Title Recent developments in AVG research

Authors G.D. Venburg, R. Hopkins, J. Retamales, J. Lopez, J. Hansen, G.G. Clarke, M. Schröder, A.C. Rath

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Abstract

The naturally occurring non-protein L-amino acid AVG (Aviglycine HCl, Aminoethoxyvinylglycine HCl) temporarily inhibits ethylene biosynthesis in plants by competitively inhibiting the pyridoxyl phosphate-dependent enzyme ACC Synthase, a key enzyme in the ethylene biosynthesis pathway that catalyzes the conversion of S-adenosylmethionine to the ethylene precursor 1-aminocyclopropane- 1-carboxylic acid. AVG reduces endogenous ethylene production, but does not affect the plant's sensitivity to ethylene. The commercial AVG product, ReTain®, has been registered and commercialized in many fruit producing countries and is listed for use in organic farming in the United States. Preharvest application of ReTain® temporarily delays the maturation and ripening of climacteric fruit such as apples and stone fruit. Well-established benefits include improved harvest management, reduction of pre-harvest fruit drop, and maintenance of fruit firmness at harvest and through storage. Studies have demonstrated that ReTain® can help optimize fruit maturity for long term storage and can lead to increased fruit size and yield when harvest is delayed. Recently, AVG research has included work on flowering and fruit set, given the importance of ethylene in these processes. In walnut, nut-producing pistillate flowers abscise as a result of over-pollination and ethylene production, leading to poor yields. Studies have demonstrated that ReTain® application during flowering improves nut set and yield in 'Serr' walnut. In pineapple production, flowering is synchronized by application of ethylene. Natural induction of flowering, associated with cooler temperatures and short days, can be a significant problem for pineapple growers. Excessive natural flowering can result in a large number of small fruit, a range of fruit ripening stages, and more harvest picks. Applications of ReTain® have been shown to effectively reduce natural flowering, thereby making it possible to obtain a uniform large fruit size and maturity at harvest.