

Resetting in Citrus Groves¹

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Introduction

For maximum efficiency of a production unit or grove, it is essential that every tree space is occupied by a healthy and productive tree. The average annual tree loss across the Florida citrus industry is currently around 6%. However, the extent of tree loss among individual groves can vary from 2 to 12% or more. Prompt replacement of unproductive trees means higher average long-term returns from the grove. If the declining trees remain in the grove, they will continue to weaken and yield less fruit each year, which causes the potential production capacity for the grove to decline even though production costs remain the same or even increase. It is very important to remove and replace such trees once it is clear that they are declining and are no longer economically profitable. Still, the reason for the decline should be determined and the condition should be corrected so that the replacement tree does not suffer the same fate.

If a tree is affected by an incurable disease such as blight, tristeza, or citrus greening, growers should consider replacing the declining tree with a young, healthy nursery tree, a practice called resetting. The resetting program should be conducted regularly rather than being delayed until serious losses in production have occurred. Resets should be planted with the same cultivar already in the block. Usually, it is more economical to keep resetting and not to push the entire block (remove all the trees in the block or grove) unless the cultivar or the tree spacing between rows

is an undesirable one. Replanting in a mature grove seems justified only when a minimum of 8 ft between canopy driplines, not from trunk-to-trunk, is available for canopy development of the new trees.

Replacement of dead, diseased, and declining trees in Florida citrus groves should always be an important part of the total production program. Today, tree replacement is more important than ever since overhead and production costs are dramatically increasing and a full stand of productive trees is essential to maximize production and profits. Freezes, blight, tristeza, *Phytophthora*, *Diaprepes*, and other pests and diseases have been particularly troublesome to Florida citrus growers for the last two decades. Citrus canker and greening have been devastating citrus groves since their introduction to Florida. Extensive tree losses coupled with the economic necessity of regular resetting have caused many growers to investigate ways to achieve new efficiencies in reset management.

Resetting: Not an Easy Task

Caring for young citrus trees is always troublesome because they require far more attention than larger, established trees. Florida's sandy soils, high summer temperatures, possible low winter temperatures, and scattered rainfall patterns complicate young tree care by forcing growers to protect, fertilize, and weed young trees regularly or face extensive losses. Young trees are more sensitive and more attractive to pests than mature trees because they have high levels of vegetative growth. Therefore, special care is needed to insure pests are adequately controlled. Resets

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often present an even greater problem because reset trees are usually scattered throughout a block of larger trees, where they compete with large, full-grown trees for limited supplies of water, nutrients, and sometimes sunlight. Scattered resets frequently have serious weed problems since removal of the previous tree allows the area to receive more sunlight and provides more favorable conditions for weed growth. Since resets are usually scattered throughout a block of much larger trees, they are often difficult to locate and may be accidentally overlooked, resulting in inadequate care. Researchers, growers, and production managers are continually developing and improving methods of dealing with reset care.

Planning the Reset Program

Grove managers should include tree removal and resetting as a routine part of the production program and assign special crews to deal specifically with young tree care. Planning ahead is very important because there is often a lag period between the time when replacement trees are ordered and when they are received. The wait time for the most desired rootstock and scion combination may be as great as 1 to 2 years, so replacement tree needs should be anticipated (when possible) and orders placed so they can be obtained when needed.

Purchasing Trees

High quality reset trees are essential for maximum young tree growth. These young trees will be placed in an intensely competitive situation and may sometimes receive less than ideal care, so there is no room for compromising tree quality. Only healthy and properly sized trees from registered sources should be purchased since the initial cost of young trees is only a small fraction of the total cost of bringing such a tree into production.

Site Preparation

The planting site should be well prepared. Weeds should be removed before planting. At a minimum, a non-residual herbicide should be applied to the reset area to get weeds under control before the young tree is planted.

Planting sites should be prepared well in advance of receiving the trees. Ideally, trees should be planted on the same day they are received. Under no circumstances should trees be allowed to dry out. To minimize root desiccation and damage, keep trees cool and moist until they are planted.

Planting the Trees

Trees should be removed from the container and inspected for evidence of pot-binding. Make several vertical slashes about one inch deep through the root ball to encourage root branching. These slashes also allow the potting soil and roots to interface more closely with the soil in the planting site. It may be easier to cut some of the roots with pruning shears and pull them so they protrude from the ball.

A common problem with nursery trees is that the potting mixture is often highly organic. After the young tree is planted in sandy soil, it is difficult for water to permeate these organic materials and get to the tree's roots. To avoid this, remove the outer third of the organic ball so that the outer roots are exposed and can extend into the sandy soil in which the tree is planted. Otherwise, the tree may not grow off quickly and satisfactorily.

Weed Control

Keeping weeds under control during the establishment period of the reset is very important. Weeds compete with young citrus trees for water, nutrients, soil applied pesticides, and sunlight, so they must be properly controlled. Weed control around a reset site should be considered at pre-plant, early post-plant, and after the tree is established.

Control of weeds prior to planting is important. If residual herbicides are used, they should be used at proper rates and at least 30 days in advance of planting so that residues do not impact reset growth. Prior to planting, contact or growth regulating herbicides may be preferred since they do not leave residual effects in the soil.

Weed control during the establishment period, approximately one year, is frequently quite difficult. Hand labor is scarce and expensive. Trunk damage by hoes or other cultivation equipment further compounds the problem. Chemical weed control provides at least a partial solution to the problem during this establishment period. There is now a fairly wide selection of residual herbicides available, which can be used around young trees. These materials should be applied at reduced rates. Be sure to read labels carefully for restrictions on the use of herbicidal materials around young trees.

After the reset has been planted for a year or more, modifications of the weed control program can be considered. Labels of materials under consideration should be checked carefully for restrictions prior to use. Some herbicides require reduced rates around young trees to minimize

potential damage to resets planted among older trees. Specially modified herbicide applicators are available that enable the equipment operator to deliver reduced rates or a different herbicide mix around young trees.

To minimize herbicide contact to young trees, many growers apply a wrap or guard around the lower 12 to 16 inches of the tree trunk. When using these wraps, be sure to monitor the protective structure for ants or other pests that may damage the tree trunk.

Sprouting

Resets require periodic sprout removal. The use of tree wraps usually reduces the need for sprout control. Wraps often stay in place for up to 3 years. They should, however, be checked periodically for the presence of ants or fungal diseases. Reduced sprouting may be enough to justify their use. There is no simple advice for the use of wraps. Each situation is different and requires careful horticultural and economic consideration to arrive at the best procedure of maintenance, inspection, and management.

Irrigation and Drainage

Young citrus trees require frequent but moderate water application for survival and proper growth. Competition for water is accentuated by nearby older trees or weeds allowed to grow close to the young trees. Anything that can be done to discourage competition for available water should be beneficial to the young tree. Irrigation systems should be in place before planting trees. Special modifications made to the irrigation pattern by inverting the micro-sprinkler so that the surface wetting area is reduced or by increasing irrigation frequency can be good strategies to supply water for resets. However, the irrigation frequency necessary to sustain a mature grove is rarely adequate for good growth of newly-set trees, and young trees should be checked frequently to be certain they are receiving sufficient water. Drainage is as important as irrigation. Excess water must be removed from the rootzone. The concept of total water management must be practiced. If either system—irrigation or drainage—is not designed, operated, and maintained properly, then the maximum profit potential of a grove cannot be achieved. In Florida, both surface and subsoil drainage is necessary to obtain adequate root systems for the trees.

Fertilization

Fertilizing resets requires more effort than fertilizing the bearing grove. Frequent application of water-soluble fertilizers with irrigation water (fertigation) can increase

overall fertilizer use efficiency. If the grove is under a fertigation program, there is no need for special care in terms of nutrition for resets. Great care must be taken to ensure that proper rates of fertilizer materials are dispensed to prevent nutritional deficiencies or toxicities. Frequent light applications usually produce best results and lessen the danger of leaching, but these practices need to be evaluated for cost effectiveness. The use of controlled-release fertilizers for resets is a better option than making multiple trips throughout the year to scattered resets throughout large blocks.

Pest Control

Because young trees have more frequent flushing cycles than mature trees, they are more attractive and sensitive to pests. Therefore, special care is needed to keep the citrus psyllid and leafminer under control to reduce their damage to new leaves and to reduce the severity of citrus canker and the spread of citrus greening. Relying solely on foliar contact insecticides for resets is not a good strategy. Soil-applied systemic insecticides (neonicotinoids) which provide 6–8 weeks of control are the most effective tools for managing psyllids and leafminers on resets. Currently, three neonicotinoid products are registered for use in citrus: imidacloprid (Admire, Alias, Couraze, Nuprid), thiamethoxam (Platinum), and clothianidin (Belay). Various generic formulations are also available. Resets will also benefit from foliar-contact pesticides and from foliar nutrition used on mature trees.

Grove Plat

Since resets are usually scattered throughout a block of much larger trees, they are often difficult to locate and may be accidentally overlooked, resulting in inadequate care. An annually updated grove plat is probably the best method



Figure 1. Scattered resets in a citrus grove.
Credits: Mongi Zekri

for assessing general grove condition and productivity.

Plats can be prepared by hand or with the assistance of a computer. This can help determine the number of trees that will be needed and where they should be placed. Reset plats can be prepared to later help equipment operators locate newly planted trees for periodic care.