

RESPONSE MECHANISMS OF “HASS” AVOCADO TO SEQUENTIAL 1-METHYLCYCLOPROPENE APPLICATIONS AT DIFFERENT MATURITY STAGES DURING COLD STORAGE

Olivares, D.¹; García-Rojas, M.A.¹; Ulloa, P.A.¹; Riveros, A.²; Pedreschi, R.³; Campos-Vargas, R.⁴; Meneses, C.^{2,5,6}; Defilippi, B.G.^{1*}

1 Instituto de Investigaciones Agropecuarias, INIA-La Platina, Santa Rosa 11610, Santiago, Chile.

2 ANID—Millennium Science Initiative Program—Millennium Nucleus for the Development of Super Adaptable Plants (MN-SAP), Santiago, Chile.

3 Pontificia Universidad Católica de Valparaíso, Facultad de Ciencias Agronómicas y de los alimentos, La Palma, Quillota, Chile.

4 Universidad de Chile, Facultad de Agronomía, Santiago, Chile.

5 Pontificia Universidad Católica de Chile, Facultad de Agronomía e Ingeniería Forestal, Santiago, Chile.

6 Pontificia Universidad Católica de Chile, Facultad de Ciencias Biológicas. Santiago, Chile.

bdefilip@inia.cl

PALABRAS CLAVE: Ethylene, 1-MCP, RNA-seq, quality.

1-Methylcyclopropene (1-MCP) is used for extending the postharvest life of the avocado during storage. In this study, fruits from two maturity stages at harvest were used: low dry matter (20–23%) and high dry matter (27%), combined with 1-MCP at different times after harvest, *i.e.*, 0, 7, 14, and 21 d at 5 °C, to identify the threshold of the ethylene inhibition response in “Hass” avocado. Our results showed changes in ethylene production rates and transcript accumulation of genes involved in ethylene metabolism when measured at harvest and during storage. 1-MCP treated fruit up to 14 d of storage showed similar values of firmness and skin color as fruit treated at harvest time. In contrast, when the

application was performed after 21 d, the fruit showed ripening attributes like those of the untreated ones. We performed a transcriptomic analysis, to further understand the lack of response to 1-MCP at 21 d of storage. Results showed an increase of transcripts involved in the ‘response to ethylene’. All genes evaluated showed similar expression profiles induced by cold storage time, with a peak at 21 d of storage and an increased softening of the fruit and peel color. Our results should help to understand the molecular mechanisms of the avocado ripening process.