

Title Utility of 1-methylcyclopropene as a papaya postharvest treatment
Author Ashariya Manenoi, Emma Ruth V. Bayogan, Siwaporn Thumdee and Robert E. Paull
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Abstract

The postharvest utility of 1-methylcyclopropene (1-MCP) for papaya, *Carica papaya* L. (cvs. Gold and Rainbow) was determined. The effect of fruit maturity, storage, 1-MCP concentration (50–1000 nL L⁻¹), 1-MCP treatment duration (4 and 24 h) and ethephon treatment before and after 1-MCP were evaluated. Fruit treated with various concentrations of 1-MCP for 24 h were firmer and the time to reach the edible ripe stage was longer than the non-treated control. Treating for 4 or 24 h with 1-MCP had similar effects on all ripening parameters. Careful handling, hot water treatment and fungicide treatment were required to minimize postharvest disease and to determine the effect due to 1-MCP. Disease following 1-MCP treatment occurred later and had less severity than in the non-treated control fruit. The onset of ethylene production and the rise in the respiration rate was delayed and suppressed in 1-MCP-treated fruit. When ripened at 22 °C, 1-MCP-treated color break fruit had a delay of about 7 d in softening and skin color development but only a slight effect on total soluble solids (TSS) and weight loss. However, papaya treated with 1-MCP at the color break stage were firmer and showed a ‘rubbery’ texture at the ripe stage. Fruit treated with 1-MCP when more than 25% skin yellow ripened normally. Storage of 10% yellow fruit at 10 °C for 7 d before or after 1-MCP treatment had no effect on 1-MCP softening response. 1-MCP treatment before or immediately after ethephon treatment also showed no difference in softening pattern. Fruit treated with 1-MCP in a polyethylene lined cardboard shipping carton had delayed ripening, without the liner the response was reduced. Modified atmosphere storage after 1-MCP treatment further extended the delay in ripening. It was concluded that papaya fruit treated with 1-MCP when more than 25% ripe had a delay in softening that may have commercial utility.