THE IMPORTANCE OF THE HARVISTA™ 1.3 SC PLANT GROWTH REGULATOR AT THE APPLE PRE-HARVEST STAGE

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Introduction. This paper investigates the pre-harvest application of the plant growth regulator 1-methylcyclopropene (1-MCP) in apple production. 1-MCP functions by blocking ethylene receptors, thereby delaying the ripening process and preventing premature fruit abscission. As apples mature, increased endogenous ethylene production triggers irreversible physiological changes affecting fruit color, texture, and aroma, while also elevating the risk of pre-harvest drop.

Material and Methods. The study aimed to determine the optimal timing for 1-MCP application to preserve fruit firmness, enhance cultivar-specific coloration, and minimize both pre-harvest fruit drop and watercore development. Research was conducted using literature analysis combined with experimental field data from the Champion apple cultivar treated with Harvista™ 1.3 SC (1-MCP) in a commercial orchard in the Republic of Moldova. Quality metrics were evaluated in accordance with international standards (ISO 2173, ISO 750, ISO 874) and the OECD Guidelines on Objective Tests for Determining Quality of Fruit and Vegetables.

Results and Discussion. Key quality parameters monitored included starch conversion index (1–10 scale, CTFEL), firmness (kg/cm²), soluble solids content (%), titratable acidity (%), surface coloration, and fruit size. Timely pre-harvest application of 1-MCP effectively suppressed ethylene production, resulting in enhanced retention of fruit firmness and titratable acidity alongside a significant reduction in fruit abscission. These findings demonstrate that pre-harvest 1-MCP treatment offers a sustainable practice for preserving fruit quality through both the pre-harvest and post- harvest phases.

Keywords: *apples, Champion cultivar, 1-methylcyclopropene (1-MCP), fruit firmness, pre-harvest drop, ethylene inhibition*