

## **Abstract**

During fruit ripening on the tree and after harvest some essential processes involve the production of the anaerobic metabolites, acetaldehyde (AA) and ethanol. These processes include the production of aroma volatiles and removal of fruit astringency. Acetaldehyde, a natural aroma component, is present in almost every fruit; it accumulates during ripening even under aerobic conditions, but to a much greater extent under partially or totally anaerobic conditions. Partially anaerobic conditions often occur during fruit ripening and under storage conditions, for example, through coating with waxes or other films, or in modified and controlled atmospheres.

A requirement for anaerobic metabolites in normal ripening provided the initial indication that the application of such anaerobic metabolites might be beneficial for postharvest fruit quality. In some fruit it was found that application of ethanol or AA alone can affect fruit ripening on the tree, for example, in figs (to induce maturity), banana and persimmon (to remove astringency), and grape (to increase anthocyanins). In the postharvest period anaerobic metabolites may be applied to induce volatile production and to improve fruit aroma. In addition, it has been found that AA has fungicidal and insecticidal activity. Acetaldehyde and ethanol have been shown to be capable of retarding senescence and inhibiting ethylene production in plants, leading to less chilling injury symptoms in various fruit.

However, anaerobic metabolites should be applied carefully, depending on the species and variety of the fruit. Subtropical fruit are among the most sensitive to anaerobiosis damage, but application of AA in high concentrations can be phytotoxic to all fruit.