# Effect of agro-ecological zone and maturity on the efficacy of 1-methylcyclopropene (1-MCP) in extending postharvest life of purple passion fruits (*Passiflora edulis* Sims)

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## Abstract

Purple passion fruit (*Passiflora edulis* Sims) is cultivated across a wide range of agro-ecological zones (AEZ) in Kenya. Preharvest conditions including temperature, rainfall, soils, and mineral nutrition have been shown to affect horticultural commodities' quality potential at harvest and their response to postharvest treatments. In the present study, the effects of agro-ecological zone and stage of maturity of passion fruits (*Passiflora edulis* Sims) on the efficacy of 1-methylcyclopropene (1-MCP) and on the postharvest life and quality of passion fruits were investigated. The fruits were produced in two agro-ecological zones; Eldoret, a high potential zone where production is entirely rain-fed and Machakos, a low potential zone where production is via supplementary irrigation. The fruits were harvested at two stages of maturity, at mature green stage, 50-55 days after anthesis (DAA) and at turning stage (60-65 DAA). Fruits were treated at 22°C with 1-MCP at a concentration of 2 μl $L^{-1}$ for 16 hours and thereafter stored at 24°C. The fruit were analyzed daily for weight loss and respiration rate and after every three days for other physicochemical changes associated with ripening and quality. The AEZ significantly affected some postharvest parameters indicated by fruit from low potential area showing higher °Brix: acid ratio while the fruit from high potential showing significantly higher total carotenoid content. The respiration rate of passion fruit was suppressed after 1-MCP treatment at both stages in both AEZs. Though there was an absolute decrease in the respiration rate in 1-MCP treated fruit, there was no time delay in the appearance of the respiratory peaks at both the maturity stages. These results suggest that for commercial application of 1-MCP in passion fruit, stage 2 is optimal to ensure efficacy, since they were still marketable on day 14. However, there is the necessity to control moisture loss that contributes to shrivelling to improve the consumer appeal for marketing fresh passion fruits.