

Title Ethylene and preharvest drop: the effect of AVG and NAA on fruit abscission in apple (*Malus domestica* L. Borkh)

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Abstract

L-Aminoethoxyvinylglycine (AVG) and 1-naphthylacetic acid (NAA) are known to affect preharvest fruit drop, fruit quality and fruit maturation in Golden Delicious apples (*Malus × domestica* Borkh). Experiments were carried out on GD/M9 trees treated at three different developmental stages (41, 28 and 17 days before the beginning of the commercial harvest) with AVG and NAA. Both chemicals significantly reduced fruit drop without significantly affecting the fruit weight. Background colour development and ripening were both delayed by AVG, whereas NAA significantly enhanced yellowing without affecting the evolution of ripening. Ethylene evolution and transcription profiles of genes involved in ethylene biosynthesis (*MdACSI* and *MdACO1*) and action (*MdETR1*, *MdERS1* and *MdCTR1*) were monitored in cortex from the date of the first treatment until the beginning of fruit drop in the control trees (21 days after the beginning of commercial harvest). AVG blocked or efficiently reduced the ethylene evolution. This effect was paralleled by a down-regulation of *MdACSI*, *MdACO1*, *MdETR1* and *MdERS1*. NAA at the second and third date of application enhanced the onset of ethylene evolution, although, at the end of the experiment, no difference was found between control and treated fruits. The chemical applied in the first date significantly down-regulated the transcription of the genes at the end of the experiment. *MdCTR1* expression, basically unaffected by AVG and NAA, appeared to be transiently down-regulated. The initial down-regulation is under developmental control, whereas the late regain of transcript accumulation paralleled the ethylene evolution.

<http://www.springerlink.com/content/k4w763677h41r305/fulltext.pdf>