

Title Effect of B-cyclodextrin-thiabendazolepiperonyl butoxide supramolecular complex on control of postharvest blue and green mould decay inoculated citrus fruit

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Abstract

Piperonyl butoxide (PBO), widely known as an insecticide and herbicide synergist, blocks metabolic detoxification mediated by cytochrome P450 monooxygenases. PBO also increased the effectiveness of the anilinopyrimidine cyprodinil but had controversial effects on triazoles by either increasing or decreasing their antifungal properties. The influence of postharvest 2-min dip treatments at 20 or 50 °C with a supramolecular complex of b-cyclodextrin-thiabendazole- piperonyl butoxide (bCD-TBZ-PBO) or Thiabendazole (TBZ) was compared for controlling postharvest decay on artificially inoculated 'Okitsu' Satsuma fruits caused by blue mould (*Penicillium italicum*) and green mould (*P. digitatum*). Water dip at 20 °C did not affect the incidence of lesions caused by blue mould but favoured the development of green mould during 4–8 days of storage at 20 °C with respect to untreated fruit. While water at 50 °C effectively reduced the incidence of blue mould and totally suppressed green mould during the first 4 days, its efficacy notably declined or was lost afterwards. By contrast both TBZ and bCD-TBZ/PBO had a lasting effect and were equally effective in controlling green and blue mould decay when applied at 20 °C and 60 mg/l active ingredient (a.i.); whereas at 50 °C and 20 mg/l a.i. the activity of bCD-TBZ/PBO against blue mould was lower than that of TBZ. It is possible that the co-application of a proper adjuvant may enhance the activity and/or performance of bCD-TBZ/PBO by lowering the surface tension and allowing better spreading of the mixture.