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Poster Abstract - E.17

ETHYLENE IN APPLE FRUITLET ABSCISSION

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Many fruit species bear an abundance of flowers which produce a surplus of fruits that the tree is unable to support. In anticipation of this, the major fruit species developed an immature fruit (fruitlet) physiological drop as a self regulatory mechanism. From a horticultural point of view, this self regulating mechanism may be too strong or entirely insufficient. In particular, in the case of apple trees, varieties may display an abundance of fruitlets (Golden Delicious) or a limited number (classical Red Chief). In order to overcome these shortcomings bioregulators are currently used. However, while some products work efficiently on some varieties, spur red clones bearing may be difficult to control even by increasing bioregulators concentration. A more precise understanding of the molecular mechanism underlying natural fruitlet abscission would help in setting up more efficient control strategies. In this context Golden Delicious trees were assumed as study model. Fruitlet abscission is a highly coordinated event. It involves multiple changes leading to cell separation occurring in specific tissues designated as abscission zones (AZ). Ethylene and IAA regulate abscission. The general interaction between the two hormones is manifested in their antagonistic relationship, where the IAA status of the tissues controls their sensitivity to ethylene. On the other hand, ethylene is a potent inhibitor of IAA action, interfering with its polar transport. In this work the use of a chemical thinner such as benzyl amino purine (BA) was exploited to magnify the normal abscission tendency of lateral fruitlets and to study differences in terms of ethylene biosynthesis between abscissing and persisting fruitlets. Apple trees treated with BA bore lateral fruitlets producing higher amount of ethylene than central ones and displayed an increase in abscission reaching a level 13% higher than untreated trees. The use of 1-MCP nullified BA effect when applied 7 days after cytokinin application, indicating a lag phase between ethylene evolution and fruitlet shedding. Transcript accumulation of *MdACO* and *MdACS5B* increased along abscission in shedding fruitlets while remained at a basal level in non abscissing ones in seed, cortex, peduncle and AZ. Transcript accumulation of genes encoding ethylene receptors increased as well in abscissing fruitlets. The role played by ethylene in apple fruitlet abscission is discussed along with the involvement of the elements of the hormone transductive pathway.