brosimum alicastrum*, 36  
Bullock's Heart, 10  
Bunchosia, 10  
*Bunchosia argentea*, 29  
*Butia capitata*, 21  
Cacao, 34  
Caimito, 10  
Calamondin, 15  
Canistel, 10  
Carambola, 10  
*Carica papaya*, 28  
Carissa, 11  
*Carissa grandiflora*, 11  
*Carissa macrocarpa*, 11  
Cashew, 34  
*Casimiroa edulis*, 33  
Cassava, 40  
Cattley Guava, 11  
Ceriman, 37  
*Chalcas koenigii*, 46  
Chaya, 40  
Chayote, 41  
Cherimoya, 34  
Cherry of the Rio Grande, 12  
Chinese Laurel, 12  
Chocolate Pudding Tree, 12  
*Chrysophyllum caimito*, 10  
*Cicca acida*, 28  
*Cicca disticha*, 28  
*Cinnamomum verum*, 46  
*Cinnamomum zeylanicum*, 46  
Cinnamon, 46  
Ciruela, 12  
*Citrofortunella mitis*, 15  
*Citrofortunella* spp., 16  
Citrus, 12  
*Citrus aurantifolia*, 15  
*Citrus decumena*, 15  
*Citrus grandis*, 15  
*Citrus hystrix*, 16  
*Citrus limon*, 15  
*Citrus maxima*, 15  
*Citrus medica* var. *sarcodactylus*, 16  
*Citrus paradisi*, 14  
*Citrus reticulata*, 13  
*Citrus reticulata* x *C. sinensis*, 13  
*Citrus sinensis*, 12  
*Citrus trifoliata*, 18  
*Clausena lansium*, 33  
*Clausena punctata*, 33  
*Clausena wampi*, 33  
Clementine, 13  
*Cnidioscolus chayamansa*, 40  
Cocoyam, 41  
Cola Nut, 35  
*Cola* spp., 35  
*Colocasia esculenta*, 41  
*Cookia punctata*, 33  
*Cookia wampi*, 33  
Cranberry Hibiscus, 41  
Cuban Mangosteen, 17  
*Cupania sapida*, 34  
Curry Leaf Tree, 46  
Custard Apple, 18  
*Cymbopogon citratus*, 42  
*Dimocarpus longan*, 21  
*Dioscorea alata*, 44  
*Diospyros digyna*, 9  
*Diospyros kaki*, 29  
*Dovyalis caffra*, 21  
Drumstick Tree, 42  
Durian, 35  
*Durio zibethinus*, 35  
Eddo, 41  
Edible Hibiscus, 41  
Eggfruit, 10  
*Eleocharis dulcis*, 44  
*Eriobotrya japonica*, 22  
*Eugenia aggregata*, 12  
*Eugenia alba*, 33  
*Eugenia brasiliensis*, 19  
*Eugenia cauliflora*, 20  
*Eugenia dombeyi*, 19  
*Eugenia jambos*, 30  
*Eugenia javanica*, 33  
*Eugenia luschnathiana*, 30  
*Eugenia malaccensis*, 35  
*Eugenia uniflora*, 32  
*Euphoria longan*, 21  
*Euterpe oleracea*, 34  
False Roselle, 41  
*Ficus carica*, 18  
Fig, 18  
*Flacourtia indica*, 24  
Flying Dragon, 18  
*Fortunella* sp, 16  
Galangal, 41  
*Garcinia livingstonei*, 20  
Garlic Chives, 42  
Genip, 35  
Golden Apple, 35  
Governor's Plum, 18  
Granadilla, 39  
Grape, 37  
Grapefruit, 14  
Graviola, 18

## Plant Index

- Grumichama, 19  
 Guanábana, 19  
 Guava, 19  
*Guilielma gasipaes*, 36  
*Gynura crepioides*, 43  
*Hibiscus acetosella*, 41  
*Hibiscus sabdariffa*, 43  
 Hibiscus, Edible, 41  
 Hog Plum, 19  
 Honeybell, 13  
 Ice Cream Bean, 19  
 Illama, 20  
*Illicium floridanum*, 46  
 Imbe, 20  
 Indian Jujube, 20  
*Inga edulis*, 19  
*Inga spectabilis*, 19  
*Inga vera*, 19  
*Ipomoea batatas*, 43  
 Jaboticaba, 20  
 Jackfruit, 20  
 Jamaica Cherry, 21  
*Jambos malaccensis*, 35  
 Java Apple, 21  
 Jelly Palm, 21  
 Jocote, 21  
 June Plum, 35  
*Kaempferia galanga*, 41  
 Kaffir Lime, 16  
 Katuk, 42  
 Kei Apple, 21  
 Keiffer Lime, 16  
 Key Lime, 15  
 Kumquat, 16  
 Kwai Muk, 35  
*Languas galanga*, 41  
 Laurel, 46  
*Laurus nobilis*, 46  
 Lemon, 15  
 Lemongrass, 42  
 Lime, 15  
 Lime Leaf, 21  
 Limeberry, 21  
 Lipstick Tree, 46  
*Litchi chinensis*, 22  
 Longan, 21  
 Loquat, 22  
*Lucuma mammosa*, 35  
 Lychee, 22  
 Macadamia, 23  
*Macadamia tetraphylla*, 23  
 Madagascar Plum, 24  
 Malabar Chestnut, 24  
 Malanga, 42  
 Malay Apple, 35  
*Malpighia punicifolia*, 9  
*Malus domestica*, 2  
 Mamey Sapote, 35  
 Mamoncillo, 35  
 Mandarin, 13  
*Mangifera indica*, 24  
 Mango, 24  
*Manihot esculenta*, 40  
*Manilkara achras*, 31  
*Manilkara zapota*, 31  
*Manilkara zapotilla*, 31  
 Manioc, 42  
*Maranta arundinacea*, 40  
 Mayan Breadnut, 36  
*Melia koetjape*, 36  
*Melicocca bijuga*, 36  
*Melicoccus bijugatu*, 36  
 Minneola, 13  
 Miracle Fruit, 27  
 Mombin, Red, 27  
 Monstera, 37  
*Monstera deliciosa*, 37  
 Moringa, 42  
*Moringa oleifera*, 42  
*Moringa pterygosperma*, 42  
*Moringa stenopetala*, 43  
 Moringa, African, 43  
*Morus rubra*, 27  
 Mulberry, 27  
*Muntingia calabura*, 32  
*Murraya koenigii*, 46  
*Musa* sp., 5  
 Muscadine Grape, 37  
*Myrciaria cauliflora*, 20  
 Mysore Raspberry, 38  
 Naseberry, 27  
 Natal Plum, 27  
 Navel, 12  
 Nectarine, 28  
 Neem, 27  
*Nephelium lappaceum*, 36  
 Nesberry, 28  
 Nispero, 28  
*Nopalea opuntia*, 30  
 Okinawa Spinach, 43  
*Opuntia* spp., 30  
 Orange, 12  
 Otaheite Apple, 36  
 Otaheite Gooseberry, 28  
*Pachira aquatica*, 24  
 Papaya, 28  
*Passiflora edulis*, 39  
*Passiflora edulis* f. *flavicarpa*, 39  
*Passiflora quadrangularis*, 39  
 Passionflower, 38  
 Passionfruit, 39  
 Passionfruit, Giant Granadilla, 39  
 Peach, 28  
 Peach Palm, 36  
 Peanut Butter Fruit, 29  
 Pejibaye, 36  
*Persea americana*, 3  
*Persea nubigena*, 3  
 Persimmon, 29  
*Phyllanthus acidus*, 28  
*Phyllanthus distichus*, 28  
*Pimenta dioica*, 45  
*Pimenta racemos*, 46  
 Pimento, 47  
 Pina Palm, 36  
 Pineapple, 30  
 Pitomba, 30  
 Plantain, 7  
*Plinia cauliflora*, 20  
 Plum, 30  
 Pomegranate, 30  
*Poncirus trifoliata*, 18  
*Pouteria campechiana*, 10  
*Pouteria mammosa*, 35  
*Pouteria sapote*, 35  
 Prickly Pear Cactus, 30  
*Prunus persica*, 28  
*Prunus salicina*, 30  
*Psidium cattleianum*, 11  
*Psidium chinense*, 11  
*Psidium guajava*, 19  
*Psidium littorale*, 11  
 Pummelo, 15  
*Punica granatum*, 30  
 Purple Mombin, 31  
 Purple Passionfruit, 39  
*Quinaria lansium*, 33  
 Rambutan, 36  
 Raspberry, 38  
 Red Mombin, 27  
*Rheedia aristata*, 31  
 Rose Apple, 31  
 Roselle, 43  
*Rubus idaeus*, 37  
*Rubus neveux*, 38  
 Samba Lettuce, 43  
*Sandoricum indicum*, 36  
*Sandoricum koetjape*, 36  
*Sandoricum nervosum*, 36  
 Santol, 36

## Plant Index

- Sapodilla, 31  
Sapote, 31  
*Sauropus*  
    *androgynus*, 42  
*Sechium edule*, 41  
Sissoo Spinach, 43  
Sorrel, 43  
Soursop, 32  
Spanish Lime, 36  
Spinach Tree, 40  
*Spondias cytherea*,  
    34  
*Spondias dulcis*, 34  
*Spondias purpurea*,  
    27  
Star Apple, 32  
Star Fruit, 32  
Strawberry Guava,  
    32  
Strawberry Tree, 32  
Sugar Apple, 32  
Surinam Cherry, 32  
Sweet Orange, 12  
Sweet Potato, 43  
Sweetsop, 32  
*Synsepalum*  
    *dulcificum*, 27  
*Syzygium jambos*,  
    31  
*Syzygium*  
    *javanicum*, 33  
*Syzygium*  
    *malaccense*, 35  
*Syzygium*  
    *samarangense*, 33  
Tamarind, 33  
*Tamarindus indica*,  
    33  
Tangelo, 13  
Tangerine, 13  
Tangor, 13  
Tannier, 44  
Tapioca, 44  
*Theobroma cacao*,  
    34  
*Trichostigma*  
    *octandrum*, 40  
*Triphasia trifoliata*,  
    21  
*Vaccinium*  
    *corymbosum*, 9  
*Vanilla fragrans*, 39  
Vanilla Orchid, 39  
*Vanilla planifolia*,  
    39  
*Vitis rotundifolia*,  
    37  
Wampi, 33  
Water Apple, 33  
Water Chestnut, 44  
Wax Jambu, 33  
West Indian Cherry,  
    33  
White Sapote, 33  
Wild Clove, 47  
*Xanthosoma*  
    *brasiliense*, 40  
*Xanthosoma*  
    *sagittifolium*, 41  
*Xanthosoma* spp.,  
    41  
Yam, 44  
Yautia, 44  
Yellow  
    Passionfruit, 39  
Yuca, 44  
Yuquilla, 44  
*Ziziphus jujuba*, 20  
*Ziziphus*  
    *auritiana*, 20