

Title The effect of 1-MCP (1-methylcyclopropene) treatment methods on the ripening process of tomato fruit during postharvest storage

Author Lee Y.S., Kim J.N. and Chung D.S.

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Abstract

The effects of 1-MCP treatment and storage temperature in controlling the ripening progress of three developmental stages in tomatoes were evaluated using the peel color, firmness, total weight, ethylene production, and overall visual quality loss. 1-MCP treatment was very effective on peel color change and firmness of tomatoes at the respective temperatures, which are the index of the fruit's ripening during storage. Continuous 1-MCP treatment was more effective compared to single 1-MCP treatment. In addition, ripening of tomatoes stored at 10°C was more delayed than storage of fruit at 15 and 20°C. The weight loss rate of fruit showed no significant difference between 1-MCP treatment and the control. The loss rate of total weight in whole fruit at 20°C was faster than that at 15 and 10°C. External ethylene production on fruit showed the highest value for fully ripening progress on 15 days at 20°C as compared to fruit stored at 10 and 15°C. However, no significant differences in ethylene production were found between 1-MCP treatment and the control at the respective temperatures. The evaluation of overall quality of tomato fruit with 1-MCP treatment showed higher quality acceptance compared to that of the controls on day 20. The results showed that continuous exposure of 1-MCP gas on the surface of fresh fruit at the lower storage temperature of 10°C would be the most effective at reducing quality change of tomato fruit.