B-114: Studies on calcium treatment on Embul bananas

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Mature green Embul bananas were treated as follows: dipping different batches of fruits using 2, 4, 6 and 8% calcium chloride respectively for 20 min; pressure infiltration of a 4% $CaCl_2$ solution (at 4.3×10^{-3} kg m^{-2}) for 2-3 min; vacuum infiltration (at 250 mm Hg) of 4% $CaCl_2$ solution for 2-3 min. One set was pressure infiltrated at 5° C. All treated fruits were held under ambient conditions, and daily disease and colour changes noted. For another batch preharvest $CaCl_2$ (1%) was sprayed, twice every week for 13 weeks.

None of these affected ripening and disease although $CaCl_2$, is said to improve postharvest attributes of other fruits. It is reported that the importance of calcium in disease resistance is the result of the tight binding of calcium ions to pectin present in cell walls forming cation cross bridges between mainly pectic acids.

An explanation for the negative results was sought as follows: 6 bananas of similar surface areas were immersed separately in proportionally equal amounts of water to the volume of each fruit (ca. 300ml), after treatments. The conductivity after 24 h, of water in which bananas were immersed were 5.3±0.1, 5.6±0.2 and 5.2±0.3 for untreated, treated with water, and treated with 4% $CaCl_2$ respectively.

These leakage experiments indicated that infiltrated calcium may be localizing in apoplast and diffusing out passively without participating in calcium bridging. The natural levels of calcium (determined by atomic absorption spectroscopy) in peel and pulp of mature green fruit (one sample in each) were 261.9 ppm and 18.9 ppm, which decreased progressively during ripening to 203.4 ppm in peel and increased up to 28.8 ppm in pulp.

Research grant (No.2110-E)from IFS, Sweden is acknowledged.