



Photo courtesy of Bob Adair, Florida Research Center for Agricultural Sustainability

Metalized reflective mulch can repel Asian citrus psyllids and increase tree growth.

# Optimizing irrigation and young tree management

By Davie Kadyampakeni and Sandra Guzmán

**Y**oung citrus trees require optimal irrigation management for vigorous vegetative growth, leaf flushing and the establishment of a dense canopy. Poor practices such as infrequent irrigation or not using irrigation scheduling tools could be costly. Young tree growth also could be impacted by excessive water and nutrient losses. Crop water stress in young trees directly affects yield and fruit quality. This article covers some strategies for optimizing young tree care and irrigation management for grove efficiency and productivity.

## REFLECTIVE MULCH

In the past five to 10 years, the use of reflective mulch has been effective for improving the establishment and performance of young trees. Limited evaporation saves water, and the reflective mulch repels the Asian citrus psyllid (the pest that transmits the pathogen that causes citrus greening) and regulates soil temperature.

Additionally, since most of the water is delivered within 6 to 10 inches of the root zone, nutrient and water uptake are increased significantly, resulting in

vigorous tree growth. This aids in the establishment of a promising citrus grove that can sustain retention of the first fruit load in the era of citrus greening.

## PLASTIC-FABRIC MULCH COVERS

Plastic groundcover also appears to increase water storage in the soil and limit evaporation, thereby promoting water-use efficiency. In studies conducted on Ridge and Flatwoods soils, these covers achieved greater water retention and faster growth, compared

to bare ground. Preliminary insights from plastic-fabric mulch ground-covers can be found on the Citrus Industry website (see [citrusindustry.net/2020/04/14/fabric-mulch-ground-covers-save-water](http://citrusindustry.net/2020/04/14/fabric-mulch-ground-covers-save-water)).

## FREQUENT IRRIGATION WITH EXISTING TOOLS

Most importantly, frequent irrigation enhances the performance of young trees. Readily available tools include soil moisture sensors, weather stations (Florida Automated Weather Network stations available at [fawn.ifas.ufl.edu/](http://fawn.ifas.ufl.edu/) or commercially available weather stations) and irrigation apps.

There are at least seven different operating principles of electronic soil water sensors used by various brands: time domain reflectometry (TDR), time domain transmission (TDT), frequency domain reflectometry, amplitude domain reflectometry, phase transmission, tensiometer, and resistance granular matrix sensors. For sandy Florida soils, using capacitance, TDT and TDR sensors is appropriate due to low maintenance requirements.

The installation processes for these sensors and interpretation of soil moisture are available and their advantages and suitability for irrigation scheduling on sandy soils have been discussed by several authors (see [citrusindustry.net/2017/07/10](http://citrusindustry.net/2017/07/10) and [citrusindustry.net/2018/07/10](http://citrusindustry.net/2018/07/10)).

Information on the equations for calibrating different brands of soil moisture sensors is available at [mdpi.com/2073-4441/12/2/358](http://mdpi.com/2073-4441/12/2/358), [link.springer.com/article/10.1023/A:1017915114685](http://link.springer.com/article/10.1023/A:1017915114685) and [doi.org/10.2136/sssaj2008.0264](https://doi.org/10.2136/sssaj2008.0264).

The use of weather stations and smartphone irrigation apps for proper irrigation scheduling and determination of water budgets is discussed by researchers at [edis.ifas.ufl.edu/pdf/files/SS/SS66000.pdf](http://edis.ifas.ufl.edu/pdf/files/SS/SS66000.pdf). These tools are cost-effective ways of reducing water inputs and increasing water savings in citrus production operations by real-time monitoring of water use or crop evapotranspiration, rainfall and irrigation events.

## PROPER FERTIGATION

Correct timing and placement of fertilizer in the root zone are important

Photo by Eduart Murcia, UF/IFAS



Plastic cover promotes water-use efficiency.

to ensure increased uptake of nutrients. Using fertigation for young trees increases water and nutrient availability in the root zone, minimizes nutrient leaching, enhances nutrient uptake and promotes root length density

distribution around the tree.

Information regarding the right amounts of fertilizer to apply for young trees is available in Nutrition of Florida Citrus Trees, 3rd Edition (see edis.ifas.ufl.edu/ss478).

### CONCLUDING SUMMARY

In summary, using irrigation-scheduling tools, weather stations and irrigation apps is important for managing young citrus groves and ensuring production efficiency. Some tools that growers have for establishing young citrus groves, such as reflective mulch and plastic-fabric covers, can also control pests and improve water savings and nutrient retention while promoting vigorous tree growth and potentially boosting early fruit yields.

*Correct timing and placement of fertilizer in the root zone are important to ensure increased uptake of nutrients.*

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