

Title Postharvest quality of specialty bananas after irradiation for quarantine security
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Abstract

Fruit quality and ripening of 'Dwarf Brazilian' ("apple") bananas were determined following x-ray irradiation for disinfestation of quarantine pests. The USDA-approved minimum absorbed dosage for banana exports from Hawaii is either 400 Gy with inspection for the presence of banana moth, or 150 Gy with inspection for banana moth and green scale. However, fruit radiotolerance limits had to be established for the treatments to be commercially adopted. The proximal (more mature) and distal (less mature) hands from winter- and summer-harvested bunches were treated with irradiation doses of 0, 200, 400, 600, or 800 Gy, stored for 7 days at 14 °C, and ripened at 20°C. Irradiation did not extend banana shelf-life or affect soluble solids content, but titratable acidity decreased with increasing dose. Starch and total sugar concentrations were similar for control and irradiated fruit at all doses, but sucrose hydrolysis to glucose and fructose was accelerated in treated bananas. Irradiation retarded peel softening but not pulp softening for winter-harvested fruit, and had a minimal effect on peel and pulp firmness of summer-harvested fruit. Bananas from distal hands treated with an irradiation dose of 800 Gy developed peel injury when harvested in either the winter or summer months. Summer-harvested fruit also were damaged at the 600 Gy dose for distal fruit only. Treatment of fruit from the proximal half of bunches at doses < 600 Gy would ensure visual quality while providing quarantine security for 'Dwarf Brazilian' bananas.