

**Title** Physiological and molecular changes associated with prevention of woolliness in peach following pre-harvest application of gibberellic acid

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### Abstract

Peach [*Prunus persica* (L.) Batsch, cv. Chiripá] fruit harvested from plants sprayed with gibberellic acid (GA<sub>3</sub>), at the beginning (T1) and end of pit hardening (T2), kept under cold storage (CS) and controlled atmosphere (CA/CS), and from plants not sprayed with GA<sub>3</sub> (Control) and kept under CS, were evaluated in terms of fruit size and mass, ripening, occurrence of woolliness and expression of supposedly related genes and proteins. Peaches not sprayed with GA<sub>3</sub> and submitted to CS had a high incidence of woolliness, high mRNA abundance of vesicle transport genes and low mRNA abundance of genes associated with cell wall loosening, ethylene biosynthesis and heat shock proteins (*HSPs*). Early GA<sub>3</sub> spraying did not delay ripening but induced an increase in fruit size. In addition, it also induced a climacteric rise and prevented the occurrence of woolliness after CS. Woolliness prevention as a result of either GA<sub>3</sub> or CA/CS treatments resulted in higher abundance of mRNAs associated with cell wall metabolism, mitochondrial *HSPs* and 1-aminocyclopropane-1-carboxylic acid oxidase (*ACCO*). A unique GA<sub>3</sub> response consisted of a high mRNA abundance of genes and/or proteins such as *HSP40-1er*, *HSP40-2er*, *HSPCTR2*,  $\beta$ -mannosidase ( $\beta$ -*Man*) and  $\alpha$ -l-arabinofuranosidase ( $\alpha$ -*Ara*).