Effect of 1-methylcyclopropene (1-MCP) and 1-MCP plus ethylene combinations on the green shelf-life and ripening of banana [*Musa* AAA (Cavendish sub-group) 'Williams']

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Abstract

The effect that different 1-methylcyclopropene (1-MCP) plus ethylene (Et) combinations have on the storage potential and ripening of banana fruit was determined during two laboratory trials. During the first trial the fruit were pre-cooled to 14°C where-after 1-MCP and Et were applied at 14°C in ratios of 300:0, 300:300, 300:600, 300:1200 and 300:1800 ng L^{-1}. During the second trial the banana fruit were pre-cooled to 20°C where-after the 1-MCP plus Et combinations were applied at 20°C in ratios of 300:0, 300:300, 300:600, 300:1200, 300:1800 and 600:2400 ng L^{-1}. Following the 1-MCP plus Et applications, the fruit were cold-stored at 14°C for one month. During storage, respectively 7.1% of control fruit in the first trial and 35.7% of control fruit in the second trial ripened, while none of the 1-MCP plus Et combinations ripened. After the cold storage period, the bananas were artificially ripened for four days at 22°C in the presence of 100 mg/L ethylene gas. During the first experiment, all fruit of the control and 300:1800 treatment ripened, although ripening was less uniform in the 300:1800 treatment, especially during the first three days of the shelf life period at room temperature. With the other combination treatments, response to artificial ripening was poor with less than 30% of the samples yellowing, while all fruit in the 300:0 treatment was still green. During the second trial the fruit responded fairly similarly to artificial ripening, but the 300:1800 treatment ripened more uniformly than during the first trial. This combination was therefore the most promising 1-MCP plus Et treatment. From the results it would appear that the combination treatments may have commercial potential, but extensive semi-commercial trials will be required to confirm this.