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## USES OF 1-MCP FOR IMPROVING 'HASS' AVOCADO STORAGE QUALITY

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1-MCP (1-methylcyclopropene) is of interest in postharvest research due to its ability to block ethylene responses. 'Hass' avocados have a limited storage life of 4-5 weeks due to the development of diffuse flesh discoloration ("internal chilling injury" or "flesh greying"). Since ethylene plays a role in the development of this disorder, two seasons work have been carried out to determine the effect of 1-MCP on storage of 'Hass' avocados. Following 1-MCP treatment, fruit were stored at 5.5°C for 4 or 7 weeks and upon removal from storage, skin colour and firmness were measured. Fruit were ripened at 20°C and when ripe, assessed for both external and internal quality. The effect of concentrations of 1-MCP (50-1000ppb) applied to avocados 2 days after harvest at 6 or 15°C, for a period of 24 h was also investigated. The effects of treatment duration (6, 12 and 24 h), time of harvest (maturity), and orchard effects were also examined for two 1-MCP concentrations (100 and 250ppb). In some of these trials we examined the effect of ethylene treatments (typically 100ppm ethylene for 24 or 48 hours at 20°C) upon removal from storage. 1-MCP treatment resulted in firmer, greener fruit immediately after removal from storage. 1-MCP treatment also delayed ripening following removal from storage. Relatively little difference was observed between fruit treated at 15 and 6°C, and given the current commercial practice of cooling fruit soon after harvest, a treatment temperature of 6°C is recommended. The effect of 1-MCP concentration and duration on skin colour and fruit firmness out of storage was not large, but lower concentrations appear to be optimal for ripe-fruit quality. Physiological disorders (such as diffuse flesh discoloration) were almost completely eliminated in fruit treated with 1-MCP and stored for 7 weeks (even for late season fruit) and 1-MCP treatment consistently improved the proportion of acceptable fruit. However, after 4 weeks storage, the incidences of physiological disorders were relatively low and 1-MCP benefits were less clear. At the higher 1-MCP concentration, time to ripening appeared to be unduly extended (which may not be acceptable to commercial fruit handlers) and when the avocados were ripened the incidence of rots was sometimes higher than in untreated fruit. We found variable effects of ethylene treatment following storage, and thus ethylene treatment may not be a reliable treatment for shortening and coordinating ripening time for fruit treated with 1-MCP. Thus, 1-MCP shows promise as a tool for reducing physiological disorders due to long-storage of 'Hass' avocados.