

Title The influence of bioregulators on the instrumental and sensory quality of apples and apple juice
(*Malus x domestica* Borkh)

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Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16
July 2004, Las Vegas, Nevada, USA. 321 pages.

Keyword apple; sensory quality; bioregulator

Abstract

Fresh market apples are a popular consumer product. To maximize apple quality, pre-harvest and post-harvest treatments to accelerate or retard ripening are often applied. Control over the ripening process would maximize quality and consumer acceptance. Ethephon (ETH) stimulates ripening in apples while aminoethoxyvinylglycine (AVG) and 1-methylcyclopropene (MCP) inhibit ethylene biosynthesis or ethylene action in apple fruits and retard ripening. The objective of this study was to determine if these three bioregulators could beneficially affect the instrumental and sensory quality of apples. This study was conducted using mature 'Scarletspur Delicious' and 'Gale Gala' apple trees. AVG was applied at 125 mg/liter 4 w before first harvest. ETH was applied at 150 mg/liter 2 w before first harvest. A third treatment included both bioregulators. Untreated trees served as controls. After harvest, half the fruit from each bioregulator treatment was treated with MCP. Apples were stored in regular atmosphere (RA) for 60 d and controlled atmosphere (CA) for 120 or 180 d prior to instrumental and sensory evaluation. ETH alone increased color, carbohydrates, and sensory acceptance, but reduced firmness and acids during storage. AVG alone reduced skin color, carbohydrates, and sensory flavor acceptance, but improved retention of firmness, acids, and sensory texture. A combination of AVG and ETH increased color and carbohydrates while reducing loss of firmness, acids, and sensory quality during storage. Combining AVG with ETH permitted the delay of harvest for 2 w with little loss in storability. MCP alone reduced the loss of firmness and acids during storage, but reduced sensory scores for both whole and juice apples. MCP combined with ETH allowed for good color, firmness, acids, and sensory texture and flavor. Response to bioregulators was more pronounced in 'Scarletspur Delicious' than 'Gale Gala' apples. These results will aid in design of treatments to maximize fresh market apple quality.