

Title Humidity and ethylene control during CA storage of 'Gala' apples

Author Auri Brackmann, Daniel Alexandre Neuwald, Josuel Alfredo Vilela Pinto and Anderson Weber

Citation Abstracts, 10th International Controlled & Modified Atmosphere Research Conference, 4-7 April 2009, Antalya, Turkey. 80 pages.

Keyword CA; ethylene; apple

Abstract

'Gala' and mutants are the most important apple varieties grown in Brazil. Part of the production is exported but the major part is stored under controlled atmosphere conditions for internal market. After long term storage occur losses due to internal breakdown and mealiness. Rapid loss of firmness and cracking of fruits also occur, especially during shelf-life period. One experiment were carried out to evaluate the effect of the humidity in storage room and other three experiments evaluated the effect of pre-harvest AVG application as well as the post-harvest treatment with 1-MCP and removal of ethylene from storage ambient. In all experiments apples were stored during 8 month in CA with 1.2kPa O₂ and 2.5kPa CO₂ at 0.5°C. In one experiment temperatures of 0.5 and -0.5°C were used. Result showed that high humidity (95%) increase ethylene production which hastened the ripening process, increasing loss of firmness, mealiness, internal breakdown and decay. Low humidity levels (90%), which increase weight loss, reduced significantly losses. In low humidity, the loss of 1.6% of weight reduced mealiness and decay, but 3.0% weight loss was necessary to control breakdown. Control of ethylene synthesis with AVG and ethylene action with 1-MCP and ethylene removal retarded ripening and therefore maintained higher firmness. AVG and ethylene removal were the most effective treatments in the control of firmness loss, and the combination of both treatments showed the best result. Only AVG controlled partially rot incidence. Low Internal breakdown was observed in fruit treated with AVG and with ethylene absorption during storage. 1-MCP, in contrast, did not control internal breakdown during long term storage. Firmness was higher and breakdown was lower at the temperature of 0.5°C in comparison to -0.5°C. In summary, 'Gala' apples maintained the best quality after 8 months CA storage (1.2kPa O₂ and 2.5kPa CO₂) at 0.5°C, with pre-harvest treatment with AVG and post-harvest ethylene absorption combined with moderate humidity (90-92%), which permit the loss around 3% of the fruit weight.