

**Title** 1-methylcyclopropene pretreatment of intact watermelon counteracts ethylene-induced quality deterioration and microbial growth on fresh-cut watermelon

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#### **Abstract**

Seedless watermelons (c.v. Sugar Heart) were harvested at commercial maturity, stored 1 or 7 days at 20 °C, pretreated with 0.0, 0.5 and/or 1.0 ppm 1-methylcyclopropene (MCP; 18 hours at 20°C), and then-stored in air without or with 10 ppm ethylene for 5 days at 20°C. The melons were then stored an additional 1 or 7 days at 20°C prior to fresh-cut processing. Water washed, chlorine sanitized fruit were processed into wedges. The wedges were packaged into trays that were sealed with polypropylene films with an oxygen transmission rate of 400 (unit). Packaged samples were stored at 5°C for up to 12 days with quality evaluations performed every 6 days. Exogenous ethylene treatment increased the aerobic bacterial counts (ACP) on the freshly cut wedges by at least 2 log cfu/g compared to that on wedges processed from non-treated melons. Throughout storage, wedges from ethylene treated melons maintained higher aerobic bacterial, yeast and mold, and lactic acid bacterial counts than wedges from non-treated melons, and was accompanied by enhanced solute leakage and water soaking appearance. Treatment with 0.5 or 1.0 ppm MCP counteracted the ethylene-induced quality deterioration. The efficacy of the MCP treatments was not affected by the timing of the MCP treatment or by the concentration used. These results indicate that MCP pretreatment of intact watermelon blocks ethylene activity, thereby delaying senescence and inhibiting tissue decay and microbial growth on fresh-cut watermelon.