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Deciduous Fruit for the Home Garden in Central Florida[1]

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Developing and maintaining a successful home orchard requires considerable horticultural skill since fruit trees are perennial. Homeowners who select the wrong cultivar or site generally fail regardless of how much care and attention they apply to their fruit trees.

Despite the careful attention needed for a successful home orchard, the pleasure of eating truly fresh fruit picked at its peak of maturity more than compensates the enthusiast for the time and effort. A well designed and well managed home orchard can furnish fine fruit, pleasant hours of gardening, and increased value to your real estate. This publication describes the various types of orchard fruits, their suitability to the Florida home orchard, and the process involved in raising a home orchard.

Descriptions

Stone Fruits

Peaches, nectarines, and plums are called stone or drupe fruits because they consist of a seed enclosed in a heavy pit or stone surrounded by soft flesh. Certain cultivars of these fruits can be successfully grown in Florida. (See tables 3 and 4.) Other stone fruits -- such as apricots, almonds, and cherries -- are not well adapted to Florida and should not be planted here. The various stone fruits are closely related, all being different species within the same genus, *Prunus*.

Figure 1. Plum blossom at the UF/IFAS teaching orchard in Gainesville, FL. Credits: Thomas Wright, UF/IFAS

Fruit Development

The fruit development occurs in stages. During the first stage, which starts immediately after fruit set, the stone or pit is soft, and the proportion of flesh to pit is small. The second stage is a transitional stage, during which the pit hardens. After pit hardening, the

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third stage begins. In this stage, the flesh develops rapidly, and the fruit diameter increases correspondingly. This stage is often called the "final swell."

Peach, nectarine, and plum trees often set too many fruit, and some of the fruit must be removed or "thinned" to obtain adequate fruit size. To obtain the maximum benefit from thinning, it must be done prior to pit hardening, which is the second stage of fruit development; this stage can be recognized by the increased difficulty of cutting through the pit with a knife. When the knife first encounters a resistance to cutting through the seed, the pit-hardening stage has begun.

Optimum soil-moisture conditions are essential to increase fruit size during the final swell. Irrigation is necessary during dry periods due to the characteristic shallow root system of stone fruits. Avoid frequent light irrigations, which tend to promote root development near the soil surface, further increasing the shallowness of the root system. A general rule is to apply 2 inches of water every 10 -14 days unless adequate rainfall occurs.

Measure the amount of water by placing a can or another straight-sided container under the tree during watering. When the water level in the can reaches 2 inches, enough water has been applied.

Peach and nectarine trees should make extensive terminal growth each year, which requires relatively heavy annual pruning. On the other hand, plums fruit on both long twigs and on very short twigs, called spurs. Since there is less terminal growth for plums than for peaches, correspondingly less pruning is needed. Fruit buds are produced during the spring and summer on current season growth.

Chilling Requirement

Most deciduous fruit trees, including stone fruits, require accumulated exposure to cool temperatures during winter dormancy for the resumption of normal growth the following spring. This requirement is specific for each cultivar and is referred to as a chilling requirement. Common cultivars grown in more northern climates are too high in chilling requirement to be grown successfully in Florida. Only cultivars adapted to Florida's mild winter climate should be considered.

In Florida, stone fruits tend to bloom soon after the chilling requirement is satisfied. This occurence, coupled with alternating periods of warm and cold weather during the late winter and spring in Florida, may result in early bloom, which is frequently damaged by late freezes. Because of this hazard, the warmest sites within the orchard should be reserved for stone fruits.

Rootstocks

Peach and nectarine rootstocks require good soil drainage. The 'Marianna' plum is not a good rootstock for peaches because the tree will be very short-lived. On the other hand, peach can be used as a rootstock for plums, but only when planted on well drained soils. In Florida, only rootknot-nematode-resistant peach rootstocks -- such as 'Flordaguard' -- should be considered.

Peaches, nectarines, and plums are susceptible to a multitude of pests, including diseases, nematodes, and insects. Thus, a regular pest-control program must be followed to ensure good fruit quality.

Pome Fruits

Apples (*Malus* sp.), pear (*Pyrus* sp.), quince (*Cydonia* sp.), and the native haw (*Crataegus* sp.), commonly called mayhaw, are examples of pome fruits. Currently, there are three apple hybrids of northern varieties crossed with very-low-chilling varieties that are adapted to central Florida conditions. Most apple, pear, and quince cultivars, however, are not well adapted to Florida because of their high chilling requirement.

Fire blight (a bacterial disease) and *Botryosphaeria dothidea* (a fungal disease) are particularly damaging throughout the southeastern United States. These plant diseases prevent successful production in Florida of most soft dessert or European-type pears.

Oriental or hard pears and some hybrids with European types are tolerant of fire blight and *B. dothidea*. Some of these cultivars are adapted to Florida's climate. Even adapted cultivars are

susceptible to leaf spot, and proper control requires more spraying than the hobbyist is likely to accept. Moreover, except for canning, the quality of Oriental pears is poor. On the other hand, pears will grow and produce on virtually all soils, and the large blooms have ornamental value. Some hobbyists are willing to accept the reduced yield and quality of the fruit that results from leaf spot.

The native haw makes a small, attractive dooryard tree, but the small fruits are used only for making jelly.

Persimmons

The Oriental persimmon (*Diospyros kaki*) is well adapted to Central Florida. This persimmon is usually budded on native persimmon (D. *virginiana*) seedlings.

Care must be taken in fertilizing persimmons because excessive nitrogen fertilization increases plant vigor and may cause young fruit to drop prematurely. Late growth in the fall and activation of cambial growth of the trunk during warm periods, followed by freezing temperatures in the winter, may cause bark to split and cold cankers to develop. Persimmon is susceptible to *B. dothidea*, which can be exacerbated by cold injury.

Some cultivars are seedy; others are seedless. Some must become soft before the fruit loses its astringency. Others are non-astringent and can be eaten while still firm and crisp. The demand for persimmon in the United States is very small even though the persimmon is a favorite fruit of commercial significance in the Orient. For local use, persimmons can be grown on a wide range of soils with little or no pest control or pruning after the initial training for tree structure. The tree itself has large, glossy, green leaves and highly colored fruit, which makes it a beautiful dooryard tree.

Figs

The edible fig (*Ficus carica*) is structurally a fleshy, hollow stem with flowers produced on the inner walls of the cavity. There is an opening or eye at the apex of the false fruit, through which disease organisms and insects can enter, causing souring and splitting. However, cultivars differ in the extent to which this eye is "open." Cultivars such as 'Celeste', which have eyes that are not open until near maturity, are best adapted to Florida.

Some cultivars require cross-pollination by a special wasp, which is not present in Florida. Those cultivars should not be planted because the fruits fall before maturing.

Fig trees grow vigorously. While they do not require pruning for continued fruit production, pruning helps control tree size and prolongs the fruiting season. Although the fig is quite hardy when fully winter dormant, it often leafs-out early in the spring and is killed back by late freezes. This occurrence generally keeps the tree from attaining a large size and results in development of a bush form with several major branches, rather than a tree with a single trunk.

The fig is best adapted to near-desert conditions, but actually grows well throughout most of the southern United States. In Florida's humid climate, fig rust should be controlled with approved fungicide sprays. A fruit weevil, which cannot be controlled economically, often causes damage. Rootknot nematode can cause severe damage, especially on deep, sandy soils. On sandy soils, best results are obtained when trees are planted near a building or heavily mulched. In both cases, a more favorable root environment is furnished. Full sun is desirable, and competition from grass and other plants should be avoided.

Pecans

The pecan is one of the most important tree crops grown in the South and makes a beautiful dooryard tree. It belongs to the *Juglandaceae* family, along with the hickories and black walnuts, but in a separate genus (*Carya*).

Perhaps the most vexing problem with pecans is their tendency to bear heavy crops some years and very light or no crops during other years. Additionally, there is also a tendency for many nuts to be poorly filled. Several factors contribute to these problems. For one, the pecan requires large amounts of food, which is produced by the leaves, for kernel

formation or "filling" in the late summer and early fall, just prior to leaf drop. When crops are excessively heavy, there is not enough food to fill the nuts, the shell of which formed much earlier. Heavy crops also deplete the food reserves needed to form flower buds in the following spring. Such depleted food reseves can cause a light crop the following year.

Thus, to produce the maximum amount of food for the maturing nuts and for the following year's flowers, pecan leaf surfaces must remain undamaged during the growing season and into the fall. However, many diseases, insects, and mites may damage the leaves sufficiently to cause poor filling and flowering.

A fall flush of new leaves is also very damaging because this flush of new leaves requires food that would otherwise be used for formation of nuts and flowers. New leaves do not mature soon enough to produce sufficient food to compensate for that used in their formation.

Damage to the green shuck of the pecan by pests -- such as shuck-worm or scab -- may result in poor filling even though a good leaf surface is present. Cultivars susceptible to scab should not be planted. Erratic or alternate bearing can be held to a minimum through proper pest control and other cultural programs.

The pecan is somewhat unique in its production of female flowers on the tips of new shoots and production of male flowers, catkins, on the old wood. If, as is sometimes the case, male flowers produce pollen at a time when female flowers are not receptive, the failure to pollinate results in little or no crop. However, lack of pollination is sometimes not a problem in pecan areas because pollen from cultivars that mature their pollen at different times is carried by wind to female flowers of cultivars that do not have their own pollen available.

While pecan trees can be grown rather easily, a good crop requires well fertilized soil and a carefully planned and executed program of pest control. This sort of program and site selection is often not possible for the producer of dooryard pecans. With adequate insect and disease control, plus careful site and cultivar selection, pecans can grow and produce well in Central Florida. The erratic bearing can be tolerated because the beauty and shade produced justify the planting of dooryard pecan trees.

Blackberries

There are several species of *Rubus* called blackberries. Some are upright and require no support; others are trailing and require a trellis. The trailing types are called dewberries.

Blackberries are one of the easiest to grow and most widely adapted fruits. Native species and commercial plantings extend from Florida to the Pacific Northwest. However, cultivars differ as to winter chilling requirement and susceptibility to diseases. Proper cultivar selection is important for successful production.

Blackberries produce their flowers and fruits on the previous year's growth. These shoots die back at the end of the fruiting year, and new growth, which arises from below the ground in the spring, forms the new fruiting surface for the next year. This growth is very extensive during Florida's long growing season, permitting the pruning of both old and new growth back to ground level immediately after harvest (see Training and Pruning). In Central Florida adequate growth comes after pruning to support good crops the next year.

Since blackberries produce shallow, fleshy root systems, deep cultivation must be avoided. Many new plants arise from the root system several feet from the plant and must be removed to keep an organized, easy-to-manage planting.

Blackberries thrive on virtually all soils. Additionally, because blackberries have a prolonged bloom season, complete crop loss due to late-spring frosts is less likely for blackberries than for many other fruits.

Chestnuts

Prior to the twentieth century, the native American chestnut was one of the most common trees in forests throughout eastern North America. However, by the middle of the twentieth century, the chestnut blight of 1904 had killed almost all American chestnut trees.

Chinese chestnut trees and American x Chinese hybrid chestnut trees with good nut quality are resistent to chestnut blight and can be grown successfully in Florida. Chestnuts are adapted to areas of Florida where pecans grow well.

Chestnuts prefer a well drained, upland sandy soil. The nuts are coverd with burrs that contain extremely sharp spines. Gloves are required when handling the nuts prior to removal from the burrs. The burrs may also be a concern in home landscapes where children play or in places of heavy foot traffic.

Chestnuts, unlike most nuts, are low in fat and have about a third the calories of other nuts. Chestnuts also contain vitamin C and are a source of high-quality protein.

Blueberries

Two types of blueberries can be grown in Florida: rabbiteye (*Vaccinium ashei*) and southern highbush, which is a hybrid of *V. ashei*, *V. corymbosum*, and *V. darrowi*. Low-chilling cultivars of rabbiteye and southern highbush, developed by the University of Florida and elsewhere, are well adapted to various regions of Florida. Generally, rabbiteyes grow best in regions of Florida where winters are as cold as or colder than winters in Ocala. Southern highbush cultivars are best adapted to areas of Florida south of Ocala and north of Sebring. However, these cultivars can grow well in Gainesville if their flowers are protected from late-winter and early-spring freezes.

Blueberries form a bush with numerous canes arising at or near the base of the plant. The canes and their branches survive and produce fruit for several years, but eventually become weak and sometimes die back. Occasionally, the bush becomes too thick for easy harvesting. This condition is corrected by pruning out several of the leaders or branches.

Blueberries require acid soils (pH 4.0 to 5.2) and benefit from mulch and relatively high soil organic matter content (2-3%). Soil organic matter may be increased during the establishment period by incorporating acidic peat into the planting hole. Blueberry roots grow near the soil surface and are very susceptible to injury from overfertilization. For young blueberry plants, fertilizer should be applied frequently in very small amounts. Blueberries respond better to ammoniacal N than to nitrate N. Acid-forming azalea or camellia fertilizers usually work well for blueberries. Because blueberries are shallow-rooted, blueberries are often damaged when cultivation is used for weed control. Mulch is preferred to cultivation for weed control in blueberries for at least two reasons: (1) roots are not damaged and (2) the mulch decomposes and adds organic matter to the soil. Despite the very specific demands of the blueberry, the plants are long-lived.

Grapes

There are several species of American-type grapes native to the southeastern United States. These species include the muscadine (*Vitis rotundifolia*) cultivars and several other species of slip-skinned grapes, so called because the entire ball of flesh will slip from the skin when the fruit is squeezed. These grapes have tough skins and flesh and are seedy. The tender-fleshed, seedless European-type grapes (*V. vinefera*) are not adapted to the southeastern United States. Hybridizing programs have resulted in American cultivars much better than the native types.

The grape produces on long branches, called canes, of previous season's growth. A great many of these canes must be removed each year and the others must be cut back rather severely. For commercial production, no fruit crop has such a demanding pruning requirement. Satisfactorily producing fruit for the home or local market, however, requires a less exacting program.

Grape arbors, often used to landscape an area, require that canes be thinned out and cut back only occasionally to prevent growth from becoming too dense.

Adapted cultivars tolerate a wide range of soils. Cultural practices -- such as fertilizing, irrigating, and pest control -- are not unusually demanding. Florilush rootstock is showing more vigor and less damage from grape root borer.

Planting the Orchard

The Site

Site Selection. Home gardeners should select orchard sites near enough to their homes for convenience, but far enough away to allow the safe application of pesticides. Avoid selecting low-lying areas, where cold air tends to collect during calm radiation freezes. Thick woods and undergrowth on the lower side of an orchard may prevent drainage of cold air away from the orchard, thereby increasing the frost hazard.

Fertile, sandy-loam soil underlaid with a reddish-yellow to red subsoil that has moderate internal drainage is best for most fruits. Deep sands that do not hold moisture are usable if properly irrigated and fertilized. Soils with gray or mottled subsoils are poorly drained and not suitable for fruit orchards.

Site Preparation. A soil test should be conducted several months before planting an orchard. If soil-test results indicate a need for phosphorous or lime, apply as indicated prior to planting the orchard.

Planting

Fruiting plants may be sold either as containerized or bare root. Either is acceptable provided they are properly handled and cared for prior to planting.

Planting container-grown plants. Containerized plants can be planted during most of the year provided adequate irrigation is available. However, the most desirable time is during late winter, after the coldest weather has passed, but before growth begins in the spring. Fall planting should be avoided since this may interfere with the onset of dormancy and associated cold hardiness prior to cold winter temperatures.

Thoroughly irrigate plants before planting. Remove the plant from the container immediately prior to planting so that the roots remain moist. Examine the root system carefully. There should be enough roots to hold the media together in a “root ball,” but roots should not be extremely dense.

Very dense roots growing in a circle at the bottom of the container are an indication that the plants have grown in the containers for too long before being transplanted or moved to a larger container. These “pot-bound” plants may not grow well after transplanting. Any circular roots should be cut with a knife or pulled out from the root ball and spread in an outward orientation in the planting hole.

The planting hole should be considerably larger than the root ball on all sides. However, at planting, the upper surface of the root ball should be about level with the soil.

In light, sandy soils, the backfill may be mixed with a source of organic matter, such as peat moss. Be sure to remove all air pockets in the backfill by adding water to the hole during the refilling process. Mulch can help reduce moisture stress during plant establishment. During establishment, irrigation should be applied directly to the original root ball as well as to the surrounding soil. During warm weather, it is important to irrigate the root ball frequently until roots have become established in the surrounding soil.

Planting bare-root trees. Bare-root trees should be purchased and planted during winter or early spring, before growth begins. Plant trees without delay when they arrive from the nursery. Keep the trees' roots moist and protected from dry air and direct sunshine prior to planting.

If planting cannot be done when plants arrive, plants should be "heeled in" in a shady area. Dig a hole in which several plants can be placed and their roots covered with moist soil, sawdust, leaf mold, or some other suitable material. For easier handling, slant the plants in the holes.

Planting is a good time to inspect roots for signs of insects, diseases, nematodes, or other abnormalities. Keep the trees' roots moist during planting. Prepare the planting hole large enough so that the root system is neither crowded, bent, nor broken. Remove extra-long or broken roots prior to planting. Place plants upright and at the same depth at which they grew in the nursery. Fill the planting hole with one or two shovels of soil at a time, packing the soil lightly around the roots to remove air pockets.

Repeat this procedure until the hole is full of soil and the plant is firmly in place.

Fertilizer should not be placed directly in the planting hole; that practice can result in high salt concentrations near the roots. Such concentrations can damage young trees. Because most of the roots capable of nutrient-uptake were probably left in the nursery at digging, and because of the frequent irrigation schedule needed during establishment, much of the fertilizer applied at planting will be leached below the root zone before it can be taken up by the plant.

Add water when the hole is about two-thirds filled with soil in order to settle the soil around the roots. The trunk can be moved until air bubbles stop forming, thus assuring the removal of many of the air pockets. After the water has soaked into the soil, finish filling the hole. Give particular attention to irrigation during the first year. Adding mulch will conserve moisture, but it will not substitute for watering during dry periods.

Fruit trees may be planted anytime during the dormant season, but the period from late December through January is best. Planting during those months allows time for soil to settle and roots to become established before spring growth. Trees planted late in the spring are more likely to die during the following dry periods of that year.

Pruning or heading back at planting time is desirable. Removal of about one half of the top growth is recommended -- cutting back to about knee high on peach, plum, apple, pear, and chestnut. (See discussion below under Pruning and Training.)

Buy vigorous plants of average size from a reliable nursery. Do not use stunted, spindly, or old trees. Cheap nursery stock is often incorrectly labeled and of poor quality and may result in slow-growing, poorly developed trees.

The spacing of plants in a home orchard can vary considerably due to location and equipment to be used in cultivation. Suggested spacing is provided in Table 1.

Table 1. Suggested Spacing of Fruit Trees

Crop	Spacing in Feet[z]
Blueberries	
- Rabbiteye	6 x 12
- Highbush	3 x 10
Chestnuts	20 x 20
Figs	10 x 12
Muscadine Grapes	15 x 10
Bunch Grapes	10 x 10
Persimmons (Japanese)	10 x 15
Pears	20 x 20
Peaches and Nectarines	15 x 20
Plums	10 x 20
Pecans	60 x 60
Blackberries	5 x 12
Apples	15 x 20

[z]The first number refers to the space between trees within a row, and the second number refers to the space between rows. So 6 x 12 means 6 feet between the trees in a row and 12 feet between rows.

Cultivars

Table 2 lists persimmon cultivars for North Florida. See Table 3 for characteristics of peach and nectarine cultivars. Table 4 provides information on plum cultivars. Table 5 provides information on pear cultivars. Table 6 is on pecan cultivars. See Table 7 is on blueberry cultivars. Table 8 gives information on grape cultivars.

Apple

'Anna' is medium-size fruit that ripens in late June and early July. Its shape is similar to 'Delicious', but with approximately 30-40% red blush. Flavor is good (sweet to semi-acid).

'Dorsett Golden' is a medium-size fruit that ripens in late June with a 10% red blush. Its shape is similar to 'Golden Delicious'. 'Dorsett Golden' flavor is sweet, and fruit are firmer than 'Anna'.

'TropicSweet' (Fla. 90-3) is released by the Florida Agricultural Experiment Station and patent rights assigned to Florida Foundation Seed Producers, Inc. for distribution. This variety originated as [(N.J.38 x 'Anna') polycross]. 'TropicSweet' blooms with 'Anna', but ripens five to

seven days before, during early June at Gainesville. Trees of 'TropicSweet' are not self-fruitful, but this variety is cross-pollinated with either 'Anna' or 'Dorsett Golden'. Fruit are less red, firmer, and taste sweeter than 'Anna'. Fruit sugar levels are 14 - 15 brix, but acidity in fruit is low, resulting in a very sweet taste. Fruit size are similar to 'Anna'-comparable crop loads. Fruit are round-conic. Trees are semi-spreading and semi-spur type bearing habit.

Fig

'Brown Turkey' is a medium-size, small fruit that ripens about mid-July and bears over an extended period if growing conditions are good. 'Brown Turkey' bears a small crop the season following severe freeze damage.

'Celeste' is a small, light-brown to violet fruit. It ripens about mid-July. It does not sour as badly as 'Brown Turkey' because of a tight "eye," but does not fruit the season following severe freeze damage.

Other cultivars: 'Green Ischia', 'Alma', and 'Magnolia'.

Chestnut

'AU-Cropper', 'AU-Leader', 'AU-Homestead', and 'Black Beauty' are suitable Chinese chestnuts. 'Dunstan', 'Lucky 13', and 'Carpenter' are recommended Chinese x American hybrids.

Blackberry and Raspberry

Blackberry cultivars that can be grown for home use in Central Florida include 'Flordagrand', 'Oklawaha', and 'Brazos'. These berries are of excellent quality and mature in late April and early May. 'Flordagrand' and 'Oklawaha' are self-unfruitful, so alternate rows or alternate plants of each should be used for cross-pollination. Thornless cultivars cannot be grown in Central Florida.

'Dorman Red' and 'MySore' are the only raspberries worth trial in Florida. However, Central Florida may have inadequate chilling for 'Dorman Red', and cold damage my occur in this region with 'MySore', which is a tropical raspberry.

Table 2. Persimmon Cultivars for Central Florida

Cultivar	Astringency[z]	Skin Color	Pollinator[y]
Fuyu (Fuyugaki)	NA	Red	No
Hachiya	A	Red	Yes
Hanafuyu	NA	Reddish orange	No
Izu	NA	Orange-red	No
Matsumoto Wase Fuyu	NA	Reddish orange	No
O'Gosho	NA	Orange-red	No
Jiro	NA	Reddish orange	No
Saijo	A	Reddish orange	No
Tamopan	A	Reddish orange	No
Tanenashi	A	Yellow-orange	No
Gailey[x]	A	Red	No

[z] A - Astringent, NA - Nonastringent
[y] Most persimmons set heavier crops with cross pollination.
[x] Gailey is a pollinator. If it is used there will tend to be some seed in all cultivars in the planting.

Some success can be obtained by purchasing raspberries from northern sources after the plants have obtained chilling, then growing them as annuals in Central Florida. 'Autumn Bliss' and, especially, 'Heritage' have been studied for this use. As far south as Homestead, FL, plants were set out in late January. They broke dormancy immediately and fruited from late March through May. Fruiting started first on the old primocanes that had grown earlier up north and then from young growth that was produced in Central Florida.

Table 3. Peaches and Nectarines Grown in Central Florida

Cultivar	Chilling Units[z]	Bloom to Ripe (Days)	Color[y]	Fruit Size (Gr.)	Stone Freezes	Flavor[x]
Peach						
Rayon	175	105	Y	109	free	8
TropicSweet	175	95	Y	110	semi-free	10
TropicSnow	200	94	W	108	semi-free	10
Earligrand	200	75	Y	80	semi-cling	6
Flordastar	225	75	Y	80	semi-cling	8
Flordaglo	225	84	W	90	semi-cling	8
UFGold	225	80	Y	90	cling	9
UFBeauty	200	83	Y	110	semi-cling	9
UFO[w]	250	95	Y	70	semi-free	10
UFSun	100	90	Y	130	semi-cling	9
TropicBeauty	150	89	Y	100	semi-cling	9
Nectarine						
Sunraycer	250	85	Y	110	semi-cling	9
Sunbest	225	83	Y	95	semi-free	9
UFQueen	250	95	Y	120	semi-cling	
UFRoyal	225	85	Y	140	semi-cling	

[z] Chilling units refers to the number of hours the tree must spend below 45°F to break dormancy and initiate budding.
[y] Y=yellow, W=white, R=red
[x] 1=poorest, 10=best
[w] 'UFO' ia a doughnut peach.

Table 4. Characteristics of Plum Cultivars

Cultivar	Period of Ripening	Fruit Size	Skin Color	Flesh Color	Requires Pollinator
Gulfbeauty	Early	Small	Red	Yellow	Yes
Gulfblaze	Early	Medium	Red	Yellow	Yes
Gulfruby	Early	Medium	Red	Yellow	Yes
Gulfrose	Early	Medium	Red	Purple	Yes

Table 5. Characteristics of Pear Cultivars

Cultivar	Fruit Size	Peel Color	Flesh Texture	Soften in Storage
Flordahome	Medium	Yellowish green	Fine	Yes
Hood	Large	Yellowish green	Fine	Yes
Pineapple	Medium	Yellowish green	Coarse	No

Table 6. Characteristics of Pecan Cultivars[z]

Cultivar	Nuts Per lb.	Quality	Cracking[y]
Curtis	65-70	Good	1
Desirable	40-45	Excellent	3
Moreland	45-50	Excellent	1
Cape Fear	52-55	Very Good	3

[z] All cultivars listed are relatively resistant to scab. Do not plant varieties that scab severely.
[y] Refers to the ease of cracking the shell, with 1 being the easiest and 5 being hardest to crack.

Table 7. Blueberry Varieties Grown in Florida

Cultivar	Pollination[z]	Mean Date of First Harvest[y]	Chilling Units
Southern highbush			
Sharpblue	1	May 1	150
Gulf Coast	1	May 1	200
Emerald	1	April 20	200
Jewel	1	April 20	200
Windsor	1	May 1	200
Springhigh	1	May 1	250
Rabbiteye			
Climax	2	May 25	450
Chaucer	2	May 20	400
Brightwell	3	June 3	400
Woodard	2	June 3	400
Powderblue	3	June 15	550
Briteblue	3	June 15	500

[z] Plant two or more cultivars together with same number. [y] First 20% of crop ripe in Gainesville, FL

Table 8. Characteristics of Grape Cultivars

Type	Cultivar	Color	Self-fruitful*	Requires Rootstock
Bunch	Lake Emerald	green	yes	no
	Blue Lake	blue	yes	no
	Stover	golden	yes	yes
	Conquistador	blue	yes	yes
	Daytona	red	yes	no
	Suwannee	golden	yes	no
	Blanc du Bois	golden	yes	no
Muscadine	Fry	bronze	no*	no
	Carlos	bronze	yes	no
	Welder	bronze	yes	no
	Tara	bronze	yes	no
	Summit	bronze	no	no
	Sweet Jenny	bronze	no	no
	Pam	bronze	no	no
	Granny Val	bronze	yes	no
	Doreen	bronze	yes	no
	Noble	black	yes	no
	Southern Home	black	yes	no
	Nesbitt	black	yes	no
	Black Beauty	black	no	no
	Black Fry	black	no	no
	Polyanna	black	yes	no
	Supreme	black	no	no

* When self-unfruitful are being planted, it is necessary to include at least one self-fruitful cultivar for pollination.

Fertilization

General

Precise fertilizer requirements of tree fruits may vary appreciably depending upon the soil, even within the same orchard. Any number of fertilizer programs will result in good production, but some will be wasteful. Growers should observe the response of plants to each fertilizer application and lower or raise future applications accordingly.

Soil tests -- especially tests of soil pH, phosphorus, potassium, calcium and magnesium levels -- may be helpful in determining fertilizer requirements. However, keep in mind that responses to fertilizer are slower for tree crops than for annual crops. Leaf-tissue analysis is available for some of the aforementioned crops and can also be helpful. Contact your county Extension office for details on leaf-tissue analysis.

In small orchards, application of fertilizer by hand is satisfactory. The fertilizer should be spread evenly around the tree, covering all the area under the branches.

Preplanting

Adequate preplanting preparation and fertilization is necessary in the production of fruits and nuts. Soil testing of the area to be planted may be useful in determining the need for phosphorous and lime. Zinc deficiencies have occurred in many orchard crops in Florida. The correction of soil pH and zinc levels will often benefit young plants. Zinc should be applied to the orchard at the rate of 10 pounds of zinc oxide equivalent per acre about every five years. Zinc application may be done at any time.

Peach, Plum, Pear, Persimmon, Apple, and Fig

Apply about 1 lb of 10-10-10 fertilizer per tree during May of the first season after planting. Each February in succeeding years, apply about 1.5 lbs of 10-10-10 fertilizer for each year of age of the tree until a maximum of 10 - 15 lbs per tree is reached. Excessive nitrogen fertilizer results in vigorous growth that requires excessive pruning and drastically reduces the number of fruit buds formed, which can lead to increased acid levels in fruit. Additionally, overly vigorous pear trees are often attacked by the bacterial disease, fire blight, and the fungal disease, *Botryosphaeria dothidea*.

Pecan and Chestnut

In May apply 1 lb of 10-10-10 per tree the first season. After the first season, apply 10-10-10 fertilizer each February at the rate of 2 pounds for each year of age of pecan trees with the maximum of 50 pounds per tree. Chestnuts require about 1 pound for each year of age with a maximum of 15 pounds per tree.

Blueberry, Blackberry, and Grape

Blueberries are very sensitive to nitrogen and can be easily killed, particularly when they are young. Exercise extreme caution when fertilizing these young plants. An annual application of 2 ounces of acid fertilizer (such as for camellias and azaleas) per plant in February is ample fertilizer on 2-year-old blueberry plants.

Mature blackberry vines should receive three applications of a third of a pound of a complete fertilizer (i.e., 10-10-10) with the first application in late February, the second shortly after harvest, and the third in late August.

Grapes (bunch and muscadine) should be fertilized at the rate of 1 1/2 pounds of 10-10-10 for each year of age with a maximum of 5 pounds per plant applied in late February.

Cultivation and Mulching

Cultivation for weed control is necessary, but should be shallow and as infrequent as possible. Completely avoid deep plowing. The most common method of cultivation is disking, but chopping and mowing also are used.

An area around young plants at least 3 feet in diameter should be kept continuously free of weeds to prevent heavy competition with the shallow roots. Older trees can be cultivated less frequently.

On deep, sandy soils infested with nematodes, a heavy mulch will be required if figs are to be grown satisfactorily. The orchard floor of peaches and other fruits often damaged by frost during bloom should be kept clean. Heavy weed growth, cover crops, and mulches add to the frost hazard by insulating the soil from the sun during the day and decreasing the radiation of heat from the soil at night.

Mulching young plants may control weeds and conserve moisture. Many materials are available for use in small plantings or around single trees. Materials such as oak leaves, pine needles and hay are suitable. Sawdust is satisfactory, but includes a risk of termites. If sawdust is used as a mulch, do not incorporated the sawdust into the soil. Especially in warm, moist conditions, that practice can reduce the amount of nitrogen available for plant growth as the nitrogen becomes tied up by bacteria decomposing the sawdust. To avoid that condition, apply extra nitrogen. Keep in mind, however, that additional nitrogen applications may result in undesirable vigorous growth late in the season. Young trees, kept in a state of vigorous growth, are more susceptible to cold injury.

Pruning and Training

Proper pruning and training of fruit trees is necessary to obtain maximum yields of high-quality fruit throughout the life of the home orchard.

Pruning is a general term that refers to selective removal of plant parts to obtain a desired growth response. For fruit trees, pruning usually refers to the removal of limbs, twigs, or shoots to increase production of high-quality fruit and maintain tree vigor. Pruning should be done annually as needed to regulate tree shape, size, vigor, and crop load.

By contrast, training should begin at planting and may consist of light pruning along with other practices, such as spreading, bracing, bending and trellising of limbs, shoots or canes.

Different training systems are used for different types of fruit plants. Pear and apple trees are usually trained to a modified central-leader system, which results in an upright tree with spreading lateral branches. Peach, nectarine and plum trees are best trained to an open-center system, which results in a low, wide-spreading tree. Grape vines and trailing blackberries are trained to a systematic distribution of growth on a trellis.

Training Systems

Begin training at planting time

Untrained fruit trees usually do not develop growth habits suitable for production of high yields of quality fruit. Tree training should begin at planting to minimize the need for later corrective training. Some shoot tissue should be removed at planting time since many roots are lost or damaged during transplanting. This helps the tree become established and begins the training process. Generally, about one-third to one-half of the top should be removed at planting. The manner in which this is done depends on the training system.

The modified central-leader system

Trees trained to the modified central-leader system usually have five to seven well spaced scaffold limbs 6 - 10 inches apart on the central leader, radiating from the tree axis in different directions. The lowest branch should not be lower than two feet above the ground. This training system is relatively simple, produces a strong framework and is well suited for dooryard pears and apples.

Apple and pear trees are normally purchased as unbranched plants (whips) about four feet high. At planting, the whips should be cut back to about 32 - 36 inches above the soil surface to stimulate development of lateral shoots.

Some of these lateral shoots will later become the leader and major scaffold limbs, the structural framework of the tree. Usually, two or three exceptionally vigorous lateral shoots will develop just below the heading-back cut made on the young tree at planting. When these lateral shoots are several inches long, select one to continue as the central leader. Remove the competing lateral shoots, and remove all shoots within 20 inches of the ground. Be careful to remove all unwanted shoots at their point of origin.

Select four to six of the remaining lateral shoots that are evenly distributed radially around the trunk and vertically spaced 6 - 8 inches apart. These lateral shoots will form the major scaffold limbs.

If branched trees are planted, it may be possible to use existing lateral branches as the major scaffold limbs.

The open-center system

This is the training method of choice for peaches, nectarines and plums.

Open-center trees usually contain from three to four major scaffold limbs with no central leader. At planting, prune the dominant leader to a height of 24 - 30 inches above the soil surface. Larger trees usually have side branches. Remove all side branches less than 16 inches from the soil surface. Select three or four lateral branches that are distributed evenly around the tree trunk and spaced at least 4 inches apart vertically; reduce their lengths to 3 - 4 inches. Remove all other branches and shoots at their point of origin. The major scaffold limbs will develop from the 3-to-4-inch stubs or from new branches that develop from the trunk. The objective is to develop three to four primary framework (scaffold) limbs that form an "open-centered" tree canopy. Plum trees are pruned much like peach although plums may have more usable branches. Plum trees may also be pruned more lightly than peach trees.

Training other fruit trees

General rules for other fruit trees include removal of the upper third of a pecan or persimmon tree at planting. The young fig plant should be headed back to about half its height. Nursery grape plants should be cut back to two buds on the most vigorous cane; all other canes should be removed. Blueberries should not be permitted to fruit the first season. Prune or remove the fruiting buds at the end of the shoots at planting or before flowering.

Pruning in early or prebearing years

The modified central-leader system

During late winter or early spring following the first growing season, continue selecting scaffold limbs. Remove any shoots originating from the main trunk that are not needed for scaffold-limb development. Cut back existing scaffold limbs slightly to encourage branching and spur development. The central leader should be cut back to about 20 inches above the highest scaffold branch to encourage development of more scaffold limbs and maintain dominance of the central leader. In subsequent years, after five to seven properly positioned scaffold limbs have been developed, continue to remove shoots that compete with the central leader, and cut back scaffold limbs slightly to encourage branching and spur development. The central leader should be cut back sufficiently each year for the first three years to stimulate its regrowth and maintain its dominace over scaffold limbs.

The open-center system

During late winter following the first growing season, complete the selection of the three to four major scaffold limbs. Other shoots originating from the trunk should be removed. The major scaffold limbs should be cut back to 24 - 36 inches from the trunk to stimulate lateral-shoot development. To stimulate additional branching, the following year's winter pruning should consist of cutting back the lateral shoots that have developed on scaffold limbs during the previous growing season.

Pruning during later years

Mature apple and pear trees should not be pruned severely. For these trees, moderate annual pruning is preferred to heavy pruning every three or four years. Heavy pruning reduces flowering and excessive vegetative growth, which can promote fire blight.

Peaches, nectarines and plums should be pruned annually. Remove crossing branches and those that are growing into the center of the trees. Cut back vigorous shoots to outward-growing branches or buds to stop upward growth. Remove root suckers and exceptionally vigorous upright shoots, known as

water sprouts. These often develop in the center of the trees. Thin out some of the smaller branches to reduce crowding.

Prune peaches after the coldest part of the winter passes, but before flowering. During the growing season, rub off shoots that develop on the trunk and on scaffold limbs within 2 feet of the trunk.

Mature pecan and persimmon trees require little pruning. It may be necessary to lift low branches of persimmon to permit cultivation and to remove damaged branches.

Pruning of the fig depends upon the cultivar and condition of the plants. In the South, most figs are grown as bushes. Generally, it is only necessary to head back the branches to keep the plant within bounds, thin out weak growth and remove dead wood.

Proper pruning of bunch grapes provides an adequate amount of one-year-old wood each year and prevents accumulation of unproductive wood. Vary the amount of cane pruning according to the vigor of the vine and its capacity to carry a crop. More buds left on a vine will result in more berries per plant. The size and quality of fruit and the vigor of the vine will decrease if more than the optimum number of buds is left.

In the single-trunk, four-cane Kniffin system of training, string a top wire (No. 9) 4.5 - 5 feet high and another wire 18 inches lower along the row. Retain and tie only four canes per vine, one to the right and one to the left of the trunk on each wire. Remove all other canes, except for a few, which should be cut back to spurs containing two to three buds on the trunk as renewal canes for the next year.

Annual pruning of muscadine grapes involves cutting back all shoots to spurs of 4 - 6 inches in length, leaving one to three buds per spur, with spurs spaced 4 - 6 inches apart on permanent arms that have been established to the right and left of the trunk on a two-wire trellis.

Grapevines often "bleed" from pruning cuts. This harmless loss of sap (mostly water) usually stops completely when leaves appear.

The basic objective of pruning blueberries is to promote the growth of strong new wood, control plant size, and maintain good fruit production. If too little pruning is done, the plants will become crowded with weak, twiggy growth and fail to develop strong new wood for future production. Severe pruning produces fewer but larger berries and more new wood.

Experience is the best guide on how much to prune. The best time to prune is during the winter. However, blueberries can be pruned immediately after fruit harvest. Pruning established plants requires cutting out or cutting back old canes that have little strong new wood and also eliminating twiggy growth in the top and outer areas of the bushes.

Trailing blackberries (dewberries) are trained on a wire trellis. Distribute canes on the trellis by tying and by lifting and drooping canes over the wires. Remove all old canes soon after harvest. The semi-erect type of blackberry does not require trellising, but all old canes should be removed after harvest. Shorten branches sufficiently to prevent excessive drooping and thus avoid production of a high proportion of the crop near the ground.

For more detailed information on this topic, see *Pruning and Training Deciduous Fruit Trees for the Dooryard*, EDIS Publication HS82, http://edis.ifas.ufl.edu/MG345.

Fruit Maturity and Harvesting

Most tree, bush, and vine fruits are soft when mature and require careful harvesting and handling. The fruits ripen over a period of time and require periodic harvesting to obtain full quality, avoid fruit drop, prevent build-up of insects and diseases, and reduce bird damage.

Peach and nectarine. Peaches are harvested commercially just prior to softening on the tree. Unlike plums and pears, peaches do not ripen well in storage. Fruit color is not a good indicator of peach maturity since some cultivars are highly colored well before they are mature. For home use, a much higher quality is obtained when fruit is harvested tree-ripe (when the fruit begins to soften slightly).

Non-melting peaches and nectarines can be picked at physiological maturity while still firm.

Plum. Most cultivars of plums can be harvested before full tree ripening or fruit softening occurs and still ripen. Plums may also be harvested when fully ripe.

Pear. The "hard" pears grown in the South are harvested when they reach full size and ground color begins to yellow. If pear varieties that soften are harvested firm and stored at room temperature, the fruit ripens more quickly and evenly. When left on the tree to full maturity, soft flesh pears break down internally and are of poor quality.

Persimmon. The Oriental or Japanese persimmon usually turns from a yellowish-orange to an orange color with a reddish tinge when soft mature. The fruit should be picked when fully mature and allowed to soften in storage. 'Fuyu' may be used in salads while still firm because it is non-astringent, but 'Tanenashi' and other astringent cultivars should not be eaten until soft.

Fig. For fresh use, pick figs as soon as they ripen; for preserving, pick before the figs fully ripen. This practice will reduce loss from fruit splitting and souring, and the fruit picked for preserving before it is fully ripe will hold together better when cooked. Leave stem attached to the fruit.

Pecan. Pecans are harvested when mature, between October and January. Nuts are mature when the shuck splits. Pecans may be threshed with bamboo poles to remove the nuts, rather than letting them fall naturally. Threshing as soon as most of the shucks have split reduces loss from squirrels and crows. Freshly harvested nuts should be placed in dry storage for several weeks before eating. Shelled nuts may be stored in polyethylene bags, either in the refrigerator or freezer.

Chestnut. Chestnuts are fully mature when the bur splits. Gather the nuts frequently and refrigerate immediately to maintain quality. Chestnuts are subject to decay and also will dry out without refrigeration.

Blueberry. The harvest period usually begins in April and continues through July, depending on cultivar. The fruit of most cultivars begins to turn blue about three to five days before the fruit is of best eating quality.

Blackberry. Harvest extends from mid-March to early May, depending on the cultivar and year. Blackberries are dark when ripe. Berries that are reddish in color should be left for later picking unless they are to be used for jelly, in which case a portion of slightly immature fruit is desirable.

Grape. Mature muscadine grapes are bronze or black, depending on the cultivar, and are usually harvested in August and September. Bunch grapes are normally green, red, or reddish black when ripe, depending on the cultivars. Bunch grapes are harvested in July and August. Harvested fruit rapidly lose moisture, aroma, and general quality, so refrigerate and use them as soon as possible.

Apple. Apples ripen satisfactorily on the tree. Apples should be picked when they have reached optimum size and color, but before they soften. Immature fruit placed in a refrigerator will not ripen with satisfactory quality. However, ripe fruit will store in refrigeration satisfactorily for six to eight weeks.

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Other Sources

Many other circulars, fact sheets and "for sale" publications and computer programs on specific crops are available through your County Extension Agent.