

# Influence of Groundcovers on Citrus Yield and Water Use for Commercial Applications

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## Take Home Message:

- Groundcovers resulted in a 30% higher fruit weight compared to uncovered treatments, indicating a positive impact on yield for the second consecutive year.
- Implementing soil moisture sensor-based irrigation in conjunction with groundcovers has the potential to reduce water usage by 20%, maintaining the soil moisture for longer.
- Besides managing *Diaprepes*, the use of black fabric mulch groundcovers can also optimize water uptake by trees and retain nutrients around the root system.

**Effort Statement:** For the 2022 season, there were not significant differences in yield between the covered and uncovered treatments. However, the average yield was higher for the covered treatment. In terms of soil moisture, the covered treatment

consistently retained more moisture. In the uncovered treatment the presence of weeds might have served as a mulch, adding water retention within the soil.

**Summary:** In Florida citrus, black fabric mulch groundcovers have been used for the control of the invasive insect, *Diaprepes abbreviatus* (root weevil). However, these groundcovers also have the potential to optimize water uptake by trees and retain nutrients around the root system, making them a beneficial management practice. Over a three-year period from 2019 to 2021, we conducted a study in a commercial lemon grove to evaluate the effects of fabric mulch groundcovers on water, plant root growth, and yield. We collected real-time data from soil moisture sensors and monitored environmental factors such as rainfall, soil temperature, solar radiation, and wind velocity. This information

allowed us to provide daily irrigation recommendations for both the covered and uncovered groundcovers. We compared the total water applied in each treatment with various physiological variables including root and canopy growth, trunk diameter, and fruit yield to assess the impacts of these groundcovers. Our findings show that the use of groundcovers resulted in a 30% higher fruit weight compared to the uncovered treatment. Canopy growth and trunk diameter also showed improvement with the presence of groundcovers. In terms of water usage, combining soil moisture sensor-based irrigation with groundcovers led to potential water savings of up to 20%. The frequency and timing of irrigation events played a role in maximizing the positive effects of these management practices. More frequent irrigation with shorter durations, preferably in the early morning (before 8:00 am), could be beneficial.

## Funding:

 National Institute of Food and Agriculture  
U.S. DEPARTMENT OF AGRICULTURE