

Integrated disease control strategies for lengthening the storage life of papaya cultivars 'Red Lady' and 'Rathna'

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Acta Horticulturae 975: 167-172. 2013..

Abstract

Anthraxnose (*Colletotrichum gloeosporioides*), stem-end rot (*Phomopsis caricae-papayae* and *Lasiodiplodia theobromae*), and Phomopsis rot of papaya are major diseases resulting in relatively high post-harvest losses (up to 45%) in Sri Lanka. Current consumer preference is for tropical fruits free of agrochemicals. The objectives of the present investigation were to identify the in vitro efficacy of basil oil (*Ocimum basilicum*) and alum (sodium aluminium sulphate) on fungal pathogens of papaya fruit and to develop a relatively safe, in vivo integrated disease control strategy. Alum (1% (w/v)) and basil oil (0.12-0.16% (v/v)) in a liquid bioassay, indicated fungistatic and fungicidal efficacy on *Colletotrichum gloeosporioides*, *Lasiodiplodia theobromae* and *Phomopsis caricae-papayae* isolated from 'Red Lady' and 'Rathna' cultivars of papaya. In vivo investigation of fruits of both cultivars harvested from orchards in Sri Lanka at 25% maturity level indicated that papaya washed in 1% (w/v) alum and subsequently sprayed with an emulsion solution of 0.16% (v/v) basil oil and enclosed in styrofoam sleeves could be stored for a period of 14 days at 12-14°C. The visual quality rating (VQR) was high (11-13), and shriveling and "green islands" were low on fruits with zero disease severity where results were statistically similar to a Bavistin 500 mg/L (systemic fungicide) treatment. Physico-chemical properties assessed were unaffected by the treatments and were comparable to the control (washed only in water). The organoleptic properties were slightly low in fruits subjected to cold temperature compared to fruits subjected to ambient temperature. No residues of basil oil could be detected on fruits by gas chromatography at the end of the experimental period. This integrated treatment strategy of papaya could be adopted for sea shipment and temperature-regulated supermarket storage of papaya fruits where storage life could be lengthened by up to 14 days.