

EFFECT OF 1-MCP ON ETHYLENE REGULATION AND QUALITY OF APPLE, APRICOT AND ASPARAGUS

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ABSTRACT

The effect of 1-methylcyclopropene (1-MCP) on fruits and vegetables has always been a topic of interest. The current study was conducted to investigate the effect of 1-MCP on ethylene production and on quality of apple (*Malus domestica*) during ripening, of Japanese apricot (*Prunus mume*) harvested at green and yellow stages, of and asparagus (*Asparagus officinalis*) spears. The apple fruit, Japanese apricot fruit, and asparagus spears were treated with 1-MCP for 24 h. Ethylene, CO₂, color, firmness, and upward growth (bending upward when stored at a horizontal position due to negative geotropism) of the asparagus spears were measured sequentially at the laboratory of Tropical Horticulture, Department of International Agricultural Development, Tokyo University of Agriculture (Setagaya campus) from 2014-2015. Ethylene production reduced significantly in apple, was unaffected in Japanese apricot, and increased in asparagus. Respiration significantly decreased in apple and Japanese apricot during green and yellow stages, but no significant changes were observed in asparagus spears. Quality parameters, such as color, firmness and weight loss (apple) have improved in all the tested fruits and vegetable, suggesting that 1-MCP could maintain quality during storage under ambient conditions. Asparagus spears in a horizontal position stopped upward growth when these were treated with 1-MCP, suggesting it could improve asparagus post-harvest quality

Key words: firmness, respiration, upward growth

INTRODUCTION

Fruits and vegetables are important sources of vitamins, minerals, sugar, fiber, and other nutrients. As recommended by the World Health Organization (WHO), an adult needs to consume at least 400 g of fruits and vegetables daily (WHO, 2003). Although Southeast Asian countries have experienced significant economic progress, rapid growth still has not improved the livelihood and nutrition in these regions. These countries still deal with poor nutrition (i.e. deficiencies in carbohydrates, proteins, essential vitamins and minerals) and infectious diseases (AVRDC, 2014-16). To provide a variety of fruits and vegetables throughout the year, there are various activities which deliver adequate nutrients, from the introduction of new vegetable varieties, encouraging traditional vegetable production at home and school gardening to appropriate postharvest technologies (AVRDC, 2016).

On the other hand, maintaining quality of fruits and vegetables is critical, as they are prone to lose postharvest freshness and decay faster than other agricultural commodity. The loss of fruits and