

## **ELECTRICAL SIGNAL MEASUREMENTS AS A TOOL FOR MONITORING RESPONSES OF AVOCADO (*Persea americana* Mill) TREES TO SOIL WATER CONTENT**

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Monitoring soil water content together with plant-monitoring techniques have proved to be very good management tools for making irrigation decisions in avocado orchards. There are many well-tested devices for monitoring soil moisture content in orchards, but options for measuring plant water status are limited. The objective of this study was to determine if measuring variations in electrical voltage differences between roots and leaves can be used as a plant-monitoring technique related to soil water content. Root and shoot voltages differences were monitored in two-year-old 'Hass' avocado trees grafted onto Duke 7 rootstocks in a laboratory. Root and shoot voltages differences were initially measured for about 2 hours in unaltered trees to determine steady state (control) conditions. Plants were then exposed to cycles of soil (root) drying and re-watering. The extracellular electrical potential difference between the base of the trunk and the leaf petiole was continuously monitored after exposure to soil drying or re-watering. Results indicated that a change in soil water content induced by root drying and re-watering was accompanied by a slow significant change in the electrical signal at the leaf petiole which was greatest after 52 and 32 minutes for root drying and re-watering, respectively. Measurements in girdled plants suggest that the electrical signal is propagated in the xylem. Therefore, it is possible to use electrical voltage differences between roots and shoots as a plant-monitoring technique to relate physiological responses of avocado trees to soil moisture content.