

# **VAPOUR HEAT TREATMENT OF 'HASS' AND 'FUERTE' AVOCADO (*Persea Americana* Mill.) FRUIT FOR EXTENDING STORAGE LIFE**

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Submitted in partial fulfilment of the requirements for the degree of Master of Science in Agriculture in the Department of Horticultural Science, University of Natal, Pietermaritzburg

January, 1998

## **ABSTRACT**

In an attempt to extend storage life of 'Hass' and 'Fuerte' avocado (*Persea Americana* Mill.) fruit postharvest vapour heat treatments were used. Vapour heat treatment temperature regimes were 36, 38, 40 and 42°C for either 1, 2, 4 or 8 hours. After vapour heat treatment, fruit were cold stored at 3.5°C, for 5 or 6 weeks each. On removal from cold storage fruit were evaluated for firmness, and ripened at room temperature. Once ripe fruit were evaluated for heat/cold damage, days to ripening, weight loss and physiological disorders. These experiments were conducted during the 1996 and 1997 'Fuerte' and 'Hass' avocado seasons.

Electron microscope analysis of vapour heat treated fruit revealed heat damage to the epidermis and fruit organelles of certain treatments. The effect of vapour heat treatment on protein synthesis on 'Fuerte' and 'Hass' avocado was investigated using gel electrophoresis, to determine if presumed heat shock proteins were synthesized under the treatment conditions. The activity of pectin methyl esterase was also investigated on the heat treated 'Fuerte' and 'Hass' avocados, to investigate if heat alters the activity of this enzyme.

All experiments showed that vapour heat treatment extended 'Fuerte' and 'Hass' avocado storage and shelf life. Evaluation of the time/temperature combination for vapour heat treatment for each cultivar indicated that extension of shelf life was, in some cases, limited by rind heat damage. For the 1996 season, the best time/temperature combination for 'Fuerte' was at 38°C between 4 to 8 hours, 40°C between 4 to 8 hours and 42°C between 2 to 4 hours. For 'Hass', best results were achieved at 38°C between 4 to 8 hours. For the 1997 season, 'Fuerte's best time/temperature combination were at 36°C for 8 hours, 42°C between 1 to 2 hours and marginal results at 38°C between 4 to 8 hours. For 'Hass' the best time/temperature combinations were achieved at 38°C and 40°C for 8 hours. Analysis of fruit flesh protein indicated changes associated with vapour heat treatment, and even induction of new proteins, perhaps heat shock proteins, giving 'Fuerte' and 'Hass' avocados beneficial characteristics such as an extension of shelf life. There was a decline in activity of pectin methyl esterase after vapour heat treatment, which was associated with a longer shelf life.