Growing Fruit in Fort Bend County

Who are the Master Gardeners?

The Master Gardener Program is a volunteer development program offered by Texas A&M AgriLife Extension Service and is designed to increase the availability of horticultural information and improve the quality of life through horticultural projects.

Fort Bend County Master Gardeners are members of the local community who take an active interest in their lawns, trees, vegetables, shrubs, flowers and gardens. They are enthusiastic, willing to learn and to help others, and able to communicate with diverse groups of people.

What really sets Master Gardeners apart from other home gardeners is their special training in horticulture. In exchange for their training, persons who become Master Gardeners contribute time as volunteers, working through their Extension office to provide research-backed horticultural-related information to their communities.

Fort Bend County Master Gardeners, Inc., is a 501(c)(3) non-profit organization.

Contact Fort Bend County Master Gardener Hotline

with all of your gardening questions!

Call or email with photos and questions about:

- plant problems
- insect concerns
- grass issues or
- other gardening challenges

Email: FortBendmg@ag.tamu.edu

Phone: 281-341-7068 | Website: fbmg.org

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Temperate Fruit Trees and Vines

Temperate fruits are classified by their growth habit as tree fruits. These include apple, pear, peach and vine fruits such as grape and kiwi. Strawberry, raspberry, currant, and blueberry are classified as “small fruits” due to the size of the plant and not necessarily the fruit.

Climate is the most significant variable affecting production

Trees need low temperatures to break dormancy.

Varieties of different species of fruit trees can require different chilling requirements.

Some varieties of all fruit trees are better adapted to our local temperatures than others.

Fruit buds develop in the summer

As winter approaches, these buds go dormant in response to both shorter day lengths and cooler temperatures. Once buds have entered dormancy, they can tolerant temperatures below freezing. The buds remain dormant until they have accumulated sufficient chilling hours of cold weather. When enough chilling accumulates, the buds are ready to grow in response to warm temperatures.

If the trees do not receive sufficient chilling during winter, trees will develop one or more of these physiological symptoms:

- Delayed foliation
- Reduced fruit set
- Reduced fruit quality

Recommendations

Recommended Planting Distances, Time to Fruit,
Pollination Requirements, and Pruning Systems
For Texas Fruit Crops

	Spacing between plants	Years to first fruit	Pollination requirements	Pruning systems
Apples				
Seedlings	25 ft.	5	Cross[1]	Central leader
Root stock	10-20 ft.	3-4	Cross	
Apricots	18 ft.	4	Self[2]	Open center
Blackberries	3 ft.	1	Self	Remove old canes and top new canes
Citrus	20-25 ft.	2-3	Most self	Maintenance
Figs	12 ft.	2	Self	Bush or central leader
Grapes, bunch	4-8 ft.	2-3	Self	Cane or spur
Grapes, Muscadines	10-20 ft.	2-3	Self and cross	Spur
Peaches	18 ft.	3	Self	Open center
Pears	25 ft.	5	Cross	Central leader
Pecans	40 ft.	4-7	Cross	Central leader
Plums	18 ft.	3	Cross	Open center

[1]Cross: At least two different varieties needed for fruiting
[2]Self: Self-fruitful

Information sources for this publication:

- Dave Wilson Nursery
- Brazos Citrus Nursery
- http://aggie-horticulture.tamu.edu/galveston/publications/AmbrosiaInside.pdf
- http://aggie-horticulture.tamu.edu
- Urban Harvest

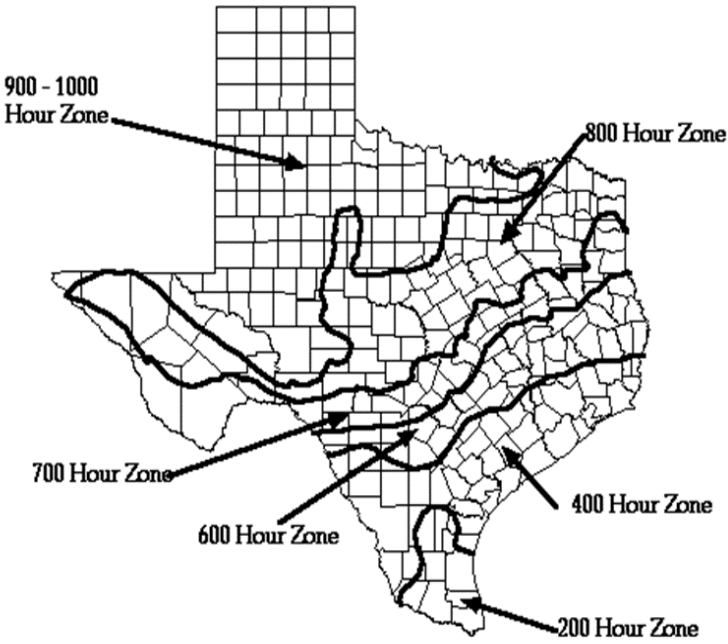
Chill Hours

The dormant buds of many plants require a period of cold weather in order to grow, flower, and develop properly, but requirements vary widely by species and varieties. For dormant buds of fruit trees, this is commonly referred to as the chilling requirement. Chill hours are used as a tool for fruit producers to gauge whether their crop has been exposed to cold temperatures for a long enough time period. The calculation is based on high and low temperatures during winter dormancy months.

Fort Bend and Harris Counties average 400-600 chill hours.

The Gulf and Bay areas average <300 chill hours.

Counties north of Harris average 600+ chill hours.



Fertilizing Schedule

Application of fertilizer (salts) to any newly planted trees can compromise their establishment. Trees should demonstrate new leaf and shoot growth before applying any fertilizer. Fertilize using the sweetheart schedule: **Valentine's Day, Mother's Day, and Father's Day**. Scatter fertilizer on the ground at least a foot from the tree trunk and promptly water it in thoroughly.

Nitrogen is usually the only element required in most Texas soils, but additional elements should not do any harm. Available fertilizers may vary in terms of the percentage of nitrogen, but the following is a general rule regarding the quantity to apply:

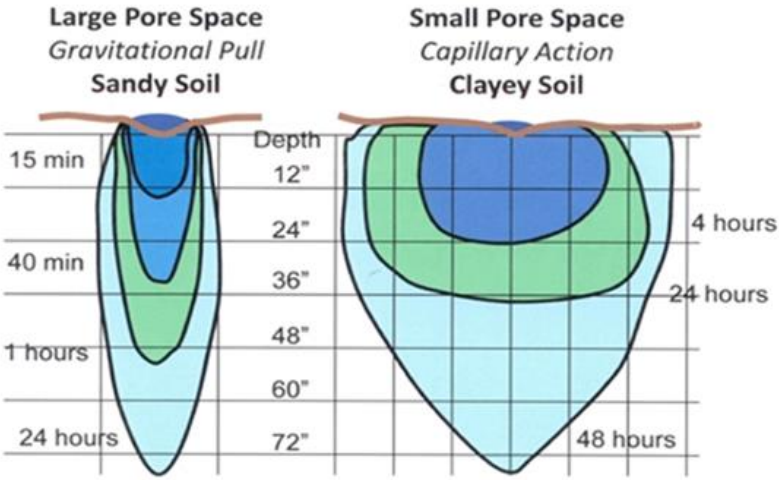
Amount of fertilizer/tree,

	Nitrogen content	
	8-13 percent	17-21 percent
First year	1 cup	1/2 cup
Second year	2 cups	1 cup
Third year	4 cups	2 cups

A good general recommendation for rate to use per tree is one pound of fertilizer per inch trunk diameter. Use 21-0-0 or ammonium sulfate if your soil pH is above 7.0. A complete fertilizer such as 15-5-10 can be used if your soil pH is below 7.0 If additional applications are made, use only nitrogen fertilizer.

Watering Schedule

Newly planted fruit trees require thorough watering two to three times the first week and one to two times per week for the next few weeks, depending upon soil type, rainfall and time of year. Then, apply water when the soil begins to get dry an inch or so down. By building a berm of soil around the planting hole, you can simply fill the water ring each time. The watering ring should erode over time (4 to 6 months), at which time the tree can be considered established and watered as needed by soaker hose or sprinkler system.



Did you know...

Most of the fruit trees grown in North America today are not originally from here. Apples come from the Caucasus Mountains that run through Europe and Asia. Apples were brought to America in Colonial times, and originally used mainly to produce hard cider. Pears are native to Europe, the Near East and temperate Asia.

Temperate Fruit Tree Root Stocks

Calleryana for flowering pears and Asian pears. Preferred rootstock for warm winter/hot summer climates and for sandy soils. Also adapted to wet soils. Slightly dwarfed Asian Pear varieties bear heavily at a young age.

Citation will dwarf peaches and nectarines to 8 to 14 feet. Apricots and plums dwarfed to 3/4 of standard. Tolerant of wet soil, induces early dormancy in dry soil. Very winter hardy. Resists root-knot nematodes. Trees bear at a young age. (Zaiger)

Lovell is more tolerant of wet soils. Also more cold hardy. Susceptible to nematodes in sandy soils. For plums, peaches, nectarines, apricots.

M-111 is an excellent all-around root stock for apples. Induces early and heavy bearing. Tolerates wet soil, dry soil and poor soil. Resists woolly apple aphids and collar rot. Trees dwarfed to 85% of standard.

M-7 dwarfs to 65% of standard. Induces early and heavy bearing. Resistant to fireblight and powdery mildew. Moderately resistant to collar rot. Good anchorage. Very winter hardy, widely adapted. Disadvantage: prone to suckering.

Nemaguard is a standard root stock for nectarines, peaches, apricots, plums, prunes, almonds. Vigorous. Resists root-knot nematode. Excellent for well drained soils. In heavy or poorly drained soil, plant on mound or hill. May not be winter hardy below 5°F. Unpruned tree height of standard varieties 15-25 ft., size can be controlled further with summer pruning.

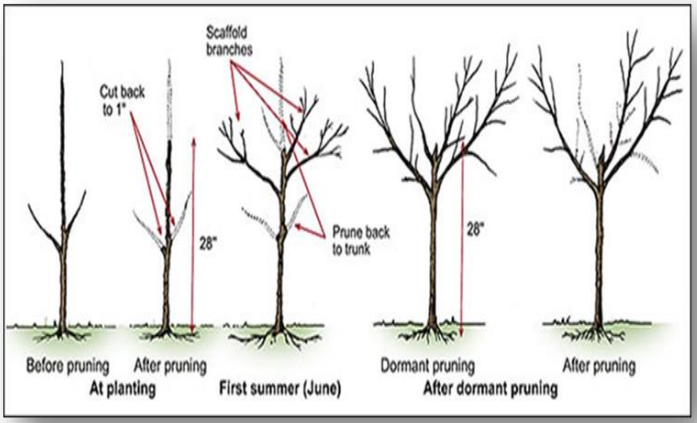
OHxF333 will dwarf European and Asian pears to about 2/3 the size of standard, or about 12-15 ft. Widely adapted, disease-resistant.

Temperate Fruit Tree Planting Tips

- Keep trees sufficiently watered until planting time.
- Remove from container and plant as soon as possible to prevent the occurrence of root circling in the container.
- Trim away any broken or circling roots before planting.
- Plant in ground only if site has been tested to drain well. Otherwise, plant on a mound of soil or in a raised bed
- Dig a hole large enough to hold the roots but shallow enough to have a firm bottom.
- Plant tree so that first lateral roots are just under the soil line when planting is finished.
- Refill with the soil you removed, water well. Build a watering ring slightly wider than the planting hole.
- Remove all grass 18” from around tree trunk.
- Mulch after planting, but keep the mulch pulled several inches away from the trunk.
- Remove any blooms or fruit when the tree is planted to ensure a stronger tree in the long run.
- If your tree requires an open vase or bowl prune for production, remove all but 18”-24” of trunk.
- You may need to water daily with sandy soil and 3-5 times a week for clay soil.

Pruning of Temperate Trees

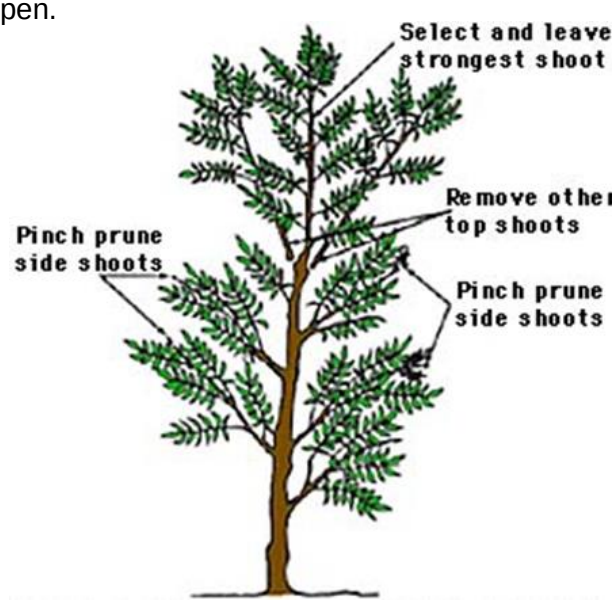
The two most commonly used tree training systems are the open center and the central leader. Open center are generally used on peaches, plums, and apricots. Apples, pears, pecans and persimmons are normally trained to a central leader. There are good and bad points to both systems, but neither system dictates that the trees be pruned a certain way. In fact, many trees are not pruned or trained at all. However, contrary to some popular beliefs, pruning is important for producing most fruit and nut crops. But don't get bogged down in specifics; instead, keep general principles in mind.



The open center or vase system of training simply involves maintaining a framework of branches around an open "vase" in the middle of the tree. This allows sunlight to penetrate all parts of the tree, allowing for good production in all areas.

Managing Fruit Trees In The Home Landscape, Aggie Horticulture

The key to open system training is to develop a strong open center framework in the first 2 or 3 years and to subsequently maintain this shape. This later pruning involves the heading-back of shoot terminals to outward-growing branches, the removal of large, fast-growing branches that fill the open center and the removal of crowded branches and any diseased or broken limbs. This reduces the height and keeps the center of the tree open.



The central leader system consists of a central trunk around which scaffolds (primarily side branches) of the desired number and spacing can be arranged with wide-angle crotches. Three to eight scaffold branches are commonly developed from the central leader trunk.

A "modified" central leader tree is cut back each winter and a new central leader shoot is selected each spring. Pecans, apples and pears are generally pruned in this manner. The top center of modified central leader trees is often thinned out for better light penetration into the interior of the tree canopy. Uniformly space the scaffolds around the central leader.

Tropical and Semi-tropical Fruits

Growing tropical and semi-tropical fruits in Fort Bend County is hindered only by our infrequent but killing freezes. For this reason it is recommended that all tropical and some semi-tropical fruit trees should be grown as containerized plants or in a greenhouse or other protective covering.

Fruits, such as citrus, avocado, mango, banana, and papaya, are extremely sensitive to cold weather. Of these fruits, citrus has a greater range of cold-hardiness, with some varieties capable of surviving temperatures in the high teens.

Mango and papaya are extremely cold-sensitive, with extensive damage occurring at freezing temperatures. Because of this they are limited to greenhouses or protective enclosures during winter and early spring. Mango fails to flower or set fruit at temperatures below 40°F during bloom formation.

Bananas freeze readily, but the underground portions survive most winters and regenerate plants the following spring. To bear fruit though, bananas require a frost-free winter.

Papaya can be severely debilitated by virus diseases. However, there are no major insect or disease problems with most of the tropical fruits in Fort Bend County.

The major disease of citrus and other tropical trees is root rot, which can kill the tree. For this reason, it is recommended that all tropical and semi-tropical trees, if not planted in a container, be planted on a mound of soil or in a raised bed.

Cold Hardiness

Cold hardiness in semi-tropical and tropical fruits is an important consideration when selecting your planting site. Semi-tropical fruits, such as figs, satsumas, kumquats, and bananas adapt well to our hot summers and can take some frosts. But tropical fruits such as limes, lemons, mangos, and avocados usually do not perform well when the temperate drops to below 40°F.

Satsumas and other semi-tropical fruit trees gain in cold hardiness as they mature. A mature avocado tree can withstand damage when temperatures reach 22°F but will need protection from temperatures below 40°F when less than 5 years old.

There are several factors affecting the cold hardiness of trees beyond temperature. Several of the most important are:

- Was the plant hardened off or conditioned before the freeze?
- How long was the temperature below freezing?
- Age of the plant?
- Health of the plant?
- How windy was the freeze event?
- Was the plant laden with fruit or not?

Trees planted in containers should always be removed to a protected site when freezing weather threatens. If the tree is planted in the ground, remember to remove all mulch so the tree is surrounded by bare ground. Water the tree well and provide some covering for protection.

Tropical and Semi-tropical Planting Tips

Young trees can be susceptible to frost and freeze damage so trees that are purchased in the fall or winter should be kept in their pots and protected until all danger of freezing temperatures has passed.

Plant in an area that receives at least a half day of full sun. The more sun the tree receives each day, the better the production.

When possible, plant trees on the south side of a house, fence or building where they may get protection from winter winds.

If planting in the ground, remember to plant on a mound of soil or in a raised bed. Wet clay soil is a killer.

Trim away any broken or circling roots before planting.

Plant in ground only if site has been tested to drain well. Otherwise, plant on a mound of soil or in a raised bed

Dig a hole large enough to hold the roots but shallow enough to have a firm bottom.

Plant tree so that first lateral roots are just under the soil line when planting is finished.

Refill with the soil you removed, water well. Build a watering ring of leftover soil slightly wider than the planting hole.

Remove all grass 18” from around tree trunk.

Mulch after planting, but keep the mulch pulled several inches away from the trunk.

Remove any blooms or fruit when the tree is planted to ensure a stronger tree in the long run.

Avocado Care

For their first few years, avocados need protection from winter cold and from extended hours in direct sun. This process is made easier by keeping avocados as container plants.

Protection from the sun:

Avocado trees have almost no brown, woody bark as immature trees. The main branches and stems are bright green and help photosynthesize to provide food and energy for your tree, just like the leaves. This green tissue is very susceptible to sunburn. Young trees do not have enough leaves to shade this bark and require special care during the first year or two.

One option is to paint the green trunk and main branches with a whitewash of 50% water and 50% white, latex paint.

Do not paint the leaves. Reapply as needed.

Another option is to build a simple structure of metal, wood, or PVC to which a cloth can be attached that will keep the mid-day and afternoon sun off the trunk. This will aid in shade and wind protection.

In two to three years bark will form and the tree can safely be planted.

Avocados must be planted where they have good drainage, which is preferably on a berm or in a raised bed.

Avocados ripen after harvest.

Citrus Root Stock

Trifoliate Orange root stock is well adapted to heavy, poorly drained soils and is extremely cold hardy and drought tolerant once established. It's a great rootstock for the Houston/Gulf Coast area.

'**Rubidoux' Trifoliate Orange** root stock is a somewhat dwarfing form of Trifoliate orange. It will dwarf the scion 10-20%. Resistance to gummosis and root rot. Adapted to loam, sandy loam and clay soil.

'Flying Dragon' Trifoliate Orange root stock is the dwarfing form of Trifoliate orange. It has all the same qualities of Trifoliate orange except that citrus grafted onto it averages only 6'-8' in height. It is great for a small garden, in a container, or useful in high density plantings. Very cold hardy.

Carrizo and West Indies root stocks are more tolerant of soil salinity, but less tolerant of cold temperatures. Trees on Carrizo are nematode resistant, faster growing, and produce higher yields and larger fruit.

Volkameriana is a Rangpur type, but with characteristics similar to Rough Lemon. It is of Italian origin and thought to be a variant of a mandarin lime and is also known as 'Volkamer Lemon'. It has good vigor, drought tolerance and produces a larger tree with higher production than sour orange rootstock. It is salt tolerant.

Did you know citrus trees are host plants for the giant swallowtail caterpillar?

Fertilizing Schedule

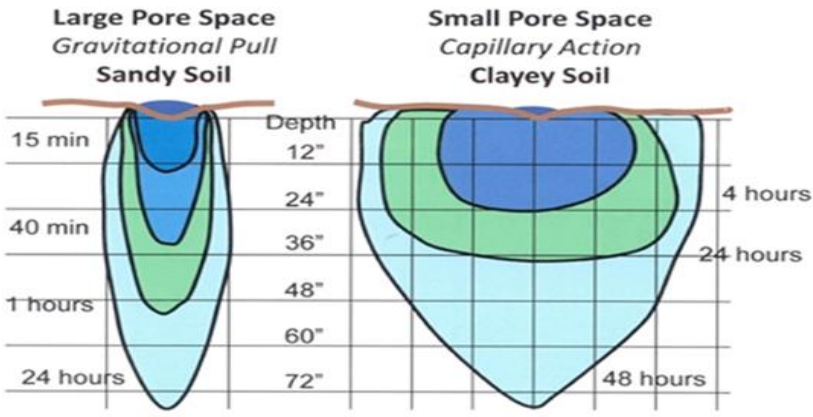
Before applying any fertilizer to a tropical or semi-tropical tree, it is recommended to learn the tree's particular nutritional needs.

A good general recommendation for rate per tree is one pound of fertilizer per inch trunk diameter. Use 21-0-0 or ammonium sulfate if your soil pH is above 7.0. A complete fertilizer such as 15-5-10 can be used if your soil pH is below 7.0 If additional applications are made, use only nitrogen fertilizer.

Remember, application of fertilizer (salts) to any newly planted trees can compromise their establishment. Trees should demonstrate new leaf and shoot growth before applying any fertilizer.

Watering Schedule

Newly planted trees require thorough watering when planted. Depending upon soil type, rainfall and time of year, the regular watering will depend on the type of tree. Most prefer infrequent deep watering. Apply water when the soil begins to get dry an inch or so down. The purchase of a moisture meter will help in determining when the soil is dry. After the tree is established, water as needed by soaker hose or sprinkler system.



Pruning Tropical and Semi-tropical Trees

Prune trees when they are dormant or not growing which is usually in the winter. Summer pruning removes leaves (food manufacturer), slows fruit ripening, and exposes fruit to sunburn. Summer pruning can be used, however, to slow down overly vigorous trees or trees that are too large. It is most effective after harvest.

Low vigor, young trees should be pruned by one-third and encouraged to grow rapidly for the first 3 years without much fruit. Leave most of the small horizontal branches untouched for later fruiting. Vigorous growing, young trees can be pruned much less or not at all and encouraged to fruit earlier with branch bending.

Upright branches generally remain vegetative and vigorous. Horizontal branches generally are more fruitful. A good combination of the two is necessary for fruiting now and in future years. Branches bent to 45° to 60° angles achieves this balance.

Remove diseased, crossing or broken branches. Remove suckers, water sprouts and most competing branches growing straight up into the tree. Downward bending branches (beyond 90°) eventually lose vigor and produce only a few small fruits; cut off the part hanging down.

Sun exposed wood remains fruitful and produces the largest fruit. Shaded branches eventually stop fruiting and will never produce again without drastic topping and renewal of the entire tree. Do most of the pruning in the top of the tree so that the lower branches are exposed to sunlight.

Make clean cuts (within ¼") of a bud; don't leave stubs. Always prune to an outward facing bud.

Growing Fruit Trees in Containers

If choosing to grow your fruit tree in a container rest assured, it's easy to do provided that a few suggestions are followed.

Choose a container

When choosing a container,15 gallons is the maximum you need. If the container does not drain well, ensure adequate drainage by drilling more holes on the sides and bottom. No need to jump into a 15 gallon pot to start, so move up slowly; a few gallons every year. The use of black plastic pots will increase the need to water.

Choose the soil

Invest in a well-drained potting soil or soil-less mix. Use a slow-release fertilizer such as Osmocote. This slow-release fertilizer application should be applied as directed on the label beginning in the spring (March). Watering is gauged by plant size and temperature.

Choose the site

Locate your tree so it gets 6-10 hours of direct sun daily preferably with morning sun and some afternoon shade.

Root pruning

Every 3 - 4 years, trees will outgrow their containers. This is usually signaled by leaf shed or browning and twig dieback which is not related to drought stress. You have two choices: Move the tree to a larger container, or lift the plant out, prune the roots and put it back in the same container. If using the same container, lay the container on its side and slide out the plant, cut about a quarter of the roots or about 2 - 3 inches off, return to the container and add new soil where needed keeping the tree raised to the same height. Prune at least a third of the foliage.

Pest Control and the Homeowner

Homeowner do's

- Be able to recognize the pest and be familiar with their damage.
- Be able to recognize beneficial insects which help control pest.
- Inspect your orchard frequently.
- Keep your trees in a healthy, vigorous state. Healthy plants can withstand insect attacks much better than weak plants.

Homeowner don'ts

- Do not allow pests to build up high numbers.
- Do not allow plants to suffer from too much or lack of water or fertilizer.
- Do not use herbicides in your home orchard unless you fully understand all aspects of safe handling and application.
- Be careful if using a systemic weed and grass herbicide. It can kill fruit trees and berry canes if there is contact with leaves or green bark. Spray drift as well as direct spray contact is dangerous. Apply contact herbicides when there is no wind and shield small plants from potential spray drift.
- Stay well away from fruit and nut trees with selective lawn herbicides (weed and feed) that contain 2,4-D. This hormonal-type herbicide kills broad-leaved weeds without injury to grasses. Slight spray drift or 2,4-D residue in the lawn can seriously damage or kill trees and berries. Grapes are especially vulnerable to 2,4-D.
- If you do not fully understand safety and application procedures, you should not use any herbicide.

Pesticide Formulations

Several pesticide formulations are available for the home orchard use. At certain times one formulation may be better than another. The choice of formulation depends upon your personal preference, convenience, the equipment available and, at times, the pest that must be controlled. Before using any pesticide, make sure your target pest and tree are listed on the label.

Dusts are ready to use and require no dilution or mixing. They are easily applied and are most effective when used thoroughly but sparingly. Dusts cannot be mixed with water.

Soluble powders and wettable powders are purchased as concentrates. They are to be diluted before use by mixing with water. Do not use them as dusts as this may damage plants.

Emulsifiable concentrates are liquid formulations which are to be diluted with water to obtain the desired concentration for treating plants.

Granules are dry, granulated materials that come ready to use. Spread them on the surface or work into the top 2 to 3 inches of soil.

Baits contain a desired food of the pest in addition to a toxic substance. When the pest eats the bait, the pest ingests enough toxicant to kill it. Baits are applied to areas that pests frequent.

Common Pests

All sucking and chewing pest numbers rise and fall throughout the year based on environmental conditions, available host plants and populations of predator insects.

At times, the number of pests can cause us to temporarily intervene to protect our plants.

What to Do

At the first sign of pests, spray the undersides and tops of leaves with a strong stream of water to knock the pests from the plant.

If there are numerous pests still on the plant you can apply 1 tablespoon of dish soap to 1 gallon of water in a hose-end sprayer. Spray leaves to dripping, top and bottom.

If you are still seeing too many pests, apply an insecticidal soap to the leaves following the label directions. But remember that insecticidal soup will kill both harmful and beneficial insects.

—You can also spray with neem, dormant oil and/or Spinosad to smother any crawling insects, nymphs or larva.

Control any ants, if present, since ants will farm pests.

Avoid resorting to the use of chemical insecticides until you've exhausted the strategies above and there is economic loss on your part, such as the desired plant declining or dying.

Aphids, Small, soft-bodied. Can be pale green, pink, black, yellow, winged or wingless

Aphids farmed by imported fire ants

Whitefly, lay eggs underneath leaf, eggs hatch into semi-transparent tiny larva resembling aphids

Scale, small bumbs attached to stem, twigs and leaves. Nymphs look like aphids. Females have protective shells.

Spidermites form dense colonies under leaves. Symptoms are stippling and silvering.

Photo: USDA Cooperative Extension Slide Series, Bugwood.org

Sooty Mold, a fungi that grows on honeydew excreted by sucking pests. Turns leaves black, weakens plants.

Leaf miner

Leaf miners damage succulent new growth but avoid tougher, mature leaves. These pests are a nuisance for mature trees, and do not usually affect the overall health. Newly planted trees (under 3 years old), in active growth, can be threatened due to reduced active leaf area. Efforts to protect young trees are recommended.

Leaf miners have several natural enemies. These can build up to the point they maintain leaf miner populations at acceptably low levels. The use of broad-spectrum products such as malathion, carbaryl, and pyrethroids are not recommended for leaf miner control since they also kill beneficial insects and can result in a buildup of whiteflies, scale insects, and other pests.

What to Do

Apply horticultural oil or Neem in spring when a new flush of growth appears.

Repeat every 7-10 days until the leaves reach full size and become firmer. Spray both sides of leaf to dripping. Stop oil applications when temperatures reach the mid 80's to avoid sunscald of leaves.

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Leaf miner continued...

Spinosad is a low toxicity option and can be used any time in the season. Spray when new growth emerges and the first signs of leaf miner damage is found, repeat every 7-14 days.

Borers

Borers are young moths that hatch out as larvae on the base or canopy of a stressed tree trunk. They bore their way inside and live there, eating the inner wood, until the following spring. Peachtree borers attack stone fruit trees, leaving holes in the trunk oozing a jellylike sap substance.

What to Do

Stressed, unhealthy trees are attacked repeatedly and will need repeated applications of insecticide indefinitely.

This is neither economical nor environmentally justified.

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Borers continued...

Treatment begins early in spring even before larvae become active. Probe small holes in trunks near the soil line, especially those with evidence of frass, with the point of a knife or stiff wire to crush larvae (and later pupae) beneath the bark.

This photo shows both borer and sapsucker damage. Sapsucker is in straight lines; borer holes are random.

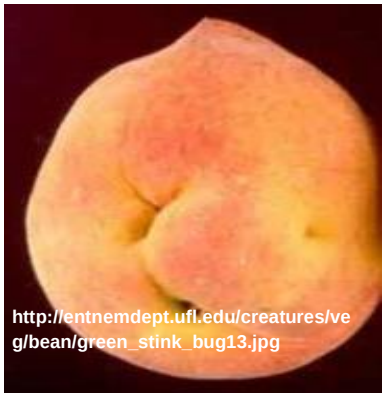
Plum curculio

A persistent pest of peaches and plums; the adult is a weevil. Females bite the fruit then lay eggs, the larvae moves toward the seed and feeds on developing fruit. Small fruit falls from the tree, larger fruit are ruined by the feeding of larvae inside.

Catfacing

The fruit is deformed and pitted, caused by insects feeding on the growing fruit.

Look for stink bugs, leaf-footed bugs, green June beetles and others.



What to Do

Control with insecticides:

When petals begin to fall off.

Apply additional applications at the shuck split stage.

At 2-week intervals to include three more applications.

Cultural practices:

Sanitation, pick up all fallen fruit, remove all mummified fruit from the tree.

Proper thinning of fruit, fruit grown too close together creates a breeding space for bacterium and fungi.

Mites

Mites feed primarily on leaves and can cause significant stippling and leaf drop. Additionally Citrus Mites feed on fruit skin causing a rusty or sanded look. Significant or repeated leaf drop can lead to fruit drop. Leaf drop can result in sunburning of fruit, dropped fruit, and reduced photosynthesis. Warm fall temperatures will allow mites to thrive in the home orchard.

What to do

Mites are difficult to control.

Spray trees with a strong stream of water twice a week during periods of peak mite activity.

Control with insecticidal/miticidal oils and soaps thoroughly cover upper and lower leaf surfaces.


Photo: Texas A&M AgriLife Extension

Mites are usually not killed by regular insecticides, so be sure to check the pesticide label to see if the designation "miticide" is present.

Oils should not be applied when soil moisture is low or relative humidity is below 30 percent and daytime temperatures are likely to exceed 95°F.

Effective use of oils requires the oil remain on the tree long enough to smother the pest but not long enough to cause tree injury.

Residual oil film on foliage, beyond the tree's tolerance, can interfere with photosynthesis and transpiration.

Damage can result in twig dieback, leaf drop, reduced yield and the reduction in amount of fruit sugars.

Common Diseases

The Disease Process

Plant diseases develop when three things occur at the same time; the disease causing pathogen, the right environment, and an entry way into a host plant. Decreasing or eliminating any of these three components can reduce the severity of the disease. Some of the bacterial and fungal diseases that afflict fruit trees in our area start to grow and spread in the spring when rain showers and temperatures create the perfect incubator, spreading bacterial cells and fungal spores to receptive new leaves and flowers (examples: fire blight, scab). Insect pests, and environmental stresses like wind, hail, sun, or excessive rain can provide pathogens an opportunity to infect the tree through openings in tree bark, leaf and fruit tissues.

How it Spreads

Disease-causing organisms are blown by wind from diseased trees or plant parts to nearby healthy plants.

Brown rot of peaches, black rot of grapes and scab of pecans are spread by spores carried by air currents.

Pathogens can also be spread mechanically during pruning, thinning, irrigating or cultivating.

Equipment used during lawn maintenance can also injure the roots and limbs of the trees. These injuries create wounds through which disease-causing pathogens can enter.

Selection of Varieties & Rootstocks

Select disease-resistant fruit tree varieties/rootstocks for your growing conditions. Also, buy certified virus-free trees from reputable nurseries.

Common Diseases

Canker Disease

Canker resembles a blister or canker sore on the tree's bark, leaf or branch.

Canker caused by an open wound on a tree's branch or trunk can be infected with one of dozens of bacteria or fungus of numerous classifications on trees that are stressed.

Symptoms vary, but typically occur in the spring when infected buds fail to bloom and leaf emergence is delayed, uninfected parts of a branch bloom normally, but then die.

Canker can also cause leaf spots. These small spots begin as a dark purple color, die out then develop a shot hole appearance.

What to Do

Prune correctly allowing cuts to heal.

Keep plants healthy. Treat stress and watch for freeze damage

Prune out the diseased plant parts and destroy the wood.

Apply a fungicide.

Image courtesy of Division of Plant Industry, Florida Department of Agriculture and Consumer Services

Leaf Symptoms

Fungal leaf spots will cause defoliation and fruit blemishes.

Bacterial leaf disease is characterized by leaves that turn yellow only in one section of a tree.

Powdery mildew

All vegetation in the right conditions can be attacked by powdery mildew disease. It is a white or gray powdery growth resembling talcum powder on leaves. Common in warm, dry climates, it favors low humidity, grows at 90°F.

Cercospora leaf spot

Cercospora is a leaf spot fungi that is soil borne. The disease begins growing in early spring with warm, wet weather. By late summer, spots form on the oldest leaves sometimes causing premature leaf drop. This fungi prefers sheltered, airless areas that stay wet.

Bacterial leaf spot

This bacterium begins growth with warm, wet weather. It forms irregular spots with yellow halos. Lesions rarely develop on new leaves preferring mature ones. The bacterium overwinters on the tree and in the soil.

What to do

Provide air circulation and reduce water. Dip irrigation is recommended since overhead watering will splash the pathogen onto the plant. Remove all fallen leaves and old mulch. Apply a new layer of mulch.

Spraying with copper will not kill the pathogen but may prevent it from germinating.

Fireblight

Symptoms of fire blight can appear on flowers, buds, shoots, leaves, and mature stems and branches. Infected tissue eventually turns black. Leaves will eventually shrivel and die while remaining on the tree. Shoots turn black and curl giving a ‘Shepherd’s Crook’ appearance. Infected branches appear water soaked. The underlying wood will become discolored. Stems can exude an amber colored bacterial ooze.

Rapidly growing trees (apple, pear) are especially vulnerable so avoiding excess nitrogen and heavy pruning during early spring can help lower the risk of Fireblight. The best deterrent is to choose tolerant or resistant varieties of trees.

What to do

Dip shears in 10% bleach between cuts but location of cut is far more important than the cleansing of tools.

Cut an infected branch 8 to 12 inches below the visible injury or canker. Or find the lower edge of visible infection on branch, trace branch back to point of attachment, cut at next branch juncture.

Best done in winter when trees are dormant and bacteria aren't active in the tree.

Don't apply any dressing to the wound.

A weak (0.5%) Bordeaux mixture or other copper fungicide applied several times as blossoms open can reduce new infections, but will not eliminate all new infections or those already existing in wood.

Brown Rot

Can infect fruit, shoot or flowers.

Causes blossom blight, stem canker, brown rot and mummies .

Survives winters as fruit mummies or in the canker.

Favors warm temperatures, high humidity and rain.

Spores are dispersed by rain and overhead irrigation.

What to Do

Cultural practice:

Practice good sanitation — remove all dropped or diseased fruit.

Prune out and remove any cankers and destroy infected twigs and branches.

Remove and destroy all mummified fruit in and around the tree.

Prune to avoid excessive overcrowding of branches to improve air circulation.

Control insects that could wound and injure fruit.

Use moderate amounts of nitrogen fertilizer.

Chemical control:

Apply fungicides during the blossoming period at early pink bud, full bloom, and/or petal fall to control the blossom blight phase.

Adapted from, Brown Rot in Peaches, Camille Goodwin, MG 2008,Texas AgriLife Extension Service, Galveston County Office

Root Symptoms

Phytophthora is a pathogen found in all soils throughout the world causing foot rot, root rot, brown rot, or gummosis. As with all diseases, susceptibility depends on the presence of favorable soil, water and environmental conditions. The pathogen requires extremely wet soils in order to infect and cause significant damage. Foot rot or gummosis occurs when the spores are splashed onto a wound or bark crack.

Symptoms of rot

Leaf - yellow foliage and twig dieback.

Fruit - reduced fruit size and yield.

Trunk - infections result in dark water-soaked areas, usually on the bark or at bud union. Lesions may exude sap with a brown sunken area under the bark. Dead bark tends to break away from the trunk in vertical strips. Lesions may spread around the trunk slowly girdling the tree.

Whole tree - poor tree health, thin canopy, failure to make new growth, and wilting. Infected roots become soft, discolored and appear water-soaked. Fibrous roots slough their cortex leaving only the white thread.

Root Symptoms, cont.

What to Do

Choose the most resistant tree species.

Avoid sites that drain slowly or poorly. Raise marginal sites to provide the additional drainage.

Pears and figs are the most resistant fruit crop and are most likely to remain healthy in a relatively wet site.

Fungicides are most effective when used in combination with the cultural practices.

Mechanical wounds

When a tree is wounded, the injured tissue is not repaired and does not heal. Trees do not heal; they seal. Trees have a remarkable ability to compartmentalize which can be hampered by using wound dressings.

What to Do

Do not apply wound dressing of any kind.

Do not fill any cavity.

Prune only to facilitate a better healing, such as pruning a broken branch to the branch collar.

Healthy trees usually recover from wounding quickly. Try to keep wounded trees growing vigorously by watering them during droughts and providing proper fertilization. This will increase the rate of wound closure, enhance callus growth and improve the resistance to decay mechanisms. Healthy trees heal quicker.

Citrus Quarantines

The citrus quarantines of Fort Bend, Harris, Brazoria, Galveston, and Montgomery counties are confusing to most people. Too many boundaries, too many rules, and too many codes lead to a mishmash of misunderstandings.

It's important to understand there are two quarantines affecting our area. Additionally, it's important to remember the quarantines are in place to contain and eradicate dangerous citrus diseases threatening our commercial citrus industry. This industry is worth more than $200 million yearly to Texans. The diseases are only in private home-grower's yards at this point, so we are the frontline of containment and eradication.

How to Help Prevent these Diseases

It is important to remember there is no proven cure for these diseases, so prevention is key. We, as hobby growers, must

- Use good sanitation practices. Rake up fallen leaves, double bag and send them to the landfill.
- Do not compost leaves since the bacterium can thrive in fallen leaves.
- Avoid wounding your tree with unnecessary pruning.
- Keep machine, bird and insect damage to a minimum by spraying or using exclusion techniques.
- Check your tree often for good health.
- Limit the use of nitrogen fertilizer since this affects the amount of new growth. New growth or flush, is most susceptible to both Asian Citrus Psyllids and leafminers.
- Control Leafminer and Asian Citrus Psyllid damage.

Citrus Greening

What is it?

Citrus greening (CG) disease, or Huanglongbing (HLB), is considered to be the most destructive disease of citrus. It is endemic in large parts of Asia and Africa, and has recently invaded the Americas. The list of host plants for citrus greening (HLB) disease is extensive and includes all citrus types and all citrus varieties.

How is it spread?

It is caused by a bacterium which is transmitted by insects called Asian Citrus Psyllids (ACP). There is no cure for greening, and the lengthy latent period after infection makes eradication almost impossible.

Signs of Citrus Greening Disease

Typically, the first signs of CG will be

- Leaf yellowing on one or two branches. The leaves will develop a blotchy irregular, spotty appearance with grades of color. The leaves may also show signs of micronutrient deficiency, especially zinc and manganese.
- Fruit set will become thin, fruit will appear lopsided, may contain aborted seeds.
- Unacceptable juice quality.

What to do:

- Do not bring trees into the quarantine area that were grown in any state or county that has CG or the ACP. This would be all of the Gulf Coast States, including Florida and California.
- Do not bring in trees from Mexico.
- Do not take trees out of the quarantined area.

Citrus Canker Disease

What is it?

A serious disease where there is frequent rainfall and warm temperatures during shoot emergence and fruit development. Optimal temperature for development range from 68-86F. Disease causes leaf-spotting and fruit rind-blemishing, defoliation, dieback and fruit drop. The Asiatic form, Canker A, is the most widespread and severe form of the disease.

How does it spread?

Bacterium enters plant tissue via wounds. Water/rain causes canker to ooze, picked up by wind, blown to next tree with a wound. Leafminer gallery is most common point of entry. Affects new growth and up to 90 days after petal fall. Also transmitted by tools, hands, clothing, machinery, and by moving plants and fruit between locations.

Signs of Citrus Canker

- Brown spots (or lesions) on leaves, often with an oily or water-soaked appearance.
- Spots are usually surrounded by a yellow halo.
- Spots can be seen on both the upper and lower sides of the leaf.
- Similar symptoms can appear on fruit and stems.

What to do:

- Rake up fallen leaves, branches, twigs, and fruit. Double bag and do not compost, send to landfill (NOT green waste collection).

- Check your tree often for good health.

Report Your Tree If You Suspect It To Be Infected!

- Texas A&M AgriLife Extension – Fort Bend
  281-342-3034 http://fortbend.agrilife.org
- Fort Bend County Master Gardener **Hotline** –
  281-341-7068 Email: FortBendmg@ag.tamu.edu
- Texas Department of Agriculture…1-800-835-5832
  texasagriculture.gov
- TDA Gulf Coast Regional Office…713-921-8200

For additional information:

aggie-horticulture.tamu.edu

citrusalert.com

Links within site to: Citrus Canker, Citrus Greening
Quarantine Map, How to Report a Tree

aphis.usda.gov/aphis/home

Online Resources

For more information on varieties, planting and maintenance of your fruit and nut trees, Texas A&M AgriLife Extension Service has a number of publications available including:

Aggie Horticulture:

http://aggie-horticulture.tamu.edu

Links: Fruit & Nut Disease Control products
Fruit-Nut Propagation Plus much more

AgriLife Extension Bookstore:

http://agrilifebookstore.org/

Pruning Fruit Trees:

http://gardeningsolutions.ifas.ufl.edu/care/pruning/pruning-deciduous-fruit-trees.html

Texas Citrus Website:

http://weslaco.tamu.edu/

For additional information or to receive printed copies of a Texas A&M AgriLife Extension Service publication, please contact the Master Gardener Hotline at 281-341-7068 or FortBendMG@ag.tamu.edu.

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