

# Response of Grapefruit Seedlings to Reclaimed Water as Alternative to Groundwater in Florida

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**Summary:** Coastal agriculture often relies on surface water for irrigation, known for its favorable quality for crop production. However, in Florida's agriculture, the availability of this source can be limited during the dry season forcing the growers to switch to groundwater. Groundwater in coastal areas usually has high salt concentrations that can have a negative effect on crop production. *Citrus spp.* is sensitive to salinity stress and one of the most produced crops in the state. Alternative water sources, such as reclaimed water, must be evaluated as a readily available option for sustainable irrigation during the dry season. The objective was to evaluate the response of grapefruit to different water sources and their respective salinity concentrations, along with their impact in soil salt

accumulation. One-year-old seedlings were grown under controlled greenhouse conditions. Four treatments were applied: surface water (0.3 dS/m), reclaimed water (1.1 dS/m), blended (2 dS/m), and groundwater (3.5 dS/m). Although plants irrigated with surface water showed better performance than the rest of the treatments, plants treated with reclaimed water showed less intensity of plant stress indicators, higher chlorophyll content, and lower electrolyte leakage, compared to those irrigated with groundwater. Higher root biomass was found in plants irrigated with reclaimed water. Soil electrical conductivity (EC) increased up to 1.8 dS/m across the experiment surpassing grapefruit salinity tolerance for the groundwater treatment. Reclaimed

water demonstrated better physiological plant performance with lower salt accumulation compared to groundwater, positioning it as a viable alternative water source in southeast Florida's dry season.

## Take Home Message:

- Reclaimed water shows potential as a sustainable irrigation alternative in coastal agriculture during dry seasons.
- Salinity stress negatively affects grapefruit plants in short term, even when the water source is close to 3.5 dS/m.
- Reclaimed water not only promotes better plant performance but also slows down the salt-build up in the soil compared to groundwater.

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