

Annotation

Melnyk O.V., Drozd O.O., Melnyk I.O.

Changing the physical parameters of Golden Delicious apples treated with ethylene inhibitor after harvest, depending on the type of orchard and harvest date

Time of harvest is a major factor that determines the quality of apples during prolonged refrigeration storage. Fruits picked too early have no flavor and are insufficiently colored however if harvested too late – they tend to fruit rot lesions and physiological disorders during storage. The fruit quality is also determined by the design (type) of the orchard and growing season weather conditions.

Flesh firmness is the main criterion for assessing the quality of apples during the sale because the products come to markets with an index of at least 4.5–6.0 kg/cm². In conditions of high ambient temperature the firmness decreases faster, so before shipment from the refrigerator an indicator must be 1.0 kg/cm² higher than recommended for distribution. The ground color of apple skin during storage changes from green to yellow that is characterized by an index of reflection on the wave of light absorption by chlorophyll.

Keeping firmness and delaying ripening of apples and thus slowing the changes of ground skin color during the storage of the output from orchards with different designs is provided by postharvest treatment of ethylene inhibitor 1-methylcyclopropene (1-MCP).

The change of flesh firmness and ground color (as a reflection of light) of Golden Delicious apples harvested in two periods - with the onset of harvest maturity (mass picking) and a week later (late pick) – from intensive orchard on dwarf (M.9) rootstock and a traditional one, on semi-vigorous (MM.106) rootstocks was studied. The fruits were cooled to 5 °C and then treated with 1-MCP and preserved to seven months at a temperature of 2±1 °C and relative humidity 85–90 % (no treatment - control).

The ground color of the skin was determined with help of spectrophotometer «Spekol» by the reflection of light on the typical wave 675 nm of chlorophyll absorption, and the flesh firmness – by penetrometer FT–327 with plunger diameter 11 mm (a peel was cut before the measurement).

It was found out that the best preservation of flesh firmness was typical for the apples from intensive orchard. Postharvest treatment of 1-MCP provides 1.2 times higher firmness of fruit from both types of orchards (at the end of seven-month storage). The index of apples from intensive orchard, unprocessed fruit of mass collection (and treated with 1-MCP fruits from traditional orchard) were on 0.1–1.5 kg/cm² higher than the minimum of 5.5 kg/cm², which is necessary for supply to supermarkets.

After seven-month storage, the reflection of light from the fruit skin on a wave of chlorophyll absorption was lower for the produce of traditional orchard, regardless of the harvest term. With the use of post-harvest treatment of 1-MCP, the level of this indicator was by 8 % lower only for the fruit of mass harvesting from intensive orchard.

Key words: *Golden Delicious, 1-Methylcyclopropene, Smart Fresh, rootstock, harvest date, storage, flesh firmness, reflection of light*