

**Title** Aminoethoxyvinylglycine effects on late-season apple fruit maturation  
**Author** F. Paul Silverman, Peter D. Petracek, Michael R. Noll and Prem Warrior  
**Citation** Plant Growth Regulation 43 (2):153-161. 2004.  
**Keywords** Ethylene; Fruit maturation; Fruit ripening; Starch mobilization

#### **Abstract**

Aminoethoxyvinylglycine (AVG) inhibits 1-aminocyclopropane-1-carboxylic acid (ACC) synthase, and thus blocks ethylene synthesis. Preharvest foliar application of AVG to apple (*Malus domestica* Borkh.) fruit retards several key events of maturation including climacteric ethylene production, starch conversion to sugars, fruit softening, and abscission zone development. Although the impact of AVG on apple fruit maturation is well known, the biochemical basis of these effects is not well understood. The effects of AVG application on Redchief 'Delicious' apple fruit maturation were studied. AVG applied four weeks prior to harvest significantly reduced internal ethylene levels, amylose degradation, and accumulation of sucrose, glucose, and sorbitol. Because AVG application coincidentally inhibited starch degradation and the increase in internal ethylene, we investigated the enzymatic basis of starch mobilization in apple fruit. Amylase activity was somewhat reduced in AVG-treated fruit. Amylase activity was less in AVG-treated fruit during the early stages of starch mobilization. Starch phosphorylase activity increased dramatically during the later stages of starch mobilization, but was not affected by AVG treatment. Soluble starch synthase activity was also unaffected by AVG treatment and remained constant throughout the eight-week harvest period. Moreover, AVG did not affect the levels of amylopectin, fructose, malate, ascorbate, citrate, or anthocyanin. These results suggest that apple fruit ripening has both ethylene-dependent and -independent processes occurring simultaneously.