

Abstract:

The use of chemical fungicides for postharvest disease control is under pressure due to both fungal resistance potential as well as the consumer wishing to purchase fungicide-free fruit. Alternative biological control methods have not provided acceptable commercial control. Citrus fruit contain antifungal compounds which decrease in the rind after colour break. The decrease is more rapid in some orchards than others, leading to increased waste. The objective of the work was to investigate the potential to enhance antifungal compounds preharvest, and combine this approach with biological postharvest control measures plus risk management through development of a prediction technique for postharvest decay potential. Spray application of phosphorous acid and a commercial phytoalexin-enhancing compound within two weeks of harvest did increase antifungal characteristics of the fruit. Neither this nor postharvest application of *Cryptococcus albidus* alone were able to adequately control growth of *Penicillium digitatum* in fruit inoculated with 10⁶ spores per ml. In combination, however, commercial control could be achieved. A technique for risk potential was developed by separating components of a rind extract by thin layer chromatography, spraying the plate with *P. digitatum* and observing fungal growth inhibition in the zone of antifungal compounds. It is concluded that the use of an integrated approach to decay management can potentially replace chemical fungicides for citrus decay management.