



Your Florida Dooryard Citrus Guide - Young Tree Care¹

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Weeds and Mulching

Since the canopy of a young citrus tree produces very little shade and will be watered and fertilized frequently, weeds are almost certain to be a problem during the first, crucial year of tree establishment. Weed by hand frequently or with a hoe. Frequent, light weeding, especially after a good rain or regular irrigation, will do the job without damage to roots. If you use a hoe, use it carefully: working the soil too deeply with a hoe may damage fibrous feeder roots that are close to the surface.

Mulching with organic material like grass clippings, leaves, or black plastic can reduce weed growth and conserve water. If mulch is applied around your citrus trees, apply it no thicker than 3 to 6 inches to optimize root aeration. Keep all mulch at least 12 to 24 inches from the tree trunk to decrease the chance of disease problems caused by soilborne fungi splashing onto the trunk or fruit. If you cover the entire root zone area with a thick layer of mulch, you make it more difficult for fertilizer and water to penetrate the soil to reach plant roots. You then must apply sufficient water and fertilizer to satisfy the water requirements and fertilizer needs of microorganisms living in the mulch before any water

and nutrients will be available to meet the needs of your overly mulched tree.

Herbicides

Several herbicides are available at your nursery or chain store that are safe to use at low rates on young trees. Since newly planted trees are especially sensitive to herbicide damage, be sure to follow label instructions very carefully.

Routine Care

As your tree begins to grow, pinch off young sprouts that occur on the rootstock (and lower trunk of the scion) in order to stimulate growth in the canopy of the tree. When these sprouts are young and tender, they can be pinched or rubbed off easily. If they have hardened off and become woody, use pruning shears to remove them. Tearing woody sprouts off will remove strips of bark that may later predispose the young tree to insect damage and/or soil-borne fungal diseases.

Wait several weeks after planting to make the first, light fertilizer application, being careful to spread fertilizer in about a 3-foot diameter around the tree but not up against the tree trunk.

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Young trees require considerable water for survival and growth. Competition for water is accentuated if the young tree is close to older trees or if weeds are allowed to grow in the rooting zone of the plant. Anything that can be done to discourage competition for available soil moisture will be beneficial to the young tree.

Flood Tolerance

Dooryard trees may occasionally be planted in areas subject to periodic flooding, which damage citrus roots and even kill trees. Although trees on all rootstocks are eventually damaged to some degree under flooded conditions, limited observations indicate that rough lemon, Volkamer lemon, Milam and Swingle citrumelo are the most tolerant to flooding. Cleopatra mandarin, Carrizo citrange and Citrus macrophylla exhibit the least tolerance while sour orange, trifoliolate orange, and Palestine sweet lime are intermediate.

Salt Sensitivity

Citrus is generally classified as a salt-sensitive plant because relatively low levels of salinity can cause leaf damage and reduce tree vigor and yield. Salt problems result from sodium chloride and other salts present primarily in the irrigation waters used in flatwoods areas near Florida's east and west coasts. The rootstock affects salt tolerance in a citrus tree primarily by preventing the accumulation of sodium and chloride ions in leaf tissue. Cleopatra mandarin and Rangpur lime rootstock have been consistently ranked as relatively tolerant to sodium chloride and should be planted in coastal areas where salt damage occurs. Rough lemon, Swingle citrumelo, and Carrizo citrange rootstocks are sensitive while Milam and trifoliolate orange rootstocks are very sensitive. If you live in a coastal area, salt tolerance may be a higher priority than the above-mentioned factors.

Irrigation

Florida's average annual rainfall of 50 to 62 inches exceeds the 42 to 48 inches per year required for an acre of mature citrus trees. However, our seasonal rains (primarily from June to September), combined with the low water-holding characteristics of Florida's sandy citrus soils, make irrigation

necessary. In commercial groves, mature trees can use from 10 to 90 gallons of water per day, depending on environmental conditions. While these rates are not necessarily recommended for homeowners, they can be used as guidelines.

In commercial groves, current recommendations call for established, young citrus trees to be watered one to seven times per week, depending on the type of irrigation system used, time of the year, climate, geographic location, and other factors. Mature trees are irrigated from one to five times per week (Table 1 and Table 2).

For young trees, the goal of irrigating twice per week, for short durations, from March through June is to maintain optimum moisture in the upper soil layer where most of the roots are. If you have a feel for the field capacity (amount of water held after excess water has drained) of your soil, maintain approximately 65% of field capacity in the top five feet of soil during the crucial period of leaf expansion, bloom, fruit set and fruit enlargement (that occurs during Florida's dry season - January/February to June).

In other words, maintain the above soil moisture levels until fruit is greater than 1-inch in diameter. Proper irrigation during this period also affects tree size, fruit yield, size, and color, as well as juice content and quality. For the rest of the year, approximately 35% of field capacity is adequate.

The highly efficient drip and microsprinkler irrigation systems mentioned in these tables can maintain optimum soil moisture for tree growth and fruit production. Drip systems deliver 1-2 gallons per hour and microsprinkler systems deliver 5-25 gallons per hour. Modify these recommendations according to your irrigation system and landscape needs.

Soil Type

Soil type should also be considered. The finer-textured but poorly drained soils typically found along the coastal areas and flatwoods generally will hold greater amounts of water than the coarser, deeper sands found on the Ridge areas of central Florida.

The tree's rooting depth will also influence irrigation requirements. Citrus grown on well-drained sands will normally have a rooting depth of 4 to 6 feet, depending on the rootstock, with 80% of the roots in the top 3 feet of soil. Citrus grown on flatwoods soils seldom have more than 1.5 to 2 feet of rooting depth, with 98% of the roots in the top two feet of soil.

Water Management

Water management is a critical concern in Florida. In recent years, the trend in commercial citrus irrigation has been to use low-volume drip systems and microsprinkler irrigation that place water when and where it is needed for tree growth, with minimal loss due to evaporation.

Drip emitters and microsprinklers provide good coverage in most situations and use less water than many other methods of irrigation (Figure 1A;1B).

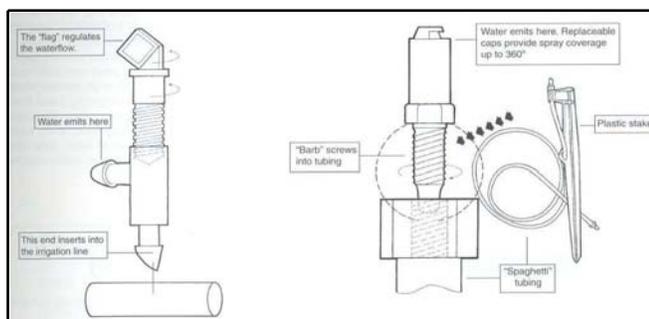


Figure 1. 1A. Drip irrigation; 1B. Microsprinkler

There are other reasons for using the newer water-delivery technologies. Traditional irrigation methods that apply water over or into the tree canopy cause salt burn on leaves if water (especially in coastal areas) with greater than 800-1000 parts per million total dissolved salts are used. Drip and microsprinkler irrigation can use water with higher salt levels (1500-2000 parts per million) without causing comparable leaf damage.

The incidence of major fungal diseases of foliage and fruit (*citrus scab* and *Alternaria brown spot*) can also be reduced by avoiding overhead irrigation that spreads fungal spores in the canopy. In recent years microsprinklers have also become widely used for cold protection.

Root Zone Coverage

Another important aspect of irrigation is coverage of the root zone. When you use drip and microsprinkler irrigation, 50-60% of the root zone should be covered to optimize fruit production. The number of emitters is therefore extremely important, especially for larger trees that may require 4 or more drippers or 2-3 microsprinklers per tree. Microsprinklers provide different spray patterns and ground coverage (Figure 2), while drippers irrigate a more limited area.

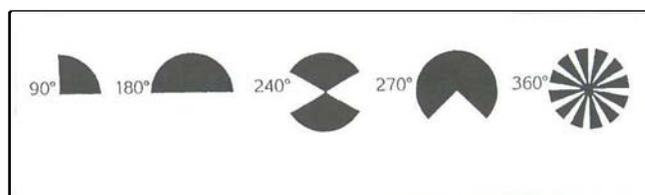


Figure 2. Typical microsprinkler coverage patterns.

Drought Tolerance

Some rootstocks are more drought-tolerant than others, but all trees must first become established before they can withstand water stress.

The characteristics of a root system adapted to drought stress are exemplified by rough lemon, a rootstock long recognized for superior adaptability to the deep sandy soils of our central Ridge. Trees on rough lemon have a wide, spreading root system, extending as much as 50 feet laterally and more than 25 feet deep in sandy soils. When the advantage of soil depth is removed (as it is for trees planted on shallow soils with a high water table like southern Florida), rough lemon is still a drought-tolerant rootstock. However, trees on rough lemon rootstock are not readily available because they are very susceptible to citrus blight – a widespread disease of unknown cause.

In contrast, trees on shallow-rooted rootstocks (Ridge pineapple, Rusk citrange, sweet orange, and trifoliate orange) are often the first to wilt during prolonged periods of drought.

Dooryard trees planted in situations where they will receive minimal care, especially during the dry spring months, should be planted on rootstocks that have good drought tolerance. (Carrizo citrange,

Citrus macrophylla, Milam lemon, Palestine sweet lime, Rangpur lime, rough lemon and Volkamer lemon). Note that these rootstocks offer little cold tolerance.

If you plan to spend only the winter months in Florida, plant your dooryard tree in the landscape as soon as you can and tend it well. Establishing a relatively drought-tolerant tree may be a higher priority for you than cold tolerance, salt tolerance or other factors.

Fertilizing

During the first few years, apply fertilizer to young trees to stimulate vigorous growth of leaves and branches that become the framework of the mature tree. Beginning about 2 weeks after planting, frequent, light applications of fertilizer should be made approximately every 6 weeks. Avoid burning roots with high levels of soluble fertilizer applied all at once.

Fertilizer should not be applied between October 1 and February 1 for the first year or two, especially in regions north of Polk county where severe cold damage has occurred. This will reduce the possibility of untimely growth flushes in the winter.

It is important to understand that warm winter temperatures, not irrigation or fertilization, play the major role in stimulating untimely winter flushes of large, mature trees. However, when unseasonably warm temperatures occur, young trees may flush more easily than larger, mature trees, especially trees planted the previous fall. If such young trees flush during winter months, fertilization may stimulate additional, tender growth, making trees even more susceptible. Consider the degree of flush, tree size, time of year, and geographic location when making this decision.

Table 1. Suggested number of times to irrigate young trees per week if no rainfall.*

Months	Young Trees	
	Frequency (times per week)	
	Dripper	Microsprinkler
Nov-Feb	2-4	1-2
Mar-Oct	3-7	2-3
Duration (hours)	3-6	2-3
*Schedule varies depending on number of emitters, soil type, temperature, and wind. Drippers produce 1-2 gallons per hour. Microsprinklers can produce 5-25 gallons per hour.		

Table 2. Suggested number of times to irrigate mature trees per week if no rainfall.*

Months	Mature Trees			
	Frequency (times per week)			
	Dripper		Microsprinkler	
	Ridge	Flatwoods	Ridge	Flatwoods
Sept-Feb	1-2	2-4	1-2	
Mar-Aug	2-4	3-5	2-3	3
Duration (hours)	6-10	6-10	4-6	2-4
* Schedule varies depending on number of emitters, soil type, temperature, and wind. Drippers produce 1-2 gallons per hour. Microsprinklers can produce 5-25 gallons per hour.				