

## Abstract

Responses of wild-type, *rin*, and *nor* tomato (*Lycopersicon esculentum* Mill.) fruit to exogenous ethylene and wounding were compared to identify the events directly controlled by each mutation. When *rin* and *nor* fruit were exposed to exogenous ethylene, respiration and accumulation of *E4*, *E8*, and *LE-ACO1* mRNAs increased to levels similar to those observed in the wild-type fruit, indicating that expression of these genes is independent of either mutations. In contrast, accumulation of *LE-ACS4* and *PG* mRNAs was not restored by exogenous ethylene treatment in both mutants, indicating that the expression of both genes requires both *RIN* and *NOR*. Interestingly accumulation of *LE-ACS2* mRNA was stimulated by ethylene treatment in *rin* fruit but not in *nor* fruit. This suggests that the signaling pathways of *RIN* and *NOR* affect the regulation of ripening-associated genes in distinct ways, at least with respect to the expression of *LE-ACS2*. Wounding induced ethylene biosynthesis and increased accumulation of *LE-ACS2*, *LE-ACS6*, *LE-ACO1*, and *E4* mRNAs in both wild-type and the mutants to the same extent. Treatment with 1-methylcyclopropene (1-MCP), a potent inhibitor of ethylene perception, preceding wounding, inhibited the increase of *E4* mRNA but did not affect the expression profile of other genes in all the lines tested. These results show that the wounding signal that controls *LE-ACS2*, *LE-ACS6*, and *LE-ACO1* is independent of *rin* and *nor* mutations and ethylene signaling.