Title Packaging material and ripening methods affect mango fruit quality

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Abstract

These studies were conducted on two major postharvest issues of local mango industry. Firstly; more than 90% mangoes are packed in wooden crates, which are being eliminated in export markets. Secondly, calcium carbide (CaC2) is mostly used for ripening of mango fruit; while, its use is being discouraged worldwide, due to associated health hazards. To find out some better alternatives, two experiments were conducted on commercial mango cv. Samar Bahisht Chaunsa. In both experiments, fruits were packed in traditional wood packaging with newspaper liner (WP) and corrugated cardboard packaging (CBP) for comparison. In first experiment, CaC2 (2g per kg of fruit) was used for ripening of mangoes in comparison with ethylene (C2H4) application (100 Pm, 20 degree C, 48 h), followed by ripening at ambient conditions (33 plus minus 1 degree C & 60-65% RH). CBP fruit showed significantly lower fresh fruit weight loss (FWL) and better shelf life compared with WP fruit treated with or without CaC2. WP fruit treated with CaC2 had faster ripening rate and better peel colour development compared with C2H4 treated CBP. In second experiment, WP or CBP fruit were stored (13 plus minus 1 degree C & 85-90% RH) for 15 days, followed by natural ripening at two different temperatures (28, 33 plus minus 1 degree C). Performance of C2H4 (100 Pm, 48 h) at 25 degree C and 30 degree C was also evaluated in CBP fruit. Regardless of ripening temperatures and methods, CBP significantly reduced FWL compared with WP. C2H4 treatment at higher temperature (30 degree C) significantly improved quality (total soluble solids & sugars) compared with application at low temperature (25 degree), however, the fruit colour was not developed to the desired level. In conclusion, CBP can be substituted for WP due to its demonstrated benefits; however, further studies are needed to develop precise ripening protocol using ethylene at different concentrations and temperature regimes, for improving colour and fruit quality under ambient or post-storage conditions.