



By Amir Rezazadeh

Safeguard trees from heat stress

Florida has an ideal climate for growing citrus. Although there is plentiful sunshine and rainfall in Florida, commercial citrus growers experience various environmental stresses such as drought and heat stress at certain times of the year.

Heat stress affects the production of different citrus varieties, particularly seedless varieties. The severe effect of heat stress can be seen during the flowering and fruit set stage as well as June drop. High temperature can affect different growth stages of citrus trees, such as vegetative growth, flowering and fruit set.

VEGETATIVE GROWTH

Under high temperature exposure, vegetative growth increases in citrus. But after a certain temperature, shoot elongation is retarded. Higher temperature for a longer time (10 weeks) results in shorter internodes in sour oranges and Valencia oranges as compared to normal temperature. High temperature also may result in leaf injury due to electrolyte leakage.

FLOWERING

Flowering stages like flower bud differentiation, anthesis, rate of flowering

and development of different parts of flowers can be influenced by high temperature. One study showed that flower number at an air temperature of 59° F was greater than at 86° F in *Citrus unshiu*.

FRUIT SET AND YIELD

Environmental temperature directly influences fruit set and yield in fruit crops. One of the effects of high temperatures in citrus crops is fruit drop. For example, exposure of Satsuma mandarin to 86 to 95° F for 48 hours in a controlled environment increased fruit drop.

FRUIT QUALITY

High temperature may impact fruit qualities such as size, shape, color, texture, flavor and nutritional value. In citrus, high temperatures in summer cause mature fruit to green because chlorophyll returns to rinds and carotenoid content decreases.

SIGNS OF STRESS

The following are early signs of heat stress on citrus trees:

- Wilted leaves
- Leaves turn yellow.
- Green leaves start falling off the trees.
- Leaf edge curl
- Fruit drop may occur.

TREE PROTECTION

One of the strategies that helps trees to tolerate midday high temperatures is to irrigate early in the morning or during evening to reduce evaporation loss. In summertime, newly planted trees should be watered consistently and more frequently because they do not have a fully established root system. More frequent watering helps trees to better absorb the water and to prevent drought stress. A sprinkler or drip system is a good way to ensure consistent watering. Citrus trees planted in sandy soils need more water compared to those planted in heavy soil.

Check the soil moisture level. If the soil is dry, start irrigation as soon as possible. Some effects of heat stress may last longer or even appear later. It is highly recommended to provide adequate water for trees during hot days.

Using mulch around the base of the tree helps to retain soil moisture. This is especially important for young trees with root systems established around the soil surface. Mulch should be spread in a 2- to 3-foot diameter around the tree. It is important to leave a space between the tree's trunk and the mulch to prevent rotting.

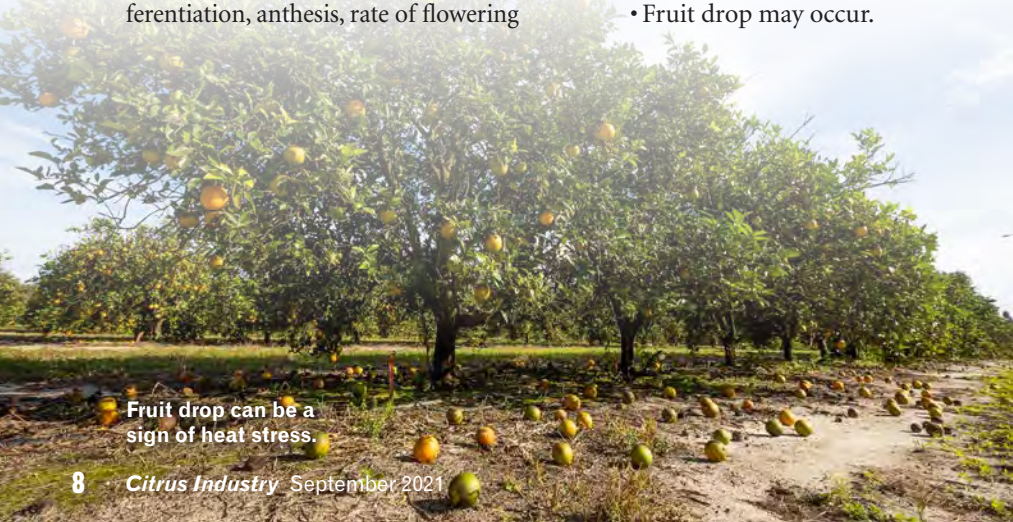
Trees that suffer from nutrient deficiency may be more susceptible to heat stress. It is recommended to have a consistent fertilization plan throughout the whole year to make sure trees stay healthy.

Pruning during stress periods should be avoided as it may result in sun penetration to the inside of the branches and lead to more heat damage.

Pesticide application during hot midday temperatures also should be avoided because chemicals can easily volatilize and result in leaf burning. 🍊

Sources: [elixirpublishers.com/articles/1350116575_39%20\(2011\)%204745-4747.pdf](https://elixirpublishers.com/articles/1350116575_39%20(2011)%204745-4747.pdf), alpinetreenj.com/heatwave-heat-stress-affects-trees and mrtreeservices.com/blog/how-to-protect-your-trees-from-the-summer-heat

Amir Rezazadeh is a multi-county fruit and field crops Extension agent at the University of Florida Institute of Food and Agricultural Sciences St. Lucie County Extension office in Fort Pierce.



Fruit drop can be a sign of heat stress.