

Use of the ADC LCA 3 in Avocado Fruit Physiology

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Abstract. Transpiration, stomatal conductance, and CO₂ exchange of developing 'Fuerte' and 'Hass' avocado fruit were measured. A fruit chamber was constructed which allowed the fruit to remain attached to the tree, thereby enabling replicate measurements on the same fruit. The fruit chamber was made of two glass hemispheres and aluminum alloy and was fitted with a light sensor and a temperature sensor. Two humidity sensors for inlet and outlet air allowed measurements under any ambient humidity without drying inlet air. The air within the chamber was vigorously stirred to give a boundary layer conductance (r_b) of 0.19 m²/s/mol. The fruit chamber was made compatible with the portable, microprocessor-controlled LCA 3 photosynthesis system from ADC. Flow rates were controlled by the two mass-flow meters of the LCA 3. All physiological parameters, including stomatal conductance (c_s) were related to total fruit surface area rather than projected leaf area. Photosynthesis or respiration were determined by the infrared gas analyzer of the LCA 3, while transpiration was measured from the difference in humidity of the air entering and leaving the fruit chamber.