

**Title** Influence of water and ABA supply on the ripening pattern of avocado (*Persea americana* Mill.) fruit and the prediction of water content using Near Infrared Spectroscopy

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### **Abstract**

Avocado fruit are highly variable, and even those graded for similar size and appearance do not behave in the same manner after harvest. This is particularly problematical for those involved in sales to the “ready-ripe” market. These operations are faced with a high variation in the rate of ripening within a consignment, causing logistical difficulties. Fruit water content (or its complement dry matter) has a major impact on-line ripening and has hence been used as the maturity marker in the South African avocado industry. Presently, fruit water content is destructively measured using a representative sample as an indicator of when to post-harvest. In order to investigate if fruit water content and/or abscisic acid triggers fruit ripening, water or ABA was infused into commercially mature, but non-ripe avocado fruit. The fruit ripening, mass, CO<sub>2</sub> and ethylene production patterns were determined over the ripening period. By infusing water through the pedicle, the variation in days to ripening was decreased without any effect on the number of days to ripening. ABA infusion hastened ripening but did not affect the variation in days to ripening. It is therefore suggested that the fruit water content at harvest forms the baseline condition from which the trigger for ripening is determined, while post-harvest water loss and ABA modulate and stimulate ripening, respectively. Furthermore, an equation was developed using Near Infrared Spectroscopy (NIRS) to measure mesocarp water content ( $R^2 = 0.92$ , SE = 1.8% MC). It is postulated that on line sorting of fruit using NIRS, based on time to ripen, would result in consignments of fruit with less ripening variation, thereby solving the industry's logistical problem of fruit which have a wide spread of ripening being packed into one carton.